The Highland Council
Comhairle na Gàidhealtachd

Corran Ferry
Infrastructure Improvement Scheme

Environmental Impact Assessment Report
Volume 3
Appendices
February 2025

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AFFric
Wallace Stone
Consulting Civil Engineers

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Corran Ferry Infrastructure Improvement Scheme

Appendix A.1: The Environmental Impact Assessment Team

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1 Introduction

Affric Limited (hereafter 'Affric') have led the Environmental Impact Assessment Report (EIAR) production for the Corran Ferry Infrastructure Improvement Scheme (CFIIS). Senior Environmental Consultant Claire Williams has co-ordinated and managed the process, however it has been a team effort. Affric have worked closely with the client, The Highland Council (THC), their engineers (Wallace Stone LLP) and with a variety of consultants to ensure that appropriate experts have contributed relevant technical input to the assessment. Table A.1 details the lead authors for each of the chapters. Further information with regard to the experience and expertise of the various companies and personnel involved in the production of the EIAR is provided in Section 2.

Section 3 provides details on others who contributed to the Environmental Impact Assessment (EIA) process, while Section 4 introduces the design team who have worked with the EIA team to design out environmental concerns.

Table A.1: Authors

Chapter	Author(s)
1: Introduction	Affric Limited (Claire Williams)
2: Project Description	Affric Limited (Claire Williams and Fiona Henderson)
3: Methodology	Affric Limited (Jamie Maxwell and Claire Williams)
4: Legislation and Policy	Affric Limited (Daisy Hodge and Fiona Henderson)
5: Landscape and Visual	Atmos Consulting
6: In Air Noise and Vibration	TNEI Services Limited
7: Underwater Noise	SubAcoustech Environmental Limited
8: Air Quality	Affric Limited (Daisy Hodge)
9: Coastal Processes and Flooding	Affric Limited (Jamie Maxwell)
10: Biodiversity	Affric Limited (Fiona Henderson and Claire Diffin)
11: Terrestrial Ecology and Ornithology	Affric Limited (Ffion Maguire and Hamish Baker)
12: Marine Mammals	Affric Limited (Kirsty Macdonald and Claire Diffin)
13: Fish and Shellfish Ecology	Affric Limited (Kirsty Macdonald)
14: Benthic Ecology	Ocean Ecology Limited
15: Archaeology and Cultural Heritage	AOC Archaeology Group
16: Traffic, Transport and Access	Pell Frischmann
17: Navigation	Affric Limited (Claire Williams)

Chapter	Author(s)
18: Socio-economics	Affric Limited (Claire Williams)
19: Materials and Waste	Affric Limited (Jamie Maxwell)
20: Climate Change	Affric Limited (Jamie Maxwell)
21: Schedule of Mitigation	Affric Limited (Daisy Hodge)
22: Conclusion	Affric Limited (Daisy Hodge)

2 EIA Authoring Team

2.1 Affric Limited

Established in 2012, Affric are a growing and highly responsive environmental consultancy business providing a comprehensive range of environmental advice, surveys, planning support, stakeholder and project management services. With a broad and expanding portfolio of clients, they work on a diverse range of projects in the public and private sector from small and midsize enterprises to global energy companies. Affric work with their clients to provide high quality tailored services, ensuring that any given project has the most appropriate expertise, irrespective of sector or region.

Chartered Environmentalist Fiona Henderson leads the Affric team as Managing Director with qualifications including a MSc in EIA, Auditing and Management Systems and BSc (Hons) in Environmental Chemistry. Her background in nuclear safety cases has given her a unique understanding of risk identification and management. Due to her vast experience, particularly in EIA, Fiona has supported the development of this EIA as Project Director for Affric's contributions to the project, contributing to the production of various chapters through the EIAR.

Senior Environmental Consultant Claire Williams has 8 years of experience managing projects and compliance as an environmental professional. Her prior knowledge of public exhibitions, online consultation webinars and targeted stakeholder engagement, gives her a breadth of understanding of consultation and socio-economic considerations for large projects. This experience made her very well suited to co-ordinating the EIA, leading the pre-application consultation process and contributing to many of the EIAR chapters including Chapter 1: Introduction, Chapter 2: Project Description, Chapter 3: Methodology, Chapter 17: Navigation and Chapter 18: Socio-economics.

Kirsty Macdonald is a Senior Environmental Consultant with 10 years' experience in the industry, with a BSc in Marine Biology and professional experience as a Marine Mammal Observer (MMO). Most recently, she has authored content on marine mammal, fish, and benthic ecology assessments for scoping reports and EIARs for large harbour developments. Consequently, Kirsty was expertly placed to provide support to multiple chapters of the EIAR, including authoring Chapter 12: Marine Mammals and Chapter 13: Fish and Shellfish Ecology.

Ffion Maguire is a Senior Ecological and Arboricultural Consultant with a BSc (Hons) in Zoology and a Master of Research (MRes) in Bioscience. Ffion has a wealth of experience in writing terrestrial ecology and ornithology EIA screening and scoping sections and has recently authored an ornithology chapter for a large harbour development EIAR. Hence, she was an ideal candidate to author Chapter 11: Terrestrial Ecology and Ornithology.

Dr Jamie Maxwell is a Senior Environmental Consultant and has contributed to EIARs, groundwater monitoring plans and Construction Environmental Management Plans. His qualifications include a BSc (Hons) in Environmental Geoscience, an MScR in Palaeoceanography, and a PhD in Oceans and Climate. Jamie's academic background means his work is of a high calibre and, as such, he has contributed to and authored chapters including Chapter 3: Methodology, Chapter 9: Coastal Processes and Flooding, Chapter 19: Materials and Waste and Chapter 20: Climate Change.

Sophie Fallon is a Senior Environmental Consultant with 18 years' experience in the industry. Sophie has contributed to EIARs, authored several chapters for EIA screening and scoping opinion requests, focussing on water management, socio-economic and human health aspects. Her qualifications include a MSc in Water Management. Given her vast experience, she was well suited for contributing to and supporting various chapters of the EIAR, in particular the terrestrial ecology and ornithology chapter.

Daisy Hodge is an Environmental Consultant, providing advice on ecological risks and environmental management. Her qualifications include an MA (Hons) in Geography, an MSc in Environmental Management and Conservation and experience as an MMO. Daisy has been a contributor to the CFIIS EIAR, namely authoring Chapter 8: Air Quality and co-author to Chapter 4**:** Legislation and Policy.

Graduate Environmental Consultant Claire Diffin has a BSc (Hons) in Biology and an MSc in Marine Biology. She has an MMO certification, past experience with the Irish Whale and Dolphin Group and a previous role as the Research Assistant and Intern Co-ordinator for the cetacean monitoring unit SeaWatch Foundation. Claire provided her knowledge and experience through contributions to Chapter 10: Biodiversity, Chapter 12: Marine Mammals and Chapter 13: Fish Ecology were very valuable.

Hamish Baker is a Graduate Environmental Consultant with a professional background in bird surveying around Scotland. He holds a BSc (Hons) in Marine Biology, with a focus on ornithology, making him a valuable asset in contributing to Chapter 11: Terrestrial Ecology and Ornithology.

2.2 Atmos Consulting

Atmos Consulting (hereafter, 'Atmos') are a modern and dynamic environmental and planning consultancy, providing cost effective and robust solutions with high integrity. Chapter 5: Landscape and Visual was produced through a collaboration of Atmos Consulting and Hermitage Environmental Planning and Landscape Architecture Limited (HEPLA).

Technical Director Tom Hartly has experience producing visualisations and Landscape and Visual Impact Assessment (LVIA) figure sets, and managed LVIA input for various EIA developments. Tom was the client contact and managed collection of landscape photography, 3D/visibility modelling and photomontage production via the Atmos Geographical Information System team.

HEPLA is led by Peter Dunmow an experienced Chartered Landscape Architect, LVIA Specialist, and Master planner. Peter has 29 years of experience in Landscape Architecture and Urban Design. His experience covers the full breadth of landscape consultancy services, managing and working on a wide range of projects throughout the United Kingdom (UK) and overseas. He is an experienced landscape practitioner, specialising in LVIA. Peter's decades of experience have been vital in producing Chapter 5: Landscape and Visual, for which he had responsibility over.

In addition to contributing directly to the EIAR Chapter 5: Landscape and Visual, Atmos' ecological team completed a breeding bird survey for the CFIIS site, for which the report is provided as Appendix K.2.

2.3 AOC Archaeology Group

AOC Archaeology Group (hereafter referred to as 'AOC') is one of the most experienced heritage companies in Britain. They are a Registered Archaeological Organisation through the Chartered Institute for Archaeologists (CIfA), meaning all work is conducted to high quality standards and in compliance with codes of practice of the CIfA. The consultancy team are acknowledged as being a lead in developing methodologies for setting cultural heritage assessments, undertaking hundreds of them each year.

AOC contributed to the EIAR by producing Chapter 15: Archaeology and Cultural Heritage. The assessment has been carried out by Mark Littlewood. Mark is a Project Officer and an Associate of the Chartered Institute for Archaeologists. Mark joined AOC in 2017 after spending seven years working for ORCA Marine at the University of the Highlands and Islands. A trained maritime archaeologist and naval historian, Mark is experienced in producing marine Desk Based Assessments (DBAs), EIAs and Environmental Statements for a range of clients and development types, in-depth experience of marine geophysical processing and assessment, underwater surveys using divers and remotely operated vehicles and undertaking naval and historic research in national and local archives.

The assessment has been overseen by Lynne Roy. Lynne Roy is a Consultancy Project Manager and a Member of the CIfA with over 18 years' experience working on cultural heritage assessments. Lynne specialises in EIAs and has managed and produced the EIA Report chapters for over 40 windfarm schemes in Britain as well as numerous solar farms and large-scale urban projects.

AOC has a wide range of specialities which made them well enlisted to oversee the archaeology and cultural history component of this project. With Lynne's experience in EIA writing and Mark's focus on the region and marine environment respectively, Chapter 15: Archaeology and Cultural Heritage was produced to a high level.

2.4 Ocean Ecology Limited

Ocean Ecology is a marine ecological consultancy that specialises in providing marine ecological surveys, analysis and consultancy services to feed into regional and national monitoring programmes, as well as EIARs. Their survey capabilities range from seabed imagery collection using drop down/towed camera systems, grab sampling, trawling and plankton sampling as well as surveying of the intertidal zone via hovercrafts and Unmanned Aerial Vehicles, each of which have been performed for various port, harbour and marina projects throughout the UK.

Ocean Ecology operate a leading NMBAQC participating laboratory offering a variety of analysis services undertaken in-house including macrofaunal and meiofaunal analysis and particle size distribution analysis. Their technical specialists are regarded as experts on a variety of subjects including seabed imagery analysis and interpretation, EUNIS biotope classification, Annex I reef habitats, the design of site characterisation and monitoring surveys and the development of Environmental Management Plans. As such, their technical specialists sit on a number of Expert Topic Groups for some of the UK's largest Nationally Significant Infrastructure Projects, provide expert advice to regulatory bodies through a number of advisory frameworks and frequently provide specialist workshops on a variety of marine ecological subjects.

With their expertise, Ocean Ecology contributed to the EIAR by undertaking the subtidal and intertidal benthic ecology surveys and analysis, producing benthic habitat maps and producing Chapter 14: Benthic Ecology.

2.5 Pell Frischmann

Pell Frischmann is a specialist advisory and technical consultancy operating across the built and natural environment, helping to shape a better future for the communities in which they work. Pell Frischmann's Transport Planning experience has been developed over four decades, providing consultancy services across the breadth of the Buildings, Highways and Transportation and Land Development sectors. The Pell Frischman team is well-versed in delivering multi-disciplinary projects, providing policy advice, transport modelling, demand analysis, economic appraisal and developing business cases, engineering design, operations, management, training, safety and research. As such, their breadth of experience has them well-placed for input into the CFIIS EIAR, namely the Transport Assessment for the scheme and authoring Chapter 16: Traffic, Transport and Access.

2.6 Subacoustech Environmental Limited

Originally founded in 1993, by Dr Jeremy Nedwell, Subacoustech Environmental Limited (hereafter 'Subacoustech Environmental') was the UK's first specialist underwater acoustic consultancy undertaking all forms of civil and defence related marine acoustics projects. In 2008, Subacoustech Environmental was formed to address the specific issues and uncertainties around the environmental effects of underwater noise from the emerging offshore renewables sector alongside other marine construction projects.

Since that time, Subacoustech Environmental has contributed baseline underwater noise monitoring and predictive modelling assessments to EIAs for numerous marine development projects around the world - including the majority of offshore wind farms in the UK.

For over 25 years, Subacoustech Environmental has been building a growing library of fully calibrated and documented underwater noise measurements from activities such as piling, blasting, dredging, drilling, shipping and other noise sources. They routinely use these measurements to validate and improve their modelling estimates, and provide increased confidence in the results, adding value to their assessments. Subacoustech Environmental applied their expertise to the underwater noise modelling the production of Chapter 7: Underwater Noise.

2.7 TNEI Services Limited

TNEI's Planning and Environmental Group provide a range of commercially focused consenting, technical and environmental services critical to the delivery of new development projects in the energy and infrastructure sectors. Their noise team are competent in a range of acoustic disciplines with specialist knowledge of environmental noise assessments in a wide variety of sectors including transportation and renewable energy developments.

The team was led by Jim Singleton, a Specialist Consultant, with a BSc (Hons) in Music Technology and full membership of the Institute of Acoustics (IOA). Jim specialises in construction noise assessment, which has taken him across the UK and Ireland. This prior experience of the site and breadth of knowledge in the sector made Jim well positioned to lead the team and oversee their contribution to the CFIIS EIA.

Mathew Robinson is a Technical Consultant with a BEng in Mechanical Engineering and a MSc in Advanced Materials Science and Engineering, and he is also a technician member of the IOA. Mathew contributed to the EIAR through the writing and noise modelling in Chapter 6: In-air Noise and Vibration.

3 EIA Support

3.1 The Highland Council

The client team of THC have supported the CFIIS EIA, not just through provided client review support to the EIAR, but throughout the assessment and reporting process. The CFIIS team including:

- Andrew Maciver – Principal Engineer and Contract Service Manager;
- Garry Smith – Infrastructure Service Manager;
- Murray Bain – Corran Ferry Project Manager; and
- Richard Porteous – Corran Ferry Operations Manager,

have shared their various skills and expertise to the project development, including contributions throughout the pre-application consultation process.

3.2 Wallace Stone LLP

Wallace Stone have provided engineering and project management support to the CFIIS throughout the project. Further details on Wallace Stone contributions are described in Section 4.1.

3.3 Harris Holden Limited

Harris Holden specialises in providing environmental consultancy services to ports and harbours and the marine renewable energy sector. Katherine (Harris) Holmes, Director of Harris Holden, is a Chartered Environmentalist with 20 years' experience in the marine and coastal environmental sector. From her work as environment manager for a UK major port and as a Principal EIA Consultant, she has developed a comprehensive understanding of the UK environmental legislative framework. For these reasons, Katherine was taken on as a reviewer for the EIAR.

3.4 RPS Consulting Group

RPS Consulting Group (hereafter 'RPS') engineers, environmental scientists and infrastructure specialists have vast experience in water management, flooding and potential changes to wave climate, tidal regimes and coastal flooding processes as a result of infrastructure design.

RPS's Technical Director for Water Environment and Flood Risk Management, Adrian Bell BSc CEng FIAE FIEI MICE MIStructE led their input to the EIAR. RPS conducted hydraulic modelling and assessments, the reports of which were used to inform Chapter 9: Coastal Processes and Flooding. Hydraulic and Todal Current Profiling Reports are provided as Appendices I.2 and I.3.

3.5 Tracks Ecology

Tracks Ecology is led by James Bunyan who is full member of the Chartered Institute for Ecology and Environmental Management. James has over 15 years ecological experience, working within both the academic and commercial consultancy sectors, on a wide range of research and development projects requiring Ecological Impact Assessments and high quality ecological surveys.

James' expertise is centred on protected species survey, initial baseline assessments and management including bats, badgers, great crested newts, otter, water vole and reptiles. He also holds NatureScot 'survey' licences for bats and great crested newts. He has extensive experience and skills in impact assessment, mitigation, habitat management and enhancement strategies.

James provided technical input to, and co-authored, the CFIIS Bat Survey Report (Appendix K.3).

3.6 Anderson Marine Surveys Limited

Anderson Marine Surveys Limited (hereafter 'Anderson Marine') was established in 1998, and design, manage and undertake inshore marine surveys and related EIA and modelling studies. Stuart Anderson, of Anderson Marine has a broad experience in marine impact assessment with particular expertise in dispersion modelling for coastal and freshwater discharges. Additionally, Stuart has extensive experience in developing collaborative studies with academic and research institutes. Stuart provided valuable input to Chapter 18: Socio-economics.

3.7 ABPmer

With over 70 years of port and harbour consultancy experience ABPmer provide an independent marine consultancy service with a depth of knowledge. ABPmer has a wide experience of port and harbour operations, ship handling and navigation. This experience comes partly from their unique position as part of the Associated Bristin Ports (ABP) Group, giving first-hand experience of running ports from small harbours to large port facilities.

ABPmer facilitated the Hazard Identification Workshop and prepared the Navigational Risk Assessment which is referred to throughout Chapter 17: Navigation as Appendix Q.1.

3.8 Nick Hodgetts Botanical Services

Nick Hodgetts is an experienced botanist with a specialism for bryophytes and over 40 years' experience working on British and Irish flora. Nick Hodgetts produced the Corran Woodland Ecological Survey (Appendix K.6) which was used to inform the assessments in Chapter 11: Terrestrial Ecology and Ornithology.

3.9 ROAVR

ROAVR carry out ecology, tree, protected species surveys and biodiversity net gain assessments to support planning applications in all local authority areas UK wide. With their extensive arboricultural expertise, ROAVR conducted onsite tree surveys and provided the Arboricultural Impact Assessment, Method Statement and associated plans. These are included as Appendix K.7.

3.10 ERS

Established in 1994, ERS is a multidisciplinary contractor with a mix of scientific and engineering expertise. ERS' highly experienced in-house team of invasive weeds specialist were able to provide support to the EIAR authoring the initial Integrated Weed Management Plan included as Appendix K.8.

4 Design Team

4.1 Wallace Stone LLP

Wallace Stone is a maritime civil engineering consultancy and a member of the Association for Consultancy and Engineering. Based in Scotland, they are committed to providing a full range of in-house professional services to the projects on which they are engaged. Their areas of expertise include marine structures design, including harbours, piers, jetties, and slipways; coastal protection work including breakwaters and causeways design; piling, fendering and mooring systems; dredge works; berthing facilities including pontoons; and bridge work. They were awarded 'Best Overall Project Award' in 2024 at the Scottish Civil Engineering Awards for the Ullapool Shore Street and Inner Harbour Improvements Project and 'Marine Infrastructure Award' in 2024 and 2022 for the Lochmaddy and Tarbert (Harris) Ferry Terminal Upgrades, respectively, highlighting the expertise this company offers.

Wallace Stone provided engineering and project management support to the CFIIS. Barry Purcell (BEng CEng MICE) is a partner at Wallace Stone and CFIIS lead for the Wallace Stone design team. Wallace Stone have prepared various technical reports, designs, assessments and drawings used to inform the proposal and EIAR. Appendix B.1 CFIIS Equality Impact Assessment and Appendix I.1 Flood Risk Assessment and Drainage Risk Assessment were developed by the Wallace Stone team.

With the wealth of experience offered by Wallace Stone's project team, this design work has been completed to a high standard.

4.2 Matheson Mackenzie Ross

Led by Neil Ross (RIBA RIAS), Matheson MacKenzie Ross (MMR) Architects have been working as part of the project team to deliver high quality designs for the building elements required for the CFIIS. MMR Architects specialise in new housing, listed building refurbishments and commercial buildings within the Highland region.

Relevant ferry terminal experience includes the design of the Ullapool and Tarbert (Harris) ferry terminal buildings. For the CFIIS, they have been working as part of the design team to develop proposals for the Nether Lochaber toilet facilities.

5 Glossary

Acronym	Definition
ABP	Associated Bristin Ports
CFIIS	Corran Ferry Infrastructure Improvement Scheme
CIfA	The Chartered Institute for Archaeologists
DBAs	Desk Based Assessments
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
HEPLA	Hermitage Environmental Planning and Landscape Architecture Limited
IOA	Institute of Acoustics
LVIA	Landscape and Visual Assessment
MMO	Marine Mammal Observer
MMR	Matheson MacKenzie Ross
MRes	Master of Research
UK	United Kingdom

Corran Ferry Infrastructure Improvement Scheme

Appendix B.1: Equality Impact Assessment

Wallace Stone
Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

THE HIGHLAND COUNCIL

CORRAN FERRY INFRASTRUCTURE IMPROVEMENT SCHEME

EQUALITY IMPACT ASSESSMENT

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THE HIGHLAND COUNCIL
CORRAN FERRY INFRASTRUCTURE IMPROVEMENT SCHEME

EQUALITY IMPACT ASSESSMENT

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THE HIGHLAND COUNCIL
CORRAN FERRY INFRASTRUCTURE IMPROVEMENT SCHEME

EQUALITY IMPACT ASSESSMENT

1. Introduction

1.1 General

The Corran ferry service is a critical transport link which operates between the communities of Ardgour, on the West shore of Loch Linnhe and Nether Lochaber on the East shore. The Highland Council (THC) are working collaboratively with Caledonian Maritime Assets Ltd (CMAL) and Transport Scotland (TS) to improve the infrastructure for the Corran ferry crossing to facilitate the introduction of a New Electric Vessel (NEV) as part of the Corran Ferry Infrastructre Improvement Scheme (CFIIS).

The project includes the provision of new slipways, a new breakwater and alignment structure, overnight berthing structure, new marshalling area, and new crew and ferry user facilities.

The Equality Act 2010 mandates that public bodies, including those involved in infrastructure projects have a duty to promote equality and eliminate discrimination in relation to the nine protected characteristic groups. This Equality Impact Assessment (EQIA) has been completed by Wallace Stone (WS) on behalf of the Client (THC) to support the consenting process for the improvement works and identify the actions taken to ensure the project does not present barriers to use of the infrastructure and facilities or disadvantage any protected groups.

The EQIA is structured to assess the potential negative impacts of the proposed infrastructure design with regard to equal access for each of the characteristic groups and identify the mitigating actions that have been developed to address any negative impacts, where reasonably practicable. The information is presented within an equality impact matrix for both sides of the crossing: Nether Lochaber and Ardgour.

Characteristic groups are defined under the Equality Act 2010 as follows:

- Age;

- Disability;
- Gender Reassignment;
- Marriage or Civil Partnership;
- Pregnancy and Maternity;
- Race;
- Religion or Belief;
- Sex (Gender); and
- Sexual Orientation.

1.2 Constraints

Throughout the design development, the project has aimed to minimise the negative impacts on equality and ensure equal access is provided as far as reasonably practicable. However, due to inherent design constraints and operational requirements, equal access to all infrastructure elements cannot be fully achieved. Specific key parameters such as the sites tidal range and vessel interface arrangement with the slipway and overnight structure play a critical role in determining the functionality and safety of the infrastructure.

Tidal levels and vessel interface requirements, such as the location and alignment of boarding points, via the slipway, must prioritise compatibility with maritime operations, which results in restricted accessibility for some users. The 'Loch Class' vessels proposed for the new slipway are designed on the basis that all public access and egress (vehicle / cycle / pedestrian) is via the vessel's bow or stern ramps. It is not possible to fully separate different user groups as the vessel ranges along the length of the slipway depending on the tidal conditions. Edge protection is provided along the edges of the slipways, as far as possible, without interfering or creating a potential obstruction for the vessel operations. Where possible, designated pedestrian routes are delineated and provided with sufficient width to maximise the safety of pedestrians as far as reasonably practicable.

Where there is potential for conflict with vulnerable groups, remaining issues will be managed by the staff through their operating procedures. Procedures may include developing specific boarding arrangements for visually impaired, wheelchair users and or elderly / young passengers. In addition, the slipways are subject to regular and thorough cleaning to ensure that slipway surfaces remain free of slippery marine growth as far as practicable.

Whilst every effort has been made to maximise inclusivity, technical and environmental constraints exist and may impose unavoidable limitations on equal access.

2. Standards and Guidance

The following standards and guidance documents have been used throughout the design development to mitigate negative impacts associated with equality.

- Design Manual for Roads and Bridges (DMRB)
- Cycling by Design – Transport Scotland
- The Traffic Signs Regulations and General Directions 2016 (TSRGD)
- Roads and Transport Guidelines for New Developments – The Highland Council
- Building (Scotland) Regulations 2004
- British Standards
- Eurocodes

3. Equality Impact Matrix – Nether Lochaber

At Nether Lochaber the proposed CFIIS primarily involves construction of a new slipway with alignment structure, a new breakwater, a new marshalling area, a new junction to provide access from the A82 to the new marshalling area and slipway and a new accessible shared-use path. The works also include dredging activities within Loch Linnhe. These upgrades are designed to improve the safety, functionality and operational efficiency of the ferry service.

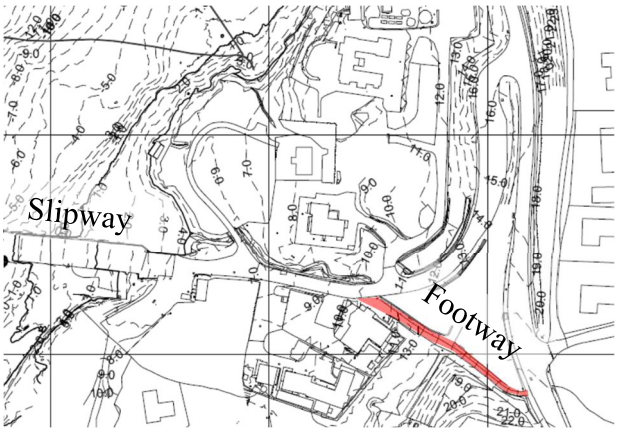

Figure 1 - Existing Footway Location

It is noted that the current slipway can be accessed by pedestrians / wheelchair users via an approximately 85m long shared footway / cycleway between the A82 and A861 or along the road via the A861. Over at least 50m of this path there is a gradient of approximately 1:6 to 1:7. The existing footway is therefore not compliant for pedestrians with mobility issues or wheelchair users.

Photo 1 – View of existing shared footway/cycleway looking down towards A861

Photo 2 – View of existing shared footway/cycleway looking up towards A82

Photo 3 – View of existing shared footway/cycleway looking towards North-Bound bus stop

The existing toilet facility near the slipway includes male, female and a disabled facilities.

Although operations will be relocated to a new Site to the North of the existing facilities, the existing facility provisions are to be retained at the existing Nether Lochaber Slipway. No works are proposed to these facilities as part of the CFIIS.

Slipway Gradients are limited to 1 in 8 to match the requirements of the Ferry Vessels.

Potential negative impacts to access associated with the CFIIS at Nether Lochaber are outlined below, with proposed mitigations measures:

Protected Characteristic Group	Potential negative impact	Mitigating actions to address negative impact
Age	Elderly and young individuals may face challenges with navigating the new infrastructure, boarding the ferry or reaching points for onward travel. Elderly and young are particularly sensitive to weather exposure. Gradient of the Slipway is 1 in 8, dictated by the requirements for the Ferry Vessel Ramp.	The ferry terminal will include clear signage and well-lit areas to enhance safety and accessibility. A covered seating area is provided at each end of the proposed toilet facilities. Shelter at each side of the building allows for alternative shelter options under adverse weather conditions. A raised bus step will be provided at the bus stop to minimise the height difference between the bus and footway, making it easier for elderly and young to board and disembark. Handrailing and guardrailing provided at steps, along edges with significant height differences, on slipway and between vehicle marshalling and pedestrianised areas. The crossfall and ramp gradient of the shared-use path has considered for accessibility under Building Regulations and Cycling by Design guidance. One of the marshalling area lanes is dedicated as a bus lane and provision has been made to position this as close as

Protected Characteristic Group	Potential negative impact	Mitigating actions to address negative impact
		practicable to the toilet facilities, shelter areas and slipway to minimise travel distance for individuals reaching points for onward travel, as far as practicable. Stepped access from the shared-use footway / cycleway to the marshalling area will be provided to offer individuals as short an alternative route, as practicable. Signage, tonal changes, markings, and/or tactile paving will be utilised at crossings / changes in gradients / steps etc. The bus stop and marshalling layout allows for buses to access the bus stop for onwards travel and also to turn and exit the ferry terminal, if necessary. This provision increases accessibility by facilitating bus service access whether or not the route transits via the ferry route. It is not possible to mitigate slipway gradient as this is dictated by the ferry interface requirements. However, surface is designed with a non-slip surface and regular cleaning regime will be

Protected Characteristic Group	Potential negative impact	Mitigating actions to address negative impact
		implemented to ensure surface is as non-slip as practicable.
Disability	Individuals with physical disabilities may face difficulties if the infrastructure and facilities do not fully support accessibility. Gradient of the Slipway is 1 in 8, dictated by the requirements for the Ferry Vessel Ramp.	Security features such as well-lit footways will be provided to enhance safety. The scheme provides 2Nr. disabled parking bays (8% of total). The bays are located at the closest point to the toilet facilities and bus stop to minimise travel distance. One of the disabled car parking spaces also includes EV Car charging capability (25% of EV car charging capacity). The toilet facilities will provide both an accessible water closet (WC) and a Changing Places Toilet (CPT) in accordance with Building Regulations and Standards, to accommodate those with multiple and complex needs. The crossfall and ramp gradient on the shared-use path has considered for accessibility under Building Regulations and Cycling by Design guidance. Stepped access from the shared-use footway / cycleway to the marshalling area will be

Protected Characteristic Group	Potential negative impact	Mitigating actions to address negative impact
		provided to offer individuals as short an alternative route, as practicable. Signage, tonal changes and/or tactile paving will be utilised. at crossings / changes in gradients / steps. A raised bus step will be provided at the bus stop to minimise the height difference between the bus and footway, making it easier for individuals with disabilities to board and disembark. Handrailing and guardrailing is provided at steps, along edges with significant height differences, on Slipway and between vehicle marshalling and pedestrianised areas, where practicable. It is not possible to mitigate slipway gradient as this is dictated by the ferry interface requirements. However, surface is designed with a non-slip surface and regular cleaning regime will be implemented to ensure surface is as non-slip as practicable.
Gender reassignment	Potential for discriminatory treatment with lack of appropriate facilities	The toilet facility contains an accessible disabled and changing places toilet which

Protected Characteristic Group	Potential negative impact	Mitigating actions to address negative impact
	discouraging transgender individuals.	can be used by anyone regardless of gender. The inclusion of a gender-neutral toilet was considered. However, as the toilet facility is not large due to relative infrequent usage, resulting from rapid turn-around of the service, it is considered that the proposed facilities offer sufficient inclusivity without the need to introduce an additional gender-neutral space.
Marriage or civil partnership	No adverse impact identified related to marriage and civil partnership.	N/A
Pregnancy and maternity	Pregnant women or parents/guardians or carers with young children will require suitable facilities.	All footways will be fully accessible, with drop kerbs, tactile paving and shallow gradients provided at crossings. Security features such as well-lit footways will be provided to enhance safety. Baby changing facilities will be provided in both the male and female toilets. Covered seating area(s) are provided adjacent to the toilet facilities.

Protected Characteristic Group	Potential negative impact	Mitigating actions to address negative impact
		The crossfall and ramp gradients on the shared-use path has considered accessibility under Building Regulations and Cycling by Design guidance. Stepped access from the shared-use footway / cycleway to the marshalling area will be provided to offer individuals as short an alternative route, as practicable. Handrailing and guardrailing provided at steps, along edges with significant height differences, on Slipway and between vehicle marshalling and pedestrianised areas.
Race	Non-English speakers may find it difficult to navigate the terminal and access ferry services.	Signage to include English and Gaelic translations as appropriate. Other non-English signage also to be included such as reminders to 'Drive on the Left' in several key European languages, similar to existing. Specific ferry service signage to be developed in consultation with Highland Council.
Religion or belief	No adverse impact identified related to religion or belief.	N/A

Protected Characteristic Group	Potential negative impact	Mitigating actions to address negative impact
Sex (gender)	Potential for discriminatory treatment with lack of appropriate facilities discouraging non-binary individuals. Potential for safety concerns for all genders.	Security features such as well-lit footways will be provided to enhance safety. The inclusion of a gender-neutral toilet was considered. However, as the toilet facility is not large due to relative infrequent usage, resulting from rapid turn-around of the service, it is considered that the proposed facilities offer acceptable inclusivity without the need to introduce an additional gender-neutral space. The toilet facility contains an accessible disabled and Changing Places toilet which can be used by anyone regardless of gender.
Sexual orientation	No adverse impact identified related to sexual orientation.	N/A

4. Equality Impact Matrix – Ardgour

On the Ardgour side of the crossing, the planned infrastructure improvements primarily involve large civil works, such as the construction of a slipway and an overnight pier. These upgrades are designed to enhance functionality and operational efficiency of the ferry service. The scale and nature of the proposed works are considered in relation to the protected characteristic groups under the Equality Act 2010.

The CFIIS includes localised road, footway, marshalling, overnight and slipway improvements at Ardgour. At present the section of the A861 which extends through the work site has poor visibility due to vehicles parking along the edge of the carriageway and does not provide dedicated, safe routes for pedestrians. The works will improve traffic flow and safety through the village, by improving road widths, visibility and site lines for road users, as well as improving pedestrian safety by forming separate accessible footways and defined areas for cyclists and foot passengers to marshal at the head of the Slipway.

Photo 4 – View of existing head of Slipway, looking South.

Photo 5 – Existing Toilet Facilities adjacent to Ardgour Inn, including baby changing and disabled access toilet.

Photo 6 – Typical view of A861 through Ardgour, looking South

The existing toilet facility provisions, appended to the Ardgour Inn, are to be retained for passengers and crew. However, it is recognised that the current facilities on the Ardgour side will not meet the same accessibility and equality standards as those proposed for the Nether Lochaber side. There are longer term intentions to consider further development of the marshalling area and onshore facilities at Ardgour, which may also include updated passenger facilities. However, these proposals will be developed by THC as part of a future phase and are therefore not included in the current consenting package.

Potential negative impacts to access associated with the CFIIS at Ardgour are outlined below, with proposed mitigations measures:

Protected Characteristic Group	Potential negative impact	Mitigating actions to address negative impact
Age	Elderly individuals may face challenges with navigating the terminal or boarding the ferry. Elderly and young are particularly sensitive to weather exposure.	The ferry terminal will include clear signage and well-lit areas. A passenger shelter will be provided at the head of the slipway. Formalised separation of pedestrians from vehicles and formalised parking along the shore area, improving access and safety. Handrailing and guardrailing provided along edges with significant height differences, as far as practicable. Existing toilet facilities remain accessible and in close proximity to the proposed slipway head and car marshalling area. It is not possible to mitigate slipway gradient as this is dictated by the ferry interface requirements. However, surface is designed with a non-slip surface and regular cleaning regime will be implemented to ensure surface is as non-slip as practicable.
Disability	Individuals with physical disabilities may face difficulties if the infrastructure and facilities do not fully support accessibility.	All footways will be fully accessible, with drop kerbs, tactile paving and shallow gradients provided at crossings.

Protected Characteristic Group	Potential negative impact	Mitigating actions to address negative impact
		Formalised separation of pedestrians from vehicles and formalised parking along the shore area, improving access and safety. Handrailing and guardrailing provided along edges with significant height differences, as far as practicable. Existing toilet facilities include a disabled access toilet and remain in close proximity to the proposed slipway head and car marshalling area. A Changing Places toilet is proposed within the nearby Nether Lochaber Toilet Facility. It is not possible to mitigate slipway gradient as this is dictated by the ferry interface requirements. However, surface is designed with a non-slip surface and regular cleaning regime will be implemented to ensure surface is as non-slip as practicable.
Gender reassignment	Potential for discriminatory treatment with lack of appropriate facilities discouraging transgender individuals.	The toilet facility contains an accessible disabled and changing places toilet which can be used by anyone regardless of gender.

Protected Characteristic Group	Potential negative impact	Mitigating actions to address negative impact
Marriage or civil partnership	No adverse impact identified related to marriage and civil partnership.	N/A
Pregnancy and maternity	Pregnant women or parents/guardians or carers with young children will require suitable facilities and safety features.	All footways will be fully accessible, with drop kerbs, tactile paving and shallow gradients provided at crossings. Formalised separation of pedestrians from vehicles and formalised parking along the shore area, improving access and safety. Handrailing and guardrailing provided along edges with significant height differences, as far as practicable. It is not possible to mitigate slipway gradient as this is dictated by the ferry interface requirements. However, the surface is designed with a non-slip surface and regular cleaning regime implemented to ensure surface is as non-slip as practicable. Existing toilet facilities include baby changing facilities and remain accessible and in close proximity to the proposed slipway head and car marshalling area.

Protected Characteristic Group	Potential negative impact	Mitigating actions to address negative impact
Race	Non-English speakers may find it difficult to navigate the terminal and access ferry services.	Signage to include English and Gaelic translations as appropriate. Specific ferry service signage to be developed in consultation with Highland Council.
Religion or belief	No adverse impact identified related to religion or belief.	N/A
Sex (gender)	Potential for discriminatory treatment with lack of appropriate facilities discouraging non-binary individuals. Potential for safety concerns from all genders.	Security features such as suitable lighting will be provided to enhance safety. Existing separate toilet facilities adjacent to the Ardgour Inn are retained. The toilet facility at Ardgour includes an accessible disabled toilet which can be used by anyone regardless of gender.
Sexual orientation	No adverse impact identified related to sexual orientation.	N/A

5. Summary

The CFIIS is essential to improve the long-term viability and efficiency of this critical transport link.

This EQIA identifies the potential impacts on individuals with protected characteristics, and highlights the mitigation measures incorporated into the scheme design to demonstrate compliance with the Equality Act 2010.

Key features such as accessible cycleways / footways, sufficient lighting, enhanced toilet facilities and dedicated disabled parking provisions are among the key actions proposed to support equal access and opportunity for all, so far as reasonably practicable.

Best practice, relevant relevant standards and guidance has been reviewed and considered in design throughout.

Corran Ferry Infrastructure Improvement Scheme

Appendix B.2: Indicative Construction Programme

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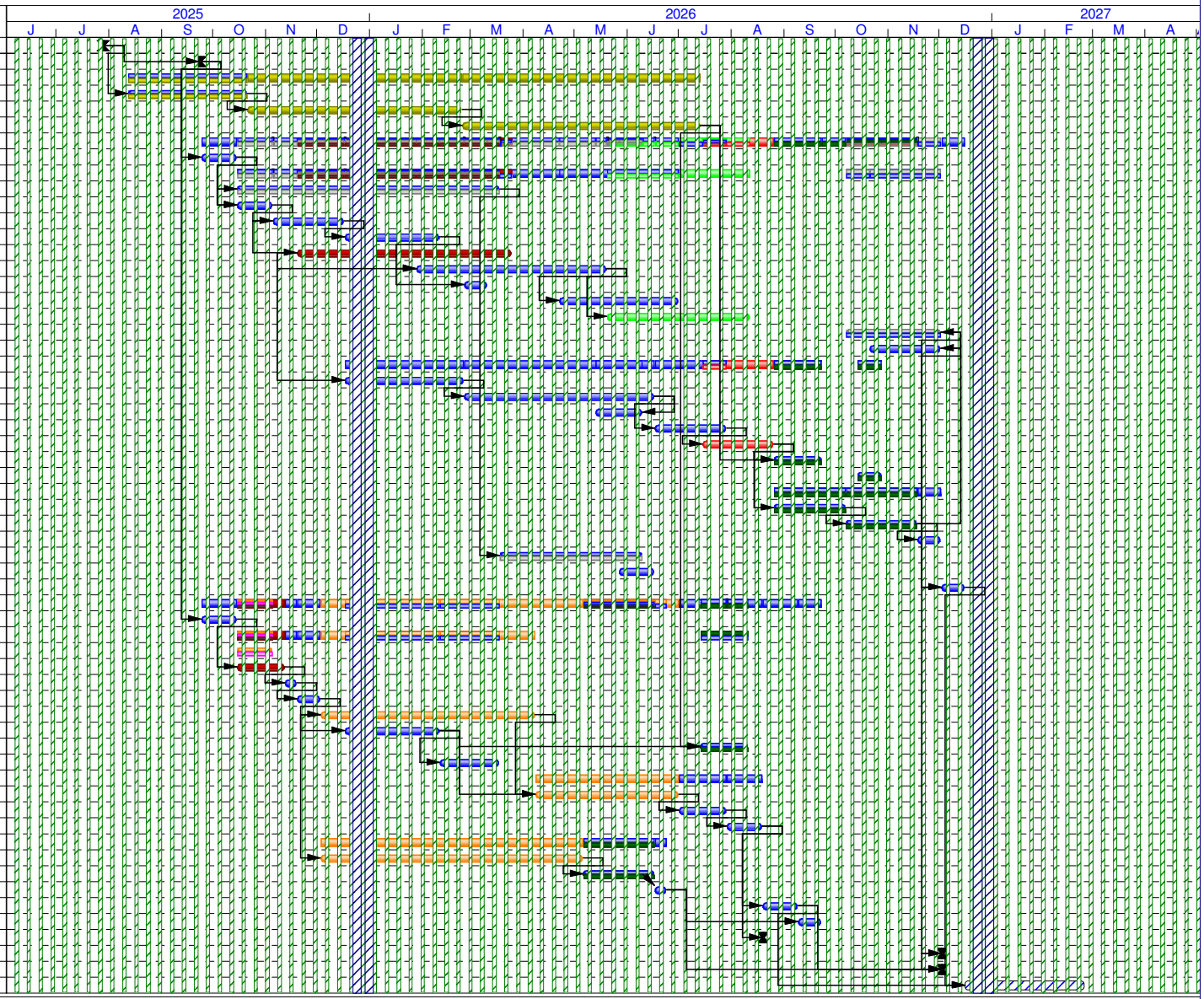
Corran Ferry Terminal Improvements

Indicative Construction Programme - Phase 1
Version: V01

ID	Name	Start	Duration	Finish
1	Contract Award	28/07/25	0.2w	28/07/25
2	Access Date	23/09/25	0.2w	23/09/25
3	Fendering - Procurement	12/08/25	46w	13/07/26
4	Procurement and Detailed Design	12/08/25	10w	20/10/25
5	Fabrication	21/10/25	16w	23/02/26
6	Shipment Period	24/02/26	20w	13/07/26
7	**NETHER LOCHABER WORKS**	24/09/25	62w	15/12/26
8	NL - Mobilisation and Site Establishment	24/09/25	3w	14/10/25
9	NL - Marshalling Area	15/10/25	57w	01/12/26
10	A82 - Road Junction	15/10/25	20w	17/03/26
11	NL - Vegetation Clearance - Junction	15/10/25	3w	04/11/25
12	NL - Vegetation Clearance - Marshalling Area	05/11/25	6w	16/12/25
13	NL - Excavation	17/12/25	6w	10/02/26
14	NL - Rock Dredge	19/11/25	16w	24/03/26
15	NL - Reclamation / Earthworks	28/01/26	16w	19/05/26
16	NL - Relocate Site Offices to Marshalling Area	25/02/26	2w	10/03/26
17	NL - Rock Armouring	22/04/26	10w	30/06/26
18	NL - Building - Toilet Facility	20/05/26	12w	11/08/26
19	NL - Surfacing	07/10/26	8w	01/12/26
20	NL - Furniture, Signage etc.	21/10/26	6w	01/12/26
21	NL - Alignment Structure	17/12/25	43w	27/10/26
22	NL - Breakwater - Core	17/12/25	8w	24/02/26
23	NL - Breakwater - Rock Armour	25/02/26	16w	16/06/26
24	NL - Fendering Thrust Block	13/05/26	4w	09/06/26
25	NL - Alignment Steelwork	17/06/26	6w	28/07/26
26	NL - Toe Pins	15/07/26	6w	25/08/26
27	NL - Fendering Installation	26/08/26	4w	22/09/26
28	NL - Fixtures and Fittings	14/10/26	2w	27/10/26
29	NL - Slipway	26/08/26	14w	01/12/26
30	NL - Walls	26/08/26	6w	06/10/26
31	NL - Slab	07/10/26	6w	17/11/26
32	NL - Fixtures, Scour Protection etc.	18/11/26	2w	01/12/26
33	NL - Footway / Cycleway Extension	18/03/26	12w	09/06/26
34	NL - Steps	27/05/26	3w	16/06/26
35	NL - Demobilisation	02/12/26	2w	15/12/26
36	**ARDGOUR WORKS**	24/09/25	50w	22/09/26
37	ARD - Mobilisation	24/09/25	3w	14/10/25
38	ARD - Overnight Approach Structure	15/10/25	40.8w	10/08/26
39	ARD - Cable Restraint and Removal Works	15/10/25	3w	04/11/25
40	ARD - Dredge	15/10/25	4w	11/11/25
41	ARD - Reclamation	12/11/25	1w	18/11/25
42	ARD - Rock Armouring	19/11/25	2w	02/12/25
43	ARD - Sheet Piling Approach	03/12/25	16w	07/04/26
44	ARD - Decking	17/12/25	6w	10/02/26
45	ARD - Fendering Installation	14/07/26	4w	10/08/26
46	ARD - Fixtures and Fittings	11/02/26	5w	17/03/26
47	ARD - Overnight Head Structure	08/04/26	19w	18/08/26
48	ARD - Sheet Piling and Infill	08/04/26	12w	30/06/26
49	ARD - Decking	01/07/26	4w	28/07/26
50	ARD - Fixtures and Fittings	29/07/26	3w	18/08/26
51	ARD - Slipway	03/12/25	27w	23/06/26
52	ARD - Sheet Piling	03/12/25	20w	05/05/26
53	ARD - Slab	06/05/26	6w	16/06/26
54	ARD - Fixtures and Fittings	17/06/26	1w	23/06/26
55	ARD - Existing Pier Demolition	19/08/26	3w	08/09/26
56	ARD - Demobilisation	09/09/26	2w	22/09/26
57	Relocate Vessels to ARD - Overnight Berth	19/08/26	0.2w	19/08/26
58	Relocate to New NL Ferry Terminal	02/12/26	0.2w	02/12/26
59	Relocate to New ARD Slipway	02/12/26	0.2w	02/12/26
60	Contractor's Float	16/12/26	8w	23/02/27



Fendering Fabricator
Diving Contractor
Drilling Contractor
Building Contractor
Dredge Contractor
Surfacing Contractor
Piling Contractor
Milestone
Maritime Civil Contractor
Specialist Contractor
Contractor's Float

Corran Ferry Infrastructure Improvement Scheme

Appendix C.1: Scoping Report

Wallace Stone
Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

Corran Ferry Infrastructure Improvement Scheme Scoping Report

Date: 14/05/2024

Document Number: 99_REP_03_1

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Appendix 6. Transport Assessment Scoping Report .....

1 Introduction

The Highland Council (THC) are proposing to construct new ferry service infrastructure at the Corran Narrows under the Corran Ferry Infrastructure Improvement Scheme (hereafter referred to as 'CFIIS' or 'the scheme'). The scheme will involve the construction of new infrastructure in the village of Ardgour, and just north of the 'Corran' settlement in the region of Nether Lochaber, to facilitate the introduction of a new electric vessel (NEV) for the ferry service and improve facilities for users and operators of the Corran Ferry. The NEV, commissioned specifically for this crossing, will improve the resilience of the service and reduce long-term carbon emissions (refer Section 2.3: Project Need and Section 3: Development Description for details).

The development will involve both marine construction and dredging works below Mean High Water Springs (MHWS), as well as construction works above Mean Low Water Springs (MLWS). Subsequently, the works will be subject to licensing under the Marine (Scotland) Act 2010 and planning permission under the Town and Country Planning (Scotland) Act 1997 (as amended).

An Environmental Impact Assessment (EIA) Screening Opinion was requested from THC Planning on 25th July 2023, for which a positive Screening Opinion was received on 16th August 2023 that an EIA would be required to support the planning application. In consideration of THC's Screening Opinion and managing the risks of the project, the CFIIS project team have elected to undertake and submit a single EIA that addresses both terrestrial and marine elements of the scheme. Refer Section 4.1.3: Environmental Impact Assessment for more information.

Formal Scoping Opinions are therefore sought from THC and the Scottish Marine Directorate-Licensing and Operations Team (MD-LOT) under Regulations 17 and 14 respectively of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017, as amended, and the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017, as amended. The opinions will be used to inform the scope of the EIA that is required in support of the Planning Permission and Marine Licence applications.

1.1 Report Purpose

The purpose of this Scoping Report is to ensure that the relevant potentially significant environmental impacts of the proposed development are taken forward for assessment and inclusion within the Environmental Impact Assessment Report (EIAR). The aim of this Scoping Report is therefore to provide sufficient information to allow THC's Planning Department and the MD-LOT, including their respective consultees, to confirm the potential environmental impacts of the proposed development that are to be considered within the EIAR. This approach has been designed to result in a proportionate and efficient EIA, with effort focussed onto topics which could be significant and require further consideration to understand their effects. This approach will facilitate the minimisation of any negative effects, as far as practicable, and the maximisation of beneficial effects.

1.2 Scoping Methodology

The scope of the CFIIS consent applications will include the construction and operations of the new ferry service infrastructure over its lifetime. The vessels (i.e., NEV and existing ferries) and

their operation do not require planning or marine licence consent, however, where aspects of vessel operation may cause impacts, these will be considered as part of this Scoping Report (and the subsequent EIA) to provide a holistic assessment of the proposed future state.

As the detailed design is not yet complete at the time of producing this Scoping Report, the 'Rochdale Envelope' approach will be utilised. Rochdale Envelope is a term derived from EIA case law which seeks to balance the need for flexibility for a development that is not yet fully defined, with the ability to assess significant effects of the development upon the environment, and any necessary mitigation (R. v Rochdale MBC ex parte Milne (No. 1) and R. v Rochdale MBC ex parte Tew (1999) and R. v Rochdale MBC ex parte Milne (No. 2) (2000)). It is described by a series of maximum extents known as the 'worst case' scenario. The detailed design of the scheme can then vary within this 'envelope' of design without invalidating the corresponding EIA and consent. Hence, the actual footprint of the main scheme development will be smaller than the boundary utilised for scoping.

The scoping boundary for the CFIIS is depicted in Drawing 99_DRG_15_1. This scoping boundary will be refined into a redline boundary (RLB) for subsequent planning and marine licence applications. Additional minor works out with the scoping boundary (e.g. signage installation along roads) may be determined during the detailed design process and will then be incorporated as part of the RLB.

The methodology proposed to inform this scoping exercise is based on the Source-Pathway-Receptor model (refer Figure 1.2.1).

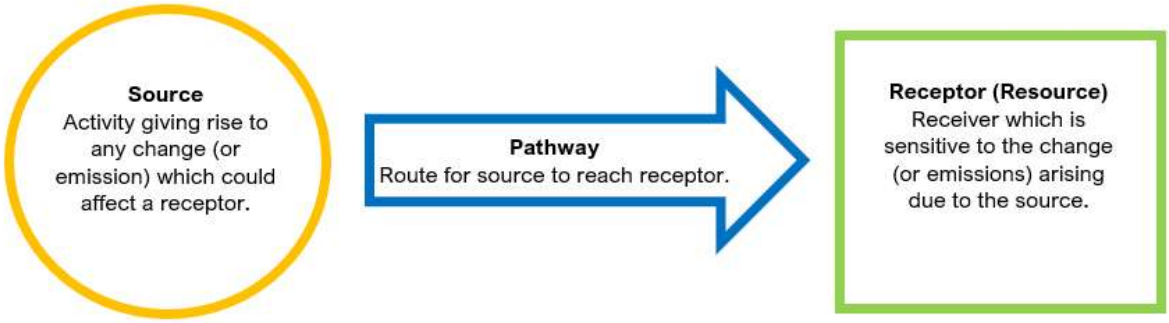

Figure 1.2.1: Source → Pathway → Receptor Model

The construction and operational activities for the project, i.e., the 'sources' of impacts are described upfront in Sections 3.2: Development Description and 3.4: Project Phases. Environmental aspects are then discussed on a topic basis in Sections 6 to 23. Each environmental topic discusses the baseline condition (to give an initial understanding of the receptors), identifies potential construction and operational impacts or effects and, where necessary, proposes mitigation measures to be implemented as part of the project. For the purpose of this Scoping Report, the term 'impact' has been used to refer to the way in which an environmental resource/receptor is changed by the project proposal. 'Effect' is used to describe the consequence of the change to (or impact upon) an environmental resource/receptor.

Topic sections conclude by outlining proposed inclusions and exclusions for the EIA. In line with IEMA guidance, topics will be proposed to be **scoped in** or **scoped out** of the EIA based

on the credible potential for significant residual effects occurring after the implementation of mitigation (IEMA, 2017).

Where an environmental topic is proposed to be **scoped out** of the EIA on the basis of mitigation, that mitigation is included in the Initial Schedule of Mitigation (ISoM) (Section 24). The mitigation outlined in the ISoM shall be transcribed into a Construction Environmental Management Document (CEMD) developed for the CFIIS. The CEMD will also include mitigation identified by the EIA process. Where a topic is proposed to be **scoped in** to the EIA, consideration is also given to the proposed EIA methodology for each topic.

1.3 Consultation

In the lead up to the Scoping Report and throughout the development design, a programme of consultation has and will continue to be undertaken with statutory and non-statutory consultees, including members of the public.

The CFIIS project team sought advice from THC's Pre-Application Advice Service for Major Developments by attending a pre-application meeting on 18th January 2023. The Service is made up of relevant officials across THC and other key agencies. The output of this consultation was the receipt of a Pre-application Advice for Major Developments pack (Reference number: 22/04570/PREMAJ) (THC, 2023a) with inputs from:

- THC Planning and other departments/roles (i.e., transport planners, access officer, ecologist, forestry officer, landscape office, Flood Risk Management team, contaminated land officer and environmental health officer;
- The Marine Directorate Licensing Operations Team (MD-LOT);
- NatureScot;
- Transport Scotland (TS);
- Scottish Environment Protection Agency (SEPA);
- The Northern Lighthouse Board (NLB); and
- Historic Environment Scotland (HES).

Consultation has also been underway with:

- Crown Estate Scotland (CES) - with regard to proposed seabed/foreshore development and marine works licences for marine surveys and ground investigations;
- The Maritime & Coastguard Agency (MCA) – for confirmation marine surveys and ground investigations would not cause a danger or obstruction to navigation;
- Utility providers – with regard to existing and proposed power and water assets; and
- Landowners – with regard to land leasing and acquisition.

Note that the consultation engagements described above are not exhaustive, and stakeholder discussions have also been held with various businesses and individuals. As the EIA progresses, additional organisations will be identified and consulted as part of the Pre-application Consultation (PAC) process (refer to Section 4.1.3: Pre-application Consultation). A summary of relevant consultation will be presented in a PAC Report for submission as part of consent applications. The PAC Report will provide an audit trail of how the project has responded to stakeholder comments. Consultation that is specific to a particular EIA discipline will be reported in detail where relevant within the technical chapters of the EIAR.

2 Background

2.1 Location

Located in the west of Scotland, approximately seven miles south-west of Fort William, the Corran Narrows is the narrowest section of Loch Linnhe and has a grid reference centre point of NN 01826 63387 (see Figure 2.1.1). Loch Linnhe is located along the Great Glen fault line and framed by the hills running south-west to north-east. The loch effectively acts as a dividing landform, separating the western peninsula landmass (including the communities of Ardgour, Sunart, Ardnamurchan, Moidart, and Morvern) from the region of Lochaber in the east (see Figure 2.1.1).

Figure 2.1.1: Location of the Corran Narrows (Google Maps, 2024)

On the west side of the Corran Narrows is the village and community of Ardgour. On the eastern side, is a small settlement within the community catchment of Nether Lochaber. Whilst this settlement is understood to be associated with the nearby settlement of Onich to the south, for the purpose of this report, this settlement will be hereafter referred to as 'Corran' in order to distinguish this area specifically (see Figure 2.1.2). The Corran Narrows and adjacent settlements fall within the administrative area of THC. The residents and businesses of Ardgour and Corran are also served by the respective Ardgour and Nether Lochaber Community Councils.

The Corran Ferry service transits across the Corran Narrows, between the villages of Ardgour (on the west shore) and Corran (on the east shore) on the route depicted in Figure 2.1.2.

Figure 2.1.2: Current Ferry Crossing Route between Ardgour and Corran

Ardgour is a small, coastal village consisting of approximately 30 houses, the Inn at Ardgour and a historic lighthouse. Ardgour is encompassed by the Ardgour Special Landscape Area and includes a long foreshore of sandy, gravelly beach. A small, steel-frame is located at the foreshore. Three miles west of Ardgour is the village and crofting properties of Clovullin.

The settlement of Corran consists primarily of approximately 7 'shorefront' houses, the Corran Bunkhouse and The Corran (serviced accommodation). A private road on the east side of the A82 leads to another 7 or so houses. The area north and east of Corran is characterised by natural broad-leaf or plantation woodland. Villages south along the A82 include Bunree and Inchree, which offer various places for short-stay accommodation. A small unnamed watercourse runs from the east, under the A82 and alongside the A861 through the village to the loch.

Three power transmission cables owned by Scottish and Southern Electricity Networks (SSEN) are situated on or above the seabed of the Narrows, making landfall at various locations within or adjacent to both Ardgour and Corran settlements (see Drawing 99_DRG_15_1). Two 33kV cables are currently de-energised. The third cable, an 11kV cable, is scheduled for de-energisation by SSEN prior to the commencement of the CFIIS construction. These sub-sea cables have been/will be superseded by directionally drilled ducted power cables installed across the Corran Narrows to the south of Corran Point.

As discussed in Section 1.2: Scoping Methodology, the proposed area of development utilised for scoping is delineated by the scoping boundary as shown in Drawing 99_DRG_15_1.

2.2 The Corran Ferry

The Corran Ferry service carries passengers and vehicles across the Corran Narrows between the settlements at Corran and Ardgour. Although a short crossing of approximately 420m between slipways, the service provides an essential connection for the western peninsular communities to and from Lochaber, as well as for those on the Isle of Mull via the Fishnish – Lochaline route. There has been a ferry crossing on Loch Linnhe at the Corran Narrows for centuries. The first turntable ferry was introduced in the 1930s, which could accommodate a single car at a time.

The ferry service provides these communities with access to hospitals, further education, larger retail outlets and, in some instances, their place of work and/or supply chain needs. In addition, it also acts as a gateway for tourists visiting the peninsula and onwards to destinations such as Mull, Iona and Mallaig.

THC owns, funds and operates the Corran Ferry service, which is the busiest single vessel operated route in Scotland. The ferry operates a frequent transit operating 361 days of the year, carrying over 270,000 cars each year. The alternative route is a 40-mile road journey between Ardgour and Corran via Fort William.

The Corran service currently operates with one of two compatible, though ageing, vessels; the MV Maid of Glencoul (in service since 1976) and the MV Corran (in service since 2001). The two vessels are unique in that they support quarter-point vehicle ramps, meaning that they berth alongside the slipway, with their ramps positioned at an angle for loading/unloading vehicles from the slipway (see Figure 2.2.1). The vessels are designed to hold station alongside the slipways despite the fast flowing currents in the Narrows.

Figure 2.2.1: The MV Corran Quarter-point Vessel on the Ardgour Slipway

2.3 Project Need

As mentioned previously, the purpose of the CFIIS is to provide new infrastructure to support the introduction of a larger NEV to increase the resilience of the Corran Ferry service and reduce long-term carbon emissions. Challenges to the current service, imposed by the existing vessels and infrastructure are described in this section.

The current ferries are ageing. The main ferry utilised on the route is the MV Corran, she is 23-years old with a further life expectancy of approximately 10 years. The MV Maid of Glencoul, utilised during periods to meet demand and when the MV Corran is out of service, is 49 years old. The MV Maid of Glencoul is operating well beyond her original design life and in urgent need of replacement, with the sourcing of spare parts becoming both difficult and expensive. In situations where the service is suspended or not operating (e.g. after hours, or when vessels are out of service for breakdown repairs, maintenance or during periods of extreme weather), the road-based diversion time can be up to two hours, and includes a height restriction for some tall vehicles, due to a restricted height rail bridge. Hence, a new vessel is required in the immediate-term.

The current vehicle-deck capacity is insufficient to cope with peak demand periods. When there is short-shipped traffic (i.e., vehicles left behind), the ferry service will routinely depart from timetable and begin to 'shuttle' between slipways to minimise and clear any backlog of queuing traffic. Whilst this is effective, it cannot always keep pace with demand, especially during peak tourism season (Summer).

Marshalling areas on both sides of the crossing are too small to accommodate peak demand queueing, partly due to short-shipped traffic. This increases road safety and network performance risks. This risk is greater on the Nether Lochaber side of the Narrows, where peak traffic may ultimately back up out onto the A82 trunk road.

The junction with the A82 is sub-optimal in that it is located close to a bend with restricted sight lines, includes very tight entry and exit corners, includes no stacking capacity for turning vehicles from Fort William and lacks suitable deceleration or acceleration lanes.

The two ferry vessels overnight on 'swing' moorings located on the seabed near Ardgour, which requires a vessel-to-vessel transfer of crew at the start and end of the operating day via a small crew transfer boat. This practice is a comparatively high-risk arrangement and consequently has been gradually phased out elsewhere in Scotland in recent decades.

When the MV Corran is away for maintenance or repairs, the standby vessel, MV Maid of Glencoul, is in operation alone. She has a significantly smaller vehicle capacity and includes more onerous height and weight restrictions, limiting ferry access to the peninsula for some larger vehicles. These restrictions on the MV Maid of Glencoul mean that the largest commercial vehicles cannot access the peninsula at all, due to the aforementioned bridge height restrictions on the alternative road route.

The current 1:10 gradient slipways are not fitted with any berthing/alignment structures and hence the service more susceptible to the impact of extreme environmental conditions. There are no other quarter-point vessels operating in Scotland which could replace the MV Corran and MV Maid of Glencoul.

The more common, similarly sized, ferry vessels found within Scotland are the 'straight through' roll-on roll-off vessels such as Caledonian Maritime Assets Limited's (CMAL's) 'Loch Class' vessels. However, the 'Loch Class' vessels are designed to operate on steeper 1:8 slipways and, particularly at the Corran slipway, would probably require an alignment structure to allow them to maintain positioning on the slipway due to the wave, wind and strong tidal currents routinely experienced in the Narrows.

The Corran Ferry service is the only major vehicle ferry service operated by THC. The Corran Ferry therefore must function as a standalone service with intrinsic built-in resilience.

In summary, there is a need to ensure and maintain an appropriate, resilient connection between communities either side of the Corran Narrows; various options for which have been considered by THC over the years. The proposed CFIIS specifically addresses the infrastructure requirements to facilitate an NEV and standby vessel; the design requirements for which are discussed in Section 2.4. However, the prospect of an alternative crossing method for the Corran Narrows have been considered, and for completeness, this is discussed in Section 2.5: Alternative Crossing Options.

2.4 Design Requirements

In order to improve the service and increase resilience, up to two NEVs, with an increased vehicle transport capacity, were proposed to replace the existing quarter-point vessels in the Corran Ferry service. Electric vessels were proposed over diesel-powered vessels as a means of reducing greenhouse gas (GHG) emissions in line with Scotland's commitment to achieving net-zero GHG emissions (see Section 4.2.1 for further details). The 'straight-through' NEVs would require new infrastructure to support their operation. Infrastructure suitable for the NEV(s) will also be able to support other vessels with this more conventional 'straight-through' arrangement, providing additional operational resilience by allowing the opportunity to collaborate with other Scottish ferry operators for potential vessel substitution arrangements. This infrastructure and it's required functions formed the scope of the initial CFIIS design brief.

Slipways at a 1:8 gradient will be required to support the 'straight-through' boarding and offloading arrangement for the NEV(s). The currents of the Corran Narrows at approximately mid-tide are onerous and run largely parallel to the shoreline during ebb and flow tides. The Corran shoreline, specifically, runs immediately adjacent to the deeper channel through the Narrows. In addition, the predominant south-westerly winds generate wave and wind conditions that penetrate through the Narrows and create the most onerous conditions on the Corran side. The Ardgour slipway experiences considerably lower tidal currents and less severe environmental conditions, with the worst conditions resulting from less common north-easterlies. It needs to be ensured that the vessels are stable on the slipways, taking account of tidal and weather conditions. This may require engineering stabilisation, protection and support for safe and efficient operations.

An overnight berthing structure will be required for vessel berthing, NEV charging, water bunkering and safe crew access on and off the vessels. Berthing on the overnight berthing structure will eliminate the need for crew to undertake vessel-to-vessel transfer to vessels on swing moorings. Berthing and operation of the vessels will require sufficient water depths to ensure safe under-keel clearance to the seabed throughout the tidal range. It was also recognised power requirements for NEV charging may require an upgrade to the electricity grid.

Marshalling areas with sufficient capacity for demand will be required to safely manage the queuing vehicle traffic and minimise the likelihood of traffic backing-up onto busy roads. Safe access for vehicles, cyclists and pedestrians will be required between the slipways, marshalling areas, main roads, public transport (i.e. bus stop(s)) and villages; requiring good junction design and promoting the use of active travel networks.

Shore-based ferry staff collecting fares and managing loading/unloading operations for the ferry service ('pursers') will require limited welfare and shelter facilities. Public access to appropriate facilities including toilets, changing places, electric vehicle (EV) charging, bicycle shelters and parking will also be required, serviced by appropriate utilities including lighting, power and water.

It was proposed two ferries could potentially operate concurrently on a timetable in peak times to minimise backing up of queuing traffic. If this was to go ahead, this would require staffing for two crews (essentially duplicating THC's ferry operations team). Therefore, in addition to the infrastructure outlined above, staff accommodation and additional storage would also be required. The introduction of crew accommodation triggered the desire and subsequent proposal for affordable accommodation in line with THC policy. Note, this requirement was later removed from the CFIIS design scope, refer Section 2.6: Design Development for details.

2.5 Alternative Crossing Options

Prior to the initiation of the CFIIS, various options were considered for improving the transport connection across the Corran Narrows. THC commissioned a high-level feasibility study for a fixed link (bridge or tunnel) option, the report of which was issued in March 2020 (Stantec, 2020). This report concluded a fixed link was potentially feasible, and was subsequently used to support the nomination of a fixed link at Corran to be carried forward into the Scottish Government's Strategic Transport Project's Review 2 (STPR2). The outcomes of STPR2 inform the national transport investment in Scotland over the following 20 years.

Unfortunately, a fixed link across the Corran Narrows was not adopted into the priorities of STPR2. Without a credible funding option or timescale for a fixed link, focus was directed into upgrading the ferry service as the most feasible and deliverable option for improving the transport link in the short to medium term. There remains an aspiration from THC for a fixed link across the Corran Narrows in the future.

An outline business case for commissioning replacement vessels (and associated upgrade to the ferry infrastructure) was produced in 2022 (Stantec, 2022). The business case as presented in the Stantec report is summarised in Section 2.2: Project Need. The report sought to answer the question of whether both vessels in service at the time (MV Corran and MV Maid of Glencoul) should be replaced, or whether there was case for retaining the MV Corran as a secondary vessel. The report concluded there was a valuable case for replacing both ageing vessels with two NEVs, and hence, this was carried forward as the operational scenario for which the infrastructure of the CFIIS needed to support. (Note, however, the intention for two NEVs was later scaled back to one as described in Section 2.6: Design Development). It was essential, that no part of the CFIIS was to preclude the option of a fixed link across the Corran Narrows in future.

The Stantec (2020) study concluded that the potential feasibility of a fixed link at Corran Narrows based on indicative routes as shown in Figure 2.3.1. The northern crossing (RC2) was

found to have more disbenefits than other routes. Therefore, it is THC's understanding that any future fixed link will utilise land south of the narrows (similar to indicative routes RC3 RC4 or RC5). This has been taken into account during development of the preferred option for the CFIIS, hence the proposed CFIIS will not conflict with any land that may be required in future for a fixed link.

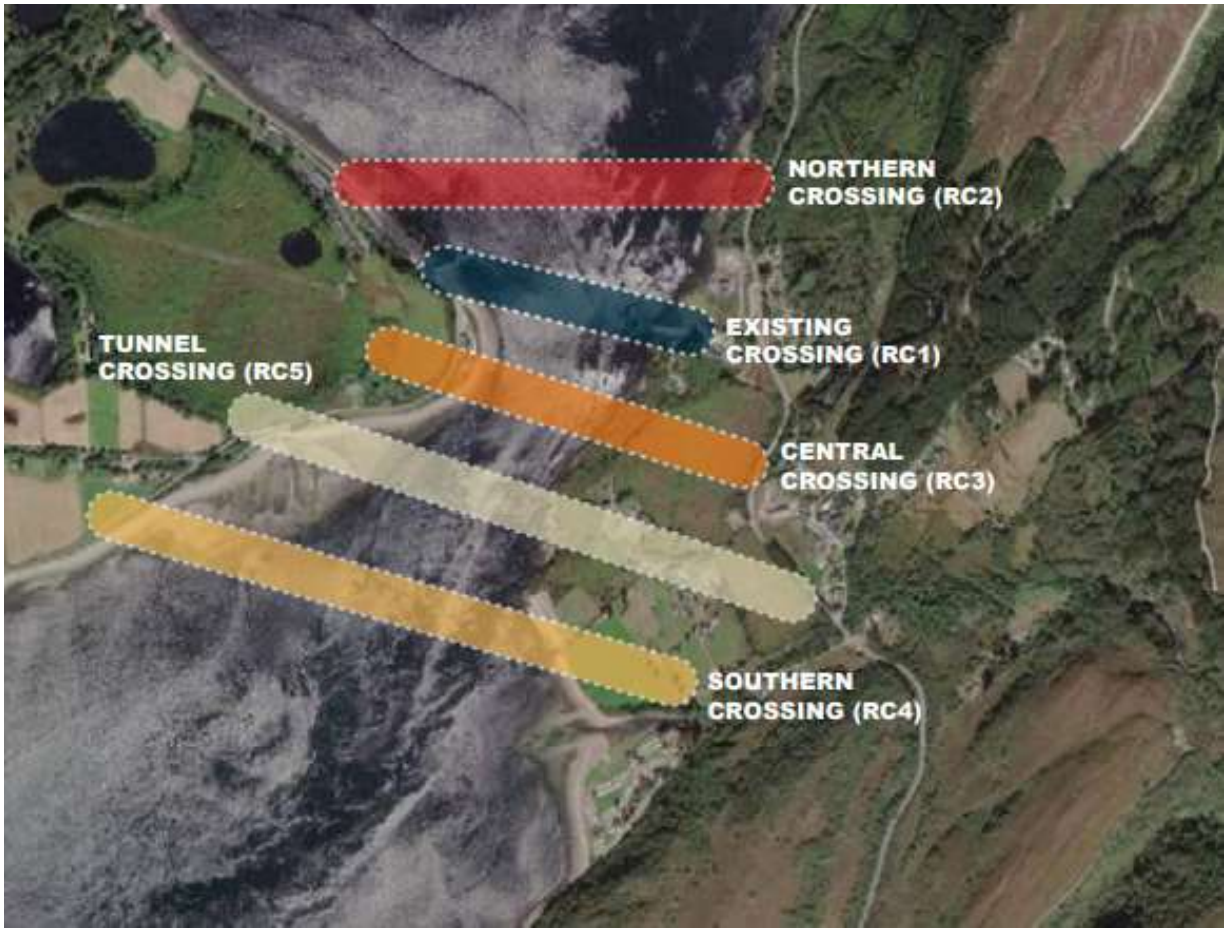

Figure 2.3.1: Conceptual Routes of a Fixed Link at Corran Narrows (Stantec, 2020)

2.6 Design Development

The design scope of the CFIIS has evolved over a two-year period in response to stakeholder feedback, design constraints, funding priorities and wider THC objectives.

Various initial, conceptual designs were developed to position the key infrastructure described in Section 2.4: Design Requirements, within the locality in a way that was potentially feasible and in consideration of constructability and consentability. These designs were then subject to a process of detailed optioneering assessment, which considered stakeholder feedback from the initial PAC events (2022) and pre-application planning responses (refer Sections 4.1.4 and 1.3 respectively) as well as outputs from early geophysical, ecological and wave/current studies.

A preferred layout for each side of the Narrows was carried forward for further refinement and outline design. Wave and current modelling led to the introduction of a breakwater on the southern side of the proposed new slipway north of Corran. The breakwater will provide a degree of shelter from adverse waves and strong tidal currents at the slipway berth, improving

the condition for operations, especially in adverse weather. The breakwater will also be used to secure a fendered framework to support the vessel when on the slipway (i.e., an alignment structure). Conversely, tidal currents and adverse wave conditions at the proposed location for the new slipway on the Ardgour side are less extreme, and hence the requirement for an alignment structure was removed for the Ardgour slipway.

During the design process, it became clear that funding for a second NEV was unlikely to be secured in the short-medium term. Instead, only one NEV would initially be commissioned and the MV Corran would be retained as the back-up vessel. In light of this, and in consideration of community feedback, the decision was made to focus the CFIIS to include only the infrastructure essential to accommodating the introduction of a single NEV and/or improving the resilience of the service, thereby alleviating the challenges described in Section 2.3: Project Need. It is recognised that in peak times, the operational ferry will likely need to depart from timetable and operate a shuttle service, as per current operations.

Other proposals developed for the ferry crossing, including enhancement and extension of the existing marshalling and parking provisions at Ardgour, modernising storage and office facilities and provision of dedicated staff accommodation to assist in staff recruitment and retention remain within THC's medium-long term aspiration but no longer form part of the CFIIS scope.

Through consultation with SSEN, it was that confirmed power requirements for NEV charging during the operational phase will require an upgrade to the electricity grid, to be undertaken by SSEN. During the design process, it was identified that there is a possibility for the NEV and CFIIS infrastructure to be commissioned and ready for operation prior to the availability of sufficient power from the grid. In this case, the NEV will be charged by a temporary diesel generator with supporting fuel storage. The generator may be mobile (e.g., trailer-mounted) or fixed, and will only be utilised until the permanent grid connection is in place. However, as there is a chance the generator could be required for more than a few months, a temporary, fixed option was introduced to the design scope of the CFIIS.

During the outline design phase, it was identified that there is a need to remove existing infrastructure which is in conflict with the proposed development or construction footprint at Ardgour, namely, the western portions of two existing SSEN subsea cables (which will become redundant prior to construction commencing) and the existing small boat pier.

Details of infrastructure carried forward for construction in the CFIIS are outlined in Section 3: Development Description. A discussion of design alternatives, results of the optioneering assessment and justification for the final design will be included in the EIAR.

3 Development Description

Design elements are discussed in Sections 3.1 to 3.3, while the lifecycle phases are discussed in Sections 3.4 to 3.6.

3.1 Scheme Overview

As part of the coastal nature of the scheme, construction will occur in the marine and terrestrial environment including intertidal areas. Infrastructure of the CFIIS will include:

On the Ardgour side:

- Slipway;
- An overnight berthing structure;
- Localised road improvements and formalised residential parking;
- Footpath(s);
- Vessel charging facilities;
- Temporary diesel generator with associated fuel storage in appropriate housing/containment; and
- Associated services (lighting, power, water and drainage).

On the Nether Lochaber side:

- Slipway;
- A breakwater with vessel alignment structure;
- A new marshalling area and access road;
- A new junction with the A82;
- Public car parking;
- A toilet block;
- Shared-use Path(s);
- A bicycle shelter;
- EV car charging units;
- Purser's kiosk; and
- Associated services (lighting, power, water and drainage).

Dredging on both the Ardgour and Nether Lochaber sides will also be required, as will the removal of sections of redundant sub-sea cabling near the Ardgour infrastructure.

Elements of the scheme are described in more detail in Sections 3.2 and 3.3. An overview of the conceptual design is outlined in Drawing 2387-WS-ZZ-ZZ-DR-C-0101 P02.

The new infrastructure and NEV will work in combination to increase service capacity and resilience, having both been designed in consideration of the specific engineering and environmental challenges of the Narrows. The overnight berthing structure at Ardgour will allow for overnight charging and safer crew access to the vessels. The breakwater on the Nether Lochaber side will provide protection from wave, current and wind conditions and the attached alignment structure will provide vessel support, easing vessel access onto the slipway in adverse current and weather conditions. The infrastructure upgrade of the CFIIS is therefore expected to minimise the service disruption risk associated with strong currents and adverse weather, whilst the NEV will result in reduced risk of downtime for breakdowns and maintenance in comparison to the aging vessels currently operating the service. Improvements

to marshalling and access especially on the Nether Lochaber side will improve road safety and service user experience and continue to facilitate active travel links.

Descriptions of the construction techniques for the infrastructure are outlined in Section 3.4.1: Construction Methods.

3.2 Development at Ardgour

Development at Ardgour will take place predominantly seaward of the A861, refer Drawing 2387-WS-ZZ-AG-DR-C-0102 P03.

3.2.1 Slipway and Road Access

A 1:8 gradient concrete slipway, supported on infilled steel sheet piled foundations, will be constructed just north of the existing slipway. The marshalling lane from the front of the existing marshalling area will be extended adjacent to the A861 for vehicle access to the new slipway. Land reclamation will be required to create footings for the root of the slipway and marshalling lane extension.

3.2.2 Overnight Berthing Structure

The overnight berthing structure is designed as a T-head pier to offer shelter for the operational and standby ferry vessels from the most challenging environmental conditions at Ardgour which prevail from the north-east. The pier approach element and pier head elements which make up the T-shaped overnight structure are proposed to be infilled steel sheet piled structures supporting a concrete deck. The pier approach is approximately 100m with berths on either side. The pier head is approximately 50m long.

The overnight berthing structure will be fitted with a gantry and/or feeder pillar for overnight NEV charging. The overnight berthing faces will be fitted with a timber and/or rubber fendering system. Other faces, including a potential fair-weather berth and small boat berth will be fitted with vertical timber and/or rubber linear fendering. The overnight berthing structure will also be fitted with bollards, ladders, grab rails, copes, handrailing, washdown/bunkering points and lighting columns.

In addition, each overnight berth on the pier approach will be fitted with a pontoon and associated access walkway(s) to facilitate safe crew transfer between the shore and the berthed vessel.

The structure also includes the potential for use of the north of the pier head as a 'fair-weather' berth.

A small boat berth, with ladder access and mooring travellers is proposed to the sheltered south face of the pier head.

To provide access to the overnight berthing structure, a small area of land reclamation will be constructed at the landward end. Rock armoured protection will be installed on the sloping seaward faces of this land reclamation area. Pedestrian access to the beach on either side of the root of overnight berthing structure will be provided.

To ensure there is sufficient water depth for unrestricted access in all tidal conditions, the works require dredging of the seabed each side of the overnight berthing structure. Where suitable, dredge arisings shall be retained and reused on site as fill for structures and/or

reclamation. Unsuitable arisings may need to be disposed of at a suitable licenced dredge disposal site.

3.2.3 Parking Area

Formalised parking spaces will be constructed on the seaward side of the A861 between the new slipway and the overnight berthing structure. This will also require a small element of land reclamation from the intertidal area. Rock armoured protection will be installed along the length of the seaward face.

3.2.4 Purser's Kiosk

A small welfare cabin, termed the 'purser's kiosk' will provide shelter, storage for essential items (including first aid equipment) and simple welfare amenities for the marshalling staff (e.g., kettle). This is proposed to be constructed in the existing marshalling area. The purser's kiosk is most likely to be in the form of a prefabricated cabin on a concrete base.

3.2.5 Pier Demolition

Between the proposed new slipway and overnight berthing structure is the existing small pier, extending approximately 40m seawards and made from a steelwork approach with a 15m wide steel sheet piled head. Demolition of this existing pier is required to make space for vessel movements when using the new infrastructure.

3.2.6 Diesel Infrastructure

Although it is hoped that the SSEN grid will be able to provide a suitable power supply for vessel charging in time for the NEV commencing operations at Corran Narrows, this cannot be guaranteed at this point. Hence provision is currently included for a temporary diesel generator in appropriate sound insulation housing which would only be utilised until the required electricity grid upgrade works are completed. A temporary diesel storage tank will also be installed to supply this generator. The location of this temporary diesel infrastructure will be determined as the design process is progressed.

3.2.7 Services and Drainage

Electricity and/or water provision will be installed as part of the CFIIS to service the overnight berthing structure, slipway, purser's kiosk and scheme lighting.

Potable water is required for periodic washdown of the overnight berthing structure and the slipway. Potable water bunkering is also required to service the ferry vessels. Potable water will be accessed via the existing network and include a suitable break-water tank and pump unit.

As mentioned previously, upgrade to the grid is required for electrical power supply for the NEV charging during the operational phase, and any infrastructure required for the upgrade will be provided by SSEN. The CFIIS includes the installation of electrical infrastructure from the SSEN electrical grid, including the installation of cables, ducting, drawpits, switchboard(s) and feeder pillar(s). Precise locations for this infrastructure will be determined as the design process progresses, although it is currently assumed a feeder pillar will be required adjacent to the sub-station at the end of North Corran and/or on the overnight berthing structure. Switchboard(s) are anticipated to be located either in the yard of the ferry office or on the overnight berthing structure.

Sections of existing de-energised sub-sea cabling will require removal from within the footprint of the proposed works. The terminals, which will be cut and capped, will be anchored to be seabed, below dredge depth, to prevent unrestricted movement.

Lighting for the scheme infrastructure outlined above will be designed and implemented in accordance with appropriate guidance to meet health and safety requirements and also to minimise unnecessary light pollution. Appropriate drainage will be designed and installed for surface water management of hard surfaces and include a bypass separator before discharging into the adjacent sea. Street furniture, road-markings and signage will also be installed where required.

3.3 Development on the Nether Lochaber Side

Development on the Nether Lochaber side of the Narrows will predominantly take place north of Corran in an area of woodland between Loch Linnhe and the A82. Refer Drawing 2387-WS-ZZ-NL-DR-C-5101 P02.

3.3.1 Slipway

Ardgour development will include the construction of a 1:8 gradient concrete slipway surface, supported on side walls, constructed from infilled precast concrete and in-situ pours. The slipway is to be accessed via the new marshalling area (refer Section 3.3.3: Marshalling Area).

3.3.2 Breakwater and Alignment Structure

A solid breakwater will be constructed on the south-west side of the slipway and fitted with a steel framework and fendering on the berth face to support the vessel (i.e. the alignment structure). The alignment structure will hold the vessel in position on ebbing tide. Rock armoured protection will be placed on the southern face and west end of the breakwater. The breakwater protects the vessel from the forces of the flood tide.

To ensure there is sufficient water depth for unrestricted access to the slipway in all tidal conditions, the works require dredging of the seabed to the seaward and the north of the slipway structure. Where suitable, dredge arisings shall be retained and reused on site as fill for structures and/or land reclamation. Unsuitable arisings may need to be disposed of at a suitable licenced dredge disposal site.

3.3.3 Marshalling Area

New marshalling lanes of increased capacity and dedicated entrance and exit lanes will be constructed within the marshalling area on the Nether Lochaber side of the Narrows. This will be located on an area created by levelling the existing land and reclaiming an area from the adjacent foreshore. The levelled area will be notably lower than the existing A82. As such there is a need to install suitable slopes separating the elevations between the lower marshalling area and the higher verge along the western edge of the A82. The land reclamation will have rock armour installed on the seaward faces where these are impacted by tidal forces.

3.3.4 Access Road and Junction

An access road will connect the marshalling lanes to the A82 trunk road. This requires the development of a suitable new road junction with the existing A82 and will require the re-alignment of a section of the A82 to ensure appropriate approaches are constructed for vehicles accessing, egressing and travelling through this junction.

3.3.5 Car Park

A car park area will be constructed on the eastern side of the marshalling lanes. As well as typical car parking spaces, this area will also include provision for oversize vehicles and disabled parking access. The car park will include EV charging stations, initially two charging units are planned with the capacity to charge 4 cars at a time.

3.3.6 Purser's Kiosk

A small, prefabricated cabin on a concrete base, termed the 'purser's office' is anticipated to be located between the head of the slipway and the marshalling lanes. The structure will provide shelter and storage for essential items (i.e., first aid kit) for the ferry staff managing the interface between the loading/unloading of the vessel and the marshalling area.

3.3.7 Toilet Block

A new toilet block will be installed and will include a changing places facility. The foul drainage will be connected to the Scottish Water wastewater network at Corran or feed a new septic tank.

3.3.8 Bicycle Shelter

A bicycle shelter will be installed near the car park.

3.3.9 Shared-use Path

A path for pedestrians and wheeler access will be constructed from the new slipway to follow the western edge of the new junction and the A82, to connect with the existing footway/cycleway adjacent to the north-bound bus stop at Corran. This shared-use path will therefore retain the active transport link to the ferry service which is also part of the National Cycle Network. The path will be segregated from the A82 by a suitable verge buffer.

The path will be bituminous surfaced with slopes and/or retaining wall edges and must span over several existing burns which cross the A82 via culverts.

3.3.10 Services and Drainage

Electricity and/or water provision will be installed as part of the CFIIS to service the toilet block, purser's kiosk, washdown point, slipway and scheme lighting.

Potable water is required for periodic washdown of the overnight pier and the slipway. Potable water bunkering is also required to service the ferry vessels. Potable water will be accessed via the existing network and include a suitable break-water tank and pump unit. Appropriate drainage will be designed and installed for surface water management of hard surfaces. As mentioned, the new toilet, including changing places facility on the Nether Lochaber side will be connected into the local Scottish Water network or feed a new septic tank.

A suitable cable route, including ducting and draw-pits will be required to be constructed between the new infrastructure of the CFIIS and the SSEN network. The network tie in is anticipated to be at a feeder pillar adjacent to a sub-station within the field area at the end of North Corran cul-de-sac. It is expected that the cable route will be via the farmer's gate, through the ferry office garden area and beneath the A861.

Lighting for the scheme infrastructure outlined above will be designed and implemented in accordance with appropriate guidance to meet health and safety requirements and also to minimise unnecessary light pollution.

Appropriate drainage will be designed and installed for surface water management of hard surfaces and include a bypass separator before discharging into the adjacent sea. Street furniture, road markings and signage will also be installed where required.

3.4 Construction Phase

The construction phase of the CFIIS is currently programmed to start mid to late 2025, with completion planned for the end of 2026.

3.4.1 Construction Compounds

Construction compounds on either side of the Narrows will be established within the Scoping boundary south of the development as depicted in Drawing 99_DRG_15_1.

The construction compound at Ardgour is anticipated to be established south of the village of Ardgour, with access from the A861 near the Corran Point Lighthouse.

On the Nether Lochaber side, a construction compound is expected to be established south of the village with access off the A82. This compound will support preliminary access works into the woodland area north of the village, until a site compound can be established in the footprint of the development.

Establishing these compounds is expected to involve a small area of ground vegetation clearing and the formation of a hard standing area. Construction compounds will provide:

- Site office cabins;
- Welfare cabins for construction personnel (potentially powered by diesel generators or connected to the power grid where possible);
- Segregated waste facilities;
- Mobile lighting trailers;
- Laydown areas for the storage of equipment and materials;
- Storage units for storage of equipment and materials;
- Parking areas for workers, machinery and mobile equipment; and
- Security fencing and gates.

3.4.2 Construction Methods

This section outlines the techniques to be utilised during the construction phase of the CFIIS. These will be considered within the CFIIS EIA. Construction techniques that have been considered throughout this report to understand the potential sources of impacts are as follows:

- Vegetation clearance – including the removal of approximately 2.1 hectares (ha) of woodland;
- Soil stripping – standard construction techniques employed to remove soil overburden;
- Vibration and impact piling - to install the overnight berthing structure, to install the Ardgour slipway structure and possibly to secure cut and capped subsea cables ends to the seabed;
- Rock stripping and possible rock blasting – potentially required onshore and offshore on the Nether Lochaber side for the creation of the marshalling area/car park, to achieve appropriate water depths at the slipway and provide a suitable toe for the breakwater structure. Although blasting is a last resort, its use has been included within this report to ensure impacts are considered;

- Rock crushing and processing – rock will likely be processed for re-use in the scheme as fill material;
- Dredging activities – to create sufficient water depths at the overnight berthing structure, slipway on the Nether Lochaber side and the breakwater toe. Techniques may include backhoe, mechanical excavation, ripping and plough dredging on either side of the Narrows.
    - A backhoe dredge technique (i.e., a pontoon mounted excavator supported by a hopper barge) is likely to be the primary technique utilised at Ardgour;
    - A bund mounted excavator/ripper supported by land based plant is the most likely technique anticipated for dredging on the Nether Lochaber side;
- Dredging disposal activities - where characterises are suitable, dredge spoil will be preferentially utilised within the scheme development, as infill or rock armoured protection. Any alternative disposal or reuse of dredge spoil will be informed by a Best Practicable Environmental Option (BPEO) assessment.
- Earthworks activities - including excavation, infilling, compaction and grading with mobile plant;
- Land reclamation and rock armour placement - constructed by installing rock armoured slopes on rockfill material. Where necessary, a negative buoyancy geotextile may be utilised to prevent rockfill material from migrating through rock armour layers. Infill material will be compacted and graded ready for surfacing;
- Concrete works – both in situ (with formwork shuttering) and precast concreting activities may be included in the scheme. All concrete to be poured in the marine environment (e.g., for the slipways) will utilise marine compatible concrete mixes;
- Road construction - standard traffic management and road construction techniques including compacting aggregates followed by the laying of bituminous surfacing;
- Cut and cap cable removal techniques – sections of the redundant SSEN sub-sea power transmission cables will be removed where the cables (or associated exclusion zones) conflict with the construction footprint at Ardgour. This is likely to include lifting part of the cable above the water utilising a vessel with a winch, cutting the cable and capping (sealing) the exposed end, then securing the capped end of the cable to the seabed. Securing the cable on the seabed is anticipated to include a piled restraint with a concrete cap;
- Hot cutting/grinding – may be used to remove the existing small pier at Ardgour;
- Pile removal – piles that form the existing small pier at Ardgour will be removed, most likely utilising the vibrating piling rig from a barge, with the aim to remove the full piles from the seabed. If full removal is not achievable, piles may need to be cut off just below seabed level. Where possible, materials arising from demolition (i.e. rockfill from the pier head) shall be reused within the works; and
- General construction activities – activities include, but are not limited to, building construction for the toilet block, installation of prefabricated cabins for the purser's kiosks, installation of associated services, construction of a retaining wall, deliveries of heavy plant, machinery and materials using Heavy Goods Vehicles (HGVs) by land and vessels by sea, other small ancillary works such as the installation of street furniture, road markings and signage.

3.4.3 Reinstatement

The footprint required for construction will be larger than the footprint of the final infrastructure as built, however, the area required for construction activities will be minimised where possible to reduce unnecessary disturbance. Areas of land no longer required for the project will have topsoil reinstated, levelled or graded to tie into the surrounding terrain and seeded or planted for habitat regeneration. All other materials and waste will be removed from the area. Progressive reinstatement will be undertaken where practicable so that reinstatement may be completed throughout the construction phase when areas become available. Compensation planting and biodiversity enhancement initiatives as part of reinstatement will be considered within the EIA and Biodiversity Enhancement and Management Plan (refer Section 13: Terrestrial Ecology and Ornithology).

3.5 Operational Scenarios

As mentioned previously, THC are seeking to commission a 'straight through' NEV specifically for the Corran crossing. This NEV and the new infrastructure constructed for the CFIIS will work in combination to increase ferry service capacity and resilience.

As the CFIIS facilitates the introduction of the NEV, ferry operations are described here for context. The 32-car NEV is intended to replace the 28-car capacity MV Corran as the primary service vessel on the Narrows whilst the 28-car capacity MV Corran replaces the 14-car capacity MV Maid of Glencoul as the standby vessel. The NEV will therefore increase capacity in each sailing by 15% compared to the MV Corran, thereby facilitating the movement of more vehicles per crossing and reducing vehicle wait times and potential for back-up onto the adjacent road network. As mentioned in Section 2.6: Development Description, it is envisioned the NEV will move from a timetabled service to a shuttle service in peak times, as per current operations of the MV Corran. It is envisaged that the ageing MV Maid of Glencoul will be retired from the Corran Ferry service.

Note, the MV Corran will require modification of its quarter ramps to allow it to move from operating on the existing 1:10 slipway ramps to the new 1:8 slipway ramps. These vessel ramp modifications are out of scope of the CFIIS.

The main activities associated with the ferry service will not change due to the CFIIS. The following activities will be very similar to what they are currently, although their location may change:

- Vessels transit between the slipways on Nether Lochaber and Ardgour sides of the Narrows on a timetable or in shuttle-mode at peak times;
- Vehicle, passenger and cyclist loading to vessels via the slipways;
- Vehicle, passenger and cyclist access and use of the slipways and marshalling areas;
- Day-to-day vessel and infrastructure maintenance, including monitoring inspections, servicing, refuelling and wash-down; and
- The ferry office building and storage building (Cuil Righ) at Ardgour will continue to be utilised (with no change in location).

The CFIIS will introduce the following changes to operations:

- Vessels will be berthed on the overnight berthing structure when not in use, as opposed to moored on the off-shore swing mooring, eliminating the need for vessel-to-vessel transfers of personnel;
- The NEV will be charged at the overnight berthing structure via the electrical network (potentially utilising diesel infrastructure in the short-term pending any necessary upgrades to the existing power network);
- The new overnight berth provides the potential for a 'fair-weather' berth on the North side of the pier head;
- Ferry service route will lengthen slightly from approximately 420m to an estimated 550m and be located approximately 150m north from the existing route.
- Marshalling areas are significantly increased on the Nether Lochaber side providing significantly increased capacity to mitigate the impacts of peak periods and their potential to impact the adjacent trunk road network;
- A new road junction on the A82 will considerably improve the approach and access to ferry infrastructure for all vehicles compared to the existing junction;
- Water bunkering activities may be carried out on the overnight berthing structure;
- The purser's kiosks will provide improved welfare facilities for shore-based ferry personnel;
- Additional facilities will be provided on the Nether Lochaber side including a changing places toilet, parking, cycle shelter and EV charging facilities;
- Maintenance dredge activities may be required to ensure water depths are maintained on the Ardgour side, though these are expected to be infrequent; and
- New slipways facilitate the potential for access by additional vessel types (i.e., Caledonian Maritime Assets Limited's (CMAL's) 'Loch Class' ferries) on the route from time to time, if required.

The NEV is anticipated to have an operating life of 30 years. There is, at present, no plans to discontinue the Corran Ferry service. There is however, an aspiration for a fixed link at Corran Narrows (as discussed in Section 2.5: Alternative Crossing Options), which would essentially render the service redundant. The future of the CFIIS under this scenario is discussed in Section 3.6: Decommissioning.

3.6 Decommissioning

The CFIIS will result in a diversion of operations away from the existing slipway at Ardgour and the existing slipway, carpark and toilet facilities at Corran. This infrastructure is proposed to be retained, primarily as a contingency for the lifeline ferry service and also because it is understood the infrastructure will still provide benefit to local communities.

Access and use of the existing slipways at Ardgour and Corran will be maintained in the short to medium term in part for the operational service of the MV Maid of Glencoul. The MV Maid of Glencoul will remain as a back-up vessel for the Corran Ferry service until the NEV is fully operational on the route, however, she will be unable to operate safely on the new 1:8 gradient slipways. As a result, the existing toilet block, car park and cycle shelter at Corran may continue to be utilised by ferry service passengers in the short to medium term.

Even beyond the service lifetime of the MV Maid of Glencoul, the existing slipways are proposed to be retained for use or re-purposed by local communities and THC. These concrete

surfaced, sheet-piled and infilled slipways do not readily deteriorate and hence there is low risk of their causing any detrimental impacts to the local environs. THC will continue to manage access to slipways and have proposed the use of access gates following the introduction of the NEV, if required.

The existing carpark, toilet block and cycle shelter at Corran are also proposed to be retained during and beyond the operational phase of the CFIIS for the amenity these facilities provide. These facilities are frequently used by tourists, pulling off the A82 for a rest stop and to enjoy the scenic outlook. The carpark can also act as overflow parking for local businesses, such as the Corran Bunkhouse and has the potential to be converted into an overnight parking area with additional picnic tables, encouraging the use of this public space. A potential change of use would be subject to a separate planning application and is not considered part of the CFIIS project.

The CFIIS infrastructure will be designed and constructed for a design life of 50 years in line with Category 4 'Marine Structures' of British Standard (BS 6349), assuming appropriate maintenance during operations. A 50-year design life exceeds the anticipated lifespan of the proposed NEV and greater than that of the proposed standby vessel, the MV Corran. As discussed in Section 2.5: Alternative Crossing Options, a fixed link across the Narrows remains an aspiration for THC, and the infrastructure of the CFIIS in no way precludes a future fixed link crossing option. If a fixed link is delivered in future, the CFIIS infrastructure will be able to be re-purposed. The overnight berthing structure at Ardgour may be suitable for providing berthing for leisure craft or commercial vessels (e.g., fish farm boats). The slipways could be utilised for launch/recovery of small vessels. The CFIIS marshalling and car park on the Nether Lochaber side could be re-purposed as overnight parking and/or public open space for leisure activities. The scenic viewpoints down the glen make this an attractive opportunity.

As such, whilst existing infrastructure at both Ardgour and Corran may no longer be required to support the ferry service in the longer term, this infrastructure has value in supporting local businesses, fish farm activities, recreation and tourism.

Under the long term scenario where the proposed infrastructure is truly redundant and required for removal, demolition techniques will predominantly be a reversal of construction techniques (described in Section 3.3.1: Construction Methodology). Any potential environmental effects associated with demolition or decommissioning are therefore reasonably expected to be equal to (or less than) those associated with construction, which will be assessed in the EIA. Subsequently, all decommissioning or demolition activities beyond the design life of the infrastructure are not considered to warrant a separate impact assessment and will be **scoped out** of the EIA.

4 Consenting and Policy Context

4.1 Consenting

Construction of the proposed CFIIS will fall under two main legislative acts, the Marine (Scotland) Act 2010 and the Town and Country Planning (Scotland) Act 1997, which require compliance with underpinning regulations. The main regulatory instruments are discussed here but this list is not exhaustive. In addition, there may be further licences and consents required to facilitate construction and operations.

4.1.1 Planning Consent

As the CFIIS involves new development above MLWS and the making of material change in the use of any buildings or other land, planning permission will be required under The Town and Country Planning (Scotland) Act 1997, as amended.

An EIAR and PAC process will be required to support the planning permission application as discussed in Sections 4.1.3 and 4.1.4 respectively.

4.1.2 Marine Licensing

A number of activities listed under Part 4; Section 21 of the Marine (Scotland) Act 2010, as amended, require a Marine Licence. The CFIIS includes activities involving the deposit or removal of substances or objects in the sea, either on or under the seabed, and activities to construct, alter or improve any works in or over the sea or on or under the seabed. Hence, marine elements of the scheme are subject to marine licensing and the project will therefore require the following licences to be issued by Marine Directorate Licensing Operations Team (MD-LOT):

- Licence to construct, alter or improve works in the Scottish Marine Area (SMA); and
- Licence to carry out any form of dredging and deposit any substance or object in the SMA.

An EIAR and PAC process will be required to support the marine licence application as discussed in Sections 4.1.3 and 4.1.4 respectively.

4.1.3 Environmental Impact Assessment

To determine whether an Environmental Impact Assessment (EIA) is required, developers may request a Screening Opinion from the relevant consenting authority under Regulation 10(1) of the Marine Works (EIA) (Scotland) Regulations 2017, as amended, and/or Regulation 8(1) of the Town and Country Planning (EIA) (Scotland) Regulations 2017, as amended. For the purpose of this report, the Marine Works (EIA) (Scotland) Regulations 2017, as amended, and the Town and Country Planning (EIA) (Scotland) Regulations 2017, as amended, will hereafter be referred to as the 'marine EIA regulations' and 'terrestrial EIA regulations' respectively.

The CFIIS project team understood the proposal would constitute an EIA development under item 10(g) of Schedule 2 of the marine and terrestrial EIA regulations; construction of a harbour or port installation exceeding 1 ha. Confirmation was requested from THC Planning on 25th July 2023, for which a positive Screening Opinion was received on 16th August 2023 that an EIA would be required to support the planning application.

In consideration of both THC's Screening Opinion and managing the risks of the project, the CFIIS project team have elected to undertake and submit an EIA for both terrestrial and marine elements of the proposal. The submission of an EIA to the MD-LOT, subsequently qualifies the proposal as an EIA development under item 7(2)(b) of the marine EIA regulations. Hence, a single EIAR will be submitted to support both the Planning Permission and Marine Licence applications.

4.1.4 Pre-application Consultation

PAC is a requirement to support a planning consent application and/or marine construction licence application for developments that meet certain criteria. The PAC process is established to ensure effective stakeholder and community consultation.

The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 prescribes that projects above MLWS and which are classified as 'Major Developments' require PAC. 'Major Developments' are defined by The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009. The CFIIS is understood to qualify as a project requiring PAC under The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009 due to:

- The area of the site is or exceeds 2 ha above MLWS, i.e. constituting a 'Major Development'.

The Marine Licensing (Pre-Application Consultation) (Scotland) Regulations 2013 prescribe the marine licensable activities that are subject to PAC and, in combination with the Marine (Scotland) Act 2010, set out the nature of the pre-application process. The CFIIS qualifies as a project requiring PAC because it will incorporate:

- A deposit or object within the Scottish marine area for the purposes of reclaiming land; and
- Construction of works within the Scottish marine area that exceeds 0.1 ha.

Subsequently, the scheme is required to go through the PAC process to meet the requirements of both marine and planning PAC regulations. The project team will give notice to THC Planning Department in the form of a Proposal of Application Notice in accordance with item 35B(2) of the Town and Country Planning (Scotland) Act 1997, as amended. A PAC Report, incorporating a summary of consultation activities and outcomes will be submitted to support the marine licence and planning consent applications.

4.1.5 Crown Estate Licence

Under the Scottish Crown Estate Act 2019 (The Act), The Crown Estate owns the Scottish territorial seabed out to 12 nautical miles (NM). The Crown Estate issues licences, leases, and consents for various marine works including (but not limited to) ports and harbour development, dredging and dumping of material, laying cables and pipelines, coastal protection and flood defence works and deployment of monitoring equipment.

Authorisation from CES in the form of a Marine Works Licence may be required for the subsea cable removal works, dredging and re-use or disposal of spoil, and construction of marine infrastructure and land reclamation.

4.1.6 Habitats Directive

The European Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, also referred to as the 'Habitats Directive', has the primary aim of maintaining biodiversity within Member States. The Habitats Directive is transposed into Scottish law by a combination of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland) and the Habitats Regulations 2010 (in relation to reserved matters). These are commonly known as the 'Habitats Regulations'.

The Habitats Regulations identify several habitats or species whose conservation interest requires the designation of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), which form a set of protected sites within the United Kingdom (UK) National Network.

In addition, the Habitats Regulations make it an offence to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 4. These listed species are commonly termed European Protected Species (EPS). Actions in relation to EPS can be made lawful through the granting of derogation licences. The licences are granted by the relevant authorities.

4.1.6.1 Habitats Directive

A Habitats Regulations Appraisal (HRA) will be required for the CFIIS due to its proximity to multiple sites within the UK Site Network, namely SACs and SPAs. The legislative context for this requirement is incorporated within Article 6(3) of the Habitats Directive (92/43/EEC) and Article 4(4) of the Birds Directive (2009/147/EC) and is implemented in Scotland through the Habitats Regulations.

An Appropriate Assessment (AA) is part of the HRA process and is required when a plan or project potentially affects a site on the basis of 'likely significant effects' (LSEs).

An AA must demonstrate that there will be no adverse effect on site integrity, nor on the conservation objectives of the designated site. Should this requirement not be satisfied, a project would only receive consent if:

(1) Imperative Reasons of Overriding Public Interest (IROPI) are proved; and
(2) There are no satisfactory alternatives.

It is responsibility of the competent authority to determine whether there are any LSE and therefore whether an AA is needed for relevant designated sites. To inform this process, a HRA Supporting Document considering sites that could be affected by the development will be provided. This Supporting Document will provide sufficient information to allow the competent authority to undertake a HRA (and an AA, if required). This Supporting Document will be provided as part of the consent application.

4.1.6.2 European Protected Species Licence

If it is determined that the development or construction activities will likely affect EPS listed under the Habitats Regulations, which includes cetaceans and European otter, an EPS Licence will be required. An EPS licence will only be granted if it is proved that:

(1) The project IROPI can be proven;
(2) There are no satisfactory alternatives; and

(3) The proposed action must not be detrimental to the maintenance of the species at 'favourable conservation status'.

The construction techniques likely to be utilised for the CFIIS have potential to disturb cetaceans, and licensing will be required. This is discussed further in Section 14.2: Marine Mammals. In addition, with evidence of European otter known in the area, consideration will also be given with regard to otters. Otter are considered further in Section 13: Terrestrial Ecology and Ornithology.

4.1.7 Water Framework Directive

The Water Framework Directive (WFD) (Directive 2000/60/EC of the European Parliament) is transposed into Scottish law through the Water Environment and Water Services (Scotland) Act 2003 (WEWS Act). The directive aims to achieve a good quality status for all rivers, lochs, transitional waters (estuaries), coastal waters groundwater and groundwater dependant wetlands. As such, the main aims of the WFD are to:

- Prevent deterioration and enhance status of aquatic ecosystems, including groundwater;
- Promote sustainable water use;
- Reduce pollution; and
- Contribute to the mitigation of floods and droughts.

To assess the impact of any development or activity on a water body, especially those which may pose a risk of reducing the quality status of a water body, a WFD assessment is required. A WFD assessment should demonstrate if the development will:

- Cause or contribute to deterioration of status; and/or
- Jeopardise the water body achieving good status.

A WFD assessment will be required for the CFIIS. Details of the assessment are discussed in greater detail in Section 10: Water Quality.

4.1.8 The Water Environment (Controlled Activities) (Scotland) Regulations (CAR) 2011 (as amended)

Under the Water Environment and Water Services (Scotland) Act 2003 Act, the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (hereafter referred to as 'CAR') apply regulatory controls over activities which may affect Scotland's water environment. CAR covers activities relating to point-source and diffuse discharges, water abstraction, engineering within inland waterways and groundwater works which could impact upon water courses and water bodies including: rivers, lochs, estuaries, coastal waters, as well as groundwater and groundwater dependant wetlands. Activities are controlled by the SEPA under General Binding Rules (GBRs), registration and licence level authorisations. While CAR does not apply to projects authorised by a Marine Licence, construction works above MHWS affecting the water environment and any permanent discharges to water from the CFIIS will fall under CAR. Furthermore, relevant GBRs should be followed, where appropriate, to minimise pollution risks in line with construction best practice.

4.2 Policy Context

This section outlines the main policies relevant to the proposed CFIIS. Where policies from the National Planning Framework 4 (NPF4), Highland-wide Local Development Plan (HwLDP), West Highland and Islands Local Development Plan (WHILDP), Scotland's National Marine Plan (NMP), Planning Advice Notes (PANs) and Technical Advice Notes (TANs) are relevant to a specific environmental topic, they are mentioned in the relevant sections within this document.

4.2.1 Scottish Government Net-Zero and Decarbonisation Targets

In 2019, Scotland committed to achieving net-zero GHG emissions by 2045 through the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. This commitment will require the decarbonisation of all sectors, including industry. To address decarbonisation in industry, initial targets up to 2032 were established in the 2018 Climate Change Plan (CCP). The current CCP identifies seven key sectors, including transport, and a summary of their targets/policies to contribute towards net-zero. The commitment to net-zero and the targets/policies of the CCP were key factors in the business case for a new vessel to be electric, and the associated requirement for vessel charging infrastructure.

4.2.2 Planning Policies

The development planning system in Scotland, which provides the framework for considering planning applications, is made up of two main documents:

- The National Planning Framework (NPF); and
- Local Development Plans (LDPs).

The NPF4 sets out the strategy for long-term development within Scotland. It was published in February 2023 and sets out the strategy for development for the next 20 years (Scottish Government, 2023). Relevant policies for CFIIS which will be used to support the EIA are identified in individual topic sections.

The relevant LDPs are the HwLDP (THC, 2012) and the WHILDP (THC, 2019). Of note, the Corran crossing is specifically outlined in the HwLDP for 'improved ferry connection'.

With the adoption of NPF4, THC's website states this will likely lead to a reduction in the number and range of policies required in LDPs and that a review of the LDPs is planned. Although there are to be new arrangements for LDPs, policies of the HwLDP and WHILDP are still in place. Hence, relevant policy considerations will be considered in the EIAR.

The Scottish Government also provides advice and technical planning information in the form of PANs and TANs. The key principles of PAN 1/2013 Environmental Impact Assessment, namely integration, proportionality and efficiency, have been utilised to inform the scoping approach (refer Section 1.2: Scoping Methodology) and will be likewise used for the development of the EIA. Relevant PANs for CFIIS which will be used to support the EIA are identified in individual topic sections.

4.2.3 Scottish National Marine Plan

As the CFIIS is in part below MHWS and within 12 NM of the Scottish Coastline, it falls within the remit of the Marine (Scotland) Act 2010 and the 2015 Scottish National Marine Plan (NMP) covering inshore waters as required by the Act (Scottish Government, 2015a). The NMP lays out the Scottish Minister's policies for the sustainable development of Scotland's seas and

provides General Planning Principles (GENs) and sector-specific policies, most of which apply to the construction and operations of CFIIS. In addition, there are a series of Good Environmental Status (GES) descriptors within Scotland's NMP.

It is noted that work is underway on Scotland's National Marine Plan 2 (NMP2). The status of NMP2 will be monitored and if there are any new or different policies relevant to the development then these will be considered within the EIAR.

GESs and GENs are specific to environmental topics and as such, are detailed in the relevant sections within this report. In addition, the following marine planning policies in the NMP are also considered for this project:

- TRANSPORT 5 - climate and sea level projections should be taken into account in the design of any new ports and harbours, or of improvements to existing facilities; and
- REC & TOURISM 4 – provides support to proposals that incorporate opportunities to share infrastructure with recreational users.

5 Cumulative Impacts

Cumulative Impact Assessment forms part of the EIA process, although it is recognised that this can be a complex process to implement. Existing built developments will form part of the baseline for assessment within various chapters of the EIA, however, it is necessary to take into account future unrelated developments that may give rise to cumulative impacts.

As the number and nature of cumulative impacts may change between the submission of this report and subsequent submission of the EIA, this section only states how potential cumulative impacts associated with the CFIIS are proposed to be assessed within the EIA.

5.1 Methodology

IEMA suggest a useful ground rule for cumulative impact assessment, which will be applied in the production of the CFIIS EIAR:

- Developments already built and operational are excluded from cumulative impact assessment, as they are included within the EIA environmental baseline;
- Projects that are consented but not yet developed or are within the consenting process need to be considered; and
- Projects that are earlier in the process (i.e. prior to consent submission) can be discounted, as the developer of that project will be responsible for considering the effects of other projects in their own consent applications, and there is unlikely to be sufficient information to make a meaningful assessment.

Based on the nature of a topic-specific assessment and dependent on the geographical zone of influence for individual effects, consideration of the potential for cumulative impacts will reasonably vary between topics. All assessments will consider the potential cumulative impacts, in accordance with the EIA Regulations, and the extent of each assessment will be defined within each topic-specific chapter of the EIAR. The terminology that will be used to describe cumulative effects, as adopted by IEMA, is as follows:

'Additive Effects are those that result from additive effects caused by other past, present or reasonably foreseeable actions together with the plan, programme or project itself; and

Synergistic Effects which arise from the reaction between effects of a development plan, programme or project on different aspects of the environment (IEMA, 2020a)'.

Factors considered in scoping other projects in or out for cumulative impact assessment include connectivity, pathways, receptor locations and effect ranges. Once projects that may give rise to cumulative impacts have been identified (as per Sections 5.1.1 and 5.1.2), a review of their potential effects will be completed to understand whether they could have impacts upon the same receptors as the CFIIS. Cumulative assessment will be considered for the relative topic areas utilising the information publicly available for the relevant projects. The outcome will be recorded within the CFIIS EIAR, presented on a topic-basis, with cumulative assessment considered for each relevant topic area. Where required, mitigation measures will be outlined under each of the topics assessed within the CFIIS EIA.

5.1.1 Onshore Developments

Terrestrial developments will be identified through a review of the Highland Council ePlanning web portal. As a general rule, these are anticipated to include developments of the following nature:

- Major developments close enough to have impacts on the same receptors; and
- Potentially non-major developments in the immediate vicinity of the proposed development, which could impact upon the same receptors. It's noted that this is unlikely to include residential alterations or developments of less than 3 houses.

A review conducted in March 2024 has identified only one project within the categories above, the Choire Nam Muc Hydropower Scheme. This hydropower scheme was consented in 2019 (planning reference: 17/01675/FUL), with construction initially planned for 2023/2024 and the potential to become operational in 2024/2025. The need to assess cumulative effects will be considered within the EIAR.

5.1.2 Marine Developments

At the time of preparing this Scoping Report, there are currently no marine developments that have been identified as having the potential for significant cumulative effects.

Marine developments for consideration in the EIA will be identified through a review of both the Highland Council ePlanning web portal and the Marine Directorate's register of current projects. As a general rule, these are anticipated to include developments of the following nature within Loch Linnhe:

- Ports and harbour developments;
- Aquaculture developments; and
- Recreational marine developments.

6 In-Air Noise and Vibration

Environmental, or community noise is a broad term that encompasses noise emitted from many sources, including road, rail, marine and air traffic, industry, construction, public work and neighbourhood noise. All of these sources potentially contribute adversely to the overall noise environment. It is therefore reasonable to expect communities to be sensitive to any deterioration in their acoustic environment as a result of a proposed development.

The proposed CFIIS will introduce temporary new noise and vibration sources into the local area in the form of construction plant and activities, and permanent new noise sources in respect of battery charging of the NEV. This section consequently considers the potential for adverse noise and vibration impacts to occur from the construction of the development, and from operational noise in relation to power generation/storage for NEV charging. Variations in noise levels from the existing noise environment may also occur as a result of moving existing noise sources to new locations, for example, use of the new marshalling area on the Nether Lochaber side and vessel loading of vehicles at both new slipways. Hence, these changes are also considered.

It is recognised that, although the NEV is out of scope for the project, the electric propulsion of this vessel will reduce operational noise as the electric battery will be considerably quieter than the diesel engines of the existing diesel powered vessels.

For environmental assessments, 'noise' typically refers to airborne noise, whilst vibration can be thought of as ground-borne noise. For the remainder of this section, unless specified, the term 'noise' refers to both airborne noise and vibration.

Note, the potential for in-air noise and vibration effects on terrestrial species are considered in Section 13: Terrestrial Ecology and Ornithology. Underwater noise and vibration is considered separately in Section 7.

6.1 Legislation, Policy, Guidance and Resources

The overarching European legislation in relation to terrestrial environmental noise is the 'Environmental Noise Directive' (END). The END aims to limit people's exposure to environmental noise but does not prescribe noise limits. Instead, it requires each member state to provide data on noise exposure, and to develop action plans to prevent or reduce noise exposure and to preserve existing quiet areas. Although the UK has now left the EU, this requirement is still in place as the END is transposed and implemented within 'The Environmental Noise (Scotland) Regulations'.

At a national level, the relevant policy documents include:

- Planning Advice Note (PAN) 1/2011 – 'Planning and Noise,' (Scottish Government, 2011a); and
- Technical Advice Note (TAN) – 'Assessment of Noise' (Scottish Government, 2011b).

PAN 1/2011 provides little guidance in respect of construction noise, other than recommending that the use of planning conditions is not the preferred method for controlling temporary construction noise. Specifically, the document states:

"32. While planning conditions can be used to limit noise from temporary construction sites, it is most effectively controlled through the Control of Pollution Act 1974 (COPA74) and the Pollution

and Prevention Control Act 1999 for relevant installations. Notice can be served in advance of works and site conditions set to control activities."

Guidance relevant to noise and vibration associated with the CFIIS includes:

- BS 5228:1997 and BS 5228:2009 'Noise and vibration control on construction and open sites' (BSI, 1997; BSI, 2009);
- BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound';
- Design Manual for Roads and Bridges (DMRB) (National Highways *et al.*, 2024); and
- Pre-application Advice for Major Developments pack (THC, 2023a).

The 'Code of practice for basic information and procedures for noise and vibration control' parts 1 to 5 (BSI, 1997) is the approved Code of Practice under COPA74, however, it is the 2009 version of the Standard that should be used for planning applications.

The BS 5228:2009 standard provides useful guidance on practical noise control. Part 1, provides recommendations for basic methods of airborne noise control including sections on community relations, training, occupational noise effects, neighbourhood nuisance and project supervision. The annexes provide information on noise sources, noise calculation procedures, mitigation measures and their effectiveness. Part 2 provides similar guidance for vibration.

BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' (BSI, 2019) is an appropriate method of assessment for fixed plant and is a recognised standard within PAN 1/2011 and the associated TAN. It should be noted, however, that BS 4142 is suitable only for the assessment of residential receptors and so an alternative method of assessment will need to be agreed if any non-residential receptors are identified.

6.2 Baseline

A desktop survey has been undertaken to identify the location of the nearest groups of Noise Sensitive Receptors (NSRs) within the vicinity of the project. Ardgour is a small settlement of approximately 30 houses, the Inn at Ardgour and the Corran Point Lighthouse. Corran is a similarly small settlement containing approximately 7 'shorefront' houses west of the A82 trunk road, the Corran bunkhouse short stay accommodation and The Corran (serviced accommodation). Corran also includes another 7 or so houses up the hill, east of the trunk road. As such, NSRs in these settlements consist of residential housing, short-stay accommodation and the Corran Point Lighthouse. Locations of these NSRs are depicted in Drawing 99_DRG_08_1 in relation to an indicative development boundary. All identified NSRs are in the vicinity of the existing ferry infrastructure and ferry operations, and hence subject to a level of operational noise impacts in the current state.

6.3 Potential Construction Impacts

Construction noise is expected to result primarily from the following activities:

- Rock stripping and possible rock blasting;
- Rock crushing and processing;
- Vibration and impact piling;
- Dredging activities;
- Hot cutting/grinding;

- General construction activities; and
- Construction traffic.

Construction noise levels will vary throughout the construction period as construction activities, plant and locations vary. Construction noise effects would be temporary in nature, although the construction period is anticipated to last 12-18 months, so noise effects do have the potential to be significant if not considered and controlled appropriately.

Note, blasting is not the preferred method of marine or terrestrial rock removal, however, it may be required in certain circumstances. The magnitude of blasting cannot be determined at this stage, however noise impacts from blasting will be of very short duration and are expected to be managed via communications to local stakeholders. Furthermore, it is in the interest of the blast engineer to minimise air-overpressure (noise) to increase the efficiency of the blast.

Until the required construction methods are further refined, it is not possible to determine the likelihood for significant vibration effects, however, appropriate vibration level limits for the nearest residential receptors can be adopted within the EIA to ensure no adverse vibration impacts should occur (refer Section 6.5: Mitigation).

6.4 Potential Operational Impacts

Operational noise impacts would be temporary and permanent in nature and so careful consideration has been given to the siting of operational activities.

The potential introduction of temporary plant (e.g., a diesel generator) will contribute additional noise to the local soundscape and so an assessment will be required in accordance with BS 4142 to determine the extent of any required mitigation. Note, whilst the NEV itself is not within the consenting scope, it is recognised that charging of the vessel's onboard batteries is facilitated by the CFIIS, hence battery charging will be assessed in accordance with BS 4142 to inform the need for any mitigation.

Noise from vehicle movements will (and currently does) contribute to the noise environment. There is the potential for noise levels to increase in some locations and decrease in others, as a result of the relocation of marshalling areas and accesses. There is the potential for positive impacts for some NSRs, particularly in Corran, where existing activity will move further away from some receptors.

No vibration effects are anticipated from operation of the development on either the Ardgour or Nether Lochaber side of the Narrows.

6.5 Mitigation

As it is not possible to assess blasting vibration at EIA stage, impacts from blasting (if required) will be controlled through the setting of vibration limits. These will be defined in consultation with the blast engineer and governed through construction Risk Assessments and Method Statements (RAMS). This mitigation has been captured in the ISoM in Section 24 for implementation.

6.6 Proposed Impact Assessment

It is proposed that the following elements are **scoped in** to the Noise Impact Assessment (see Table 6.6.1), and included within the EIAR:

- Construction noise (including road traffic but excluding blasting);
- Construction vibration (excluding blasting);
- Operational noise from temporary plant (e.g., diesel generator) and NEV batteries; and
- Operational noise from road traffic: the noise from road traffic arriving and leaving the ferry access areas (i.e. slipways and marshalling areas) will be considered.

Monitoring and methods proposed for the impact assessment is discussed in Section 6.6.1 and 6.6.2.

It is proposed that the following elements are **scoped out** of the Noise Impact Assessment as outlined in Table 6.6.1.

- Operational vibration: No vibration effects are anticipated from operation of the development;
- Blasting noise (air-overpressure): It is not possible to predict noise from blasts and BS 5228 advises that limits cannot be set. It is in the interests of the blast engineer to minimise air overpressure to increase the efficiency of the blast;
- Blasting vibration: It is not possible to assess this at the EIA stage and is more appropriately controlled through the setting of vibration limits. Should blasting be required, this will be controlled through use of a Risk Assessment Method Statement (RAMS).

A summary of the scoping outcomes is presented in Table 6.6.1.

6.6.1 Baseline Noise Monitoring

A baseline sound level survey will be undertaken as part of the EIA. It is proposed that monitoring will be undertaken at four Noise Monitoring Locations (NMLs). Indicative NMLs are shown on Drawing 99_DRG_08_1. If required, these will be adjusted in field to obtain the best representation of data for the NSRs. Continuous unattended monitoring will be conducted at NMLs for a period of approximately 1 week. In addition, some attended spot measurements will be undertaken during the installation and decommissioning of the survey equipment. Simultaneous wind speed and rainfall monitoring will be carried out at one of the NMLs and the measured sound level data filtered for periods of high wind speeds and precipitation events.

The monitoring undertaken at the NMLs will be used to quantify the existing background and ambient sound levels. These will then be used to determine appropriate noise level limits for the construction and operational periods. The spot measurements will be used to quantify noise levels from existing operations and sound sources, and will be used to inform the operational noise assessment.

6.6.2 In-air Noise and Vibration Impact Assessment

It is proposed that a Construction Noise Impact Assessment is undertaken in accordance with the BS 5228 guidance. Where appropriate, this assessment will also consider the potential for adverse vibration impacts, although this will not cover blasting, which can only be assessed following a series of test blasts on the development site.

An airborne noise propagation model will be produced that will predict noise levels for a series of construction scenarios, which will be determined with reference to a proposed construction timeline. Each modelled scenario will consider the noise level output of typical construction plant that may be working in activity areas closest to sensitive receptors. The predicted levels will be compared to the threshold levels detailed in BS 5228:2009+A1:2014 - Part 1 Noise.

Annex E of BS 5228:2009 provides methods of predicting vibration levels from a variety of construction activities. Vibration calculations will be undertaken for a similar set of scenarios as those selected for the airborne noise assessment. However, the study area for the vibration assessment will be limited to the closest receptors to the construction activity areas, on the assumption that if vibration is within acceptable levels at the closest receptors, then it should also be within acceptable levels at more distant receptors. Predicted vibration levels will be reported for both a 66% and 95% confidence level and compared to appropriate vibration limits. The assessment will consider vibration effects on both humans and buildings.

It is anticipated that operational noise of the temporary diesel generator, if required, and the permanent NEV charging infrastructure will be assessed in accordance with BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound.

In addition, consideration will also be given to traffic movements with due regard to appropriate standards, such as DMRB (National Highways *et al.*, 2024) to determine the Significance of Effects with respect to Observable Adverse Effects Levels.

As per the Pre-application Advice for Major Developments pack (THC, 2023a), the Noise Impact Assessment will include:

- For construction:
    - A description of construction activities with reference to noise generating plant and equipment;
    - A detailed plan showing the location of noise sources, NSRs and NMLs;
    - A description of any noise mitigation methods that will be employed and the predicted effect of such methods on noise levels;
    - A prediction of noise levels resultant at the curtilage of NSRs; and
    - An assessment of predicted noise levels in comparison with relevant standards.
- For operations:
    - A description of the proposed development in terms of noise sources and the proposed locations and operating times;
    - A detailed plan showing the location of noise sources, NSRs and NMLs;
    - A description of any noise mitigation methods that will be employed and the predicted effect of such methods on noise levels;
    - A survey of current ambient (LAeq) and background (LA90) noise levels at appropriate locations neighbouring the proposed site;
    - A prediction of noise levels resultant at neighbouring noise sensitive premises, for the operational phase of the proposed development. The raw data and equations used in the calculations will be made available on request; and
    - An assessment of predicted noise levels in comparison with relevant standards.

Table 6.6.1: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Noise (excluding blasting)	In	In
Vibration (excluding blasting)	In	Out
Road Traffic	In	In
Blasting Noise & Vibration	Out	NA

NA = Not applicable.

7 Underwater Noise

The focus of this section is to provide an understanding of underwater noise associated with the construction and operation of the proposed CFIIS. Underwater noise can cause disturbance or harm to fish and marine mammals depending on the frequencies and sound levels involved. The significance of the impacts of underwater noise on various ecological receptors can be found in Section 14.2: Marine Mammals and Section 14.3: Fish and Shellfish of this report. This section focusses solely on the sources of underwater noise and whether they can give rise to significant noise levels at frequencies that need to be considered for marine ecological receptors.

7.1 Policy, Guidance and Resources

The Scottish Government has released general policies as part of the Scotland's National Marine Plan in favour of sustainable development and use of the marine environment which include:

- **GEN 13 Noise**: Development and use of the marine environment should avoid significant adverse effects of man-made noise and vibration, especially on species sensitive to such effects (Scottish Government, 2015a).

The Scottish government has released a series of good environmental status descriptors (GES) within Scotland's National Marine Plan. These include:

- **GES 11**: Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment. (Scottish Government, 2015a).

General underwater noise data was explored from the Joint Nature Conservation Committee's (JNCC's) Marine Noise Registry (MNR) and noise related scientific literature to inform this section of the Scoping Report. This was determined to be suitable in the absence of underwater noise level data for the specific region of the Corran Narrows.

7.2 Baseline

Background or "ambient" underwater noise is created by several natural sources, such as rain, breaking waves, wind at the surface, and seismic, biological and thermal noise.

Biological sound sources include marine mammals (using sound to communicate, build up an image of their environment and detect prey and predators) as well as certain fish species. Anthropogenic sources of noise in the marine environment include fishing boats, ships,

industrial noise, seismic surveys and leisure activities, all of which add to ambient background noise.

Hydrodynamic and geophysical movement within the Narrows will contribute to the overall soundscape, known as geophony. Current speeds within tidal races can produce elevated background noise levels, particularly at higher velocities (Bassett *et al.*, 2014). Turbulence, seabed stress and sediment movement all contribute to elevated noise levels, typically at frequencies <100Hz (Willis *et al.*, 2013). It is expected that in the Corran Narrows, with observed tidal movements up to 2.85 ms^{-1} (Partrac, 2022), flow noise will contribute heavily to the overall soundscape. The Corran Narrows may have several anthropogenic noise sources that also contribute to the marine soundscape. The ferry service between Ardgour and Corran has been in place for centuries, with the current diesel-engine MV Corran operational since 2001. On a daily basis, the ferry transits the Narrows multiple times an hour and is likely to be a notable component of noise levels within the area. This also includes a programme of cruise vessels, with 17 cruise vessels scheduled for 2024 (FWMSCIC, 2024). As the only entrance into upper Loch Linnhe, the Corran Narrows is also a commonly used thoroughfare for other vessels and as such, will experience intermittent increases in vessel noise alongside typical ferry movements. Commercial vessels associated with the timber mill, aquaculture sites and other businesses at Corpach and Caol navigate the Narrows frequently, while recreational vessels transiting the Caledonian Canal must also navigate this area. Shipping generally contributes substantially to the noise levels at low frequencies (<1000Hz) in coastal areas (Wilcock *et al.*, 2014), however, the west coast of Scotland has lower overall shipping noise levels than other areas of the UK (Farcas *et al.*, 2020). Nonetheless, the baseline underwater noise levels are expected to be slightly elevated within the Corran Narrows due to vessel noise.

Other anthropogenic noise sources within the Corran Narrows and surrounding waters may be generated at the Ardgour salmon farm. While the farm does not use Acoustic Deterrent Devices (ADDs) to prevent seal depredation, typical activities at the site will likely create noise. These may include diesel-powered generators for electricity generation, air-powered feeder systems, net cleaning, and workboat/transportation vessel movements (Sim, 2021).

Seabed bathymetry can strongly influence the sound propagation (how sound travels from its source). Sound propagating in shallow waters, such as those in the Corran Narrows, interacts strongly with the seabed and surface. Reflection of the sound from these surfaces causes it to lose energy with distance from the source. Sound may also absorb into the seabed resulting in it being dampened, which is otherwise known as attenuation. Sound propagation within shallow water is complex and can be influenced by environmental factors including seasonal oceanographic conditions (DOSITS, 2021). The type of sediments in an area also influences sound propagation through reflection, attenuation, and scattering effects (Jensen *et al.*, 2011).

The bathymetry and hydrology of the Corran Narrows will heavily influence sound propagation, in addition to the enclosed nature of the Narrows and the surrounding coastline. The physical marine environment is largely influenced by tidal and eddy currents that move through the channel, which is approximately 280m wide at the narrowest point (Scottish Government, 2015b). Tidal fluctuations generate considerably strong currents (>2.5m/sec during spring tides). The main channel has a complex bathymetry which becomes a more gradual slope towards the Ardgour side. The maximum depth is approximately 29m below chart datum (CD). Due to the shallow depths associated with the area and the subsequent

absorption of sound at the seafloor and sea surface interface, it is likely that sounds do not travel far from the source within this environment (Richardson *et al.*, 1995).

7.3 Potential Construction Effects

During construction and installation of the CFIIS, there is the potential for underwater noise to be generated from the following activities:

- Rock stripping and possible rock blasting;
- Vibration and impact piling;
- Dredging activities; and
- Vessel movement.

Reclamation of land includes the placement of material onto the seabed, however noise levels associated with this activity are minimal and hence not considered within this section.

7.3.1 Rock Stripping

Rock stripping may need to be conducted to create suitable depths or surfaces for installation of infrastructure. This may be conducted using mechanical methods or blasting, which may produce elevated noise levels.

The mechanical rock breaking technique employed will determine the source noise levels, for example measurements of hydraulic rock breaking of a Xcentric Ripper determined unweighted source levels of 184.8 decibels (dB) re 1 Mirco-pascal (µPa) RMS (Lawrence, 2016). As discussed in Section 14.2 and 14.3 the potential for disturbance of ecological receptors by rock stripping activities cannot be ruled out at this stage.

If underwater rock blasting techniques are required for the construction phase of CFIIS, noise emissions would have a greater likelihood of causing adverse effects on receptors and could potentially cause significant effects.

7.3.2 Piling

Piling will be required to construct the overnight berthing structure and Ardgour slipway structure. Underwater noise levels generated by piling increase with pile diameter. This is due to larger diameter piles having greater surface areas in contact with the surrounding environment. As such, more energy can be transferred into the water column and seabed in the form of noise. Noise from piling is produced as piles are driven into the seabed using vibration or hammer (impact) methods. Pilling typically gives rise to noise at levels at source which are high enough to cause harm to marine mammals and potentially fish, hence, this will need to be further considered.

7.3.3 Dredging

Dredging will be required during the CFIIS construction to achieve the depths required for the infrastructure and ferries. Dredged material may be disposed of at appropriate sites or used within other areas of the construction. Dredging may utilise a dredging vessel with a backhoe excavator (i.e., backhoe dredging (BHD), but other techniques (plough or hydraulic dredge) may also be needed depending on the bathymetry, sediment composition and infrastructure design.

Source noise levels associated with dredging activities are routinely below that which would be expected to physically impact ecological receptors. As noise emitted would rapidly dissipate

within the shallow water environment at the Corran Narrows, it is not anticipated that this noise source would be considered significant in EIA terms.

7.3.4 Vessel Movement

Vessel movement associated with the aforementioned activities may be the most frequently occurring noise source at the proposed CFIIS. Vessel traffic is a substantial contributor to general anthropogenic underwater noise, with the primary sources of sound coming from the propellers, propulsion and other machinery (Ross, 1976; Wales and Heitmeyer, 2002). During construction there will be increased vessel activity as materials are transported to the site and used to place structures in their relevant locations.

There are no studies to quantify the levels of shipping related noise within the proposed CFIIS location. Studies to examine the impact of ship noise on cetaceans often cite 120 dB re 1 µPa as a disturbance threshold (Hatch *et al.*, 2012; McQuinn *et al.*, 2011), and it is recognised that noise produced by shipping can cause stress impacts in marine mammal, fish and invertebrate populations (Rolland *et al.*, 2012; Wale *et al.*, 2013). The extent of vessel noise on the Scottish west coast has yet to be thoroughly investigated, however, marine traffic frequently occurred in data recorded from various locations around the UK coast (Merchant *et al.*, 2016).

In the Corran Narrows, vessel movements during the construction phase may be more frequent than during normal time periods that would involve typical transit of vessels through the channel, fish farm vessel movements and current ferry journeys. However, overall noise levels are not expected to be significantly elevated as construction operations will be undertaken at very slow vessel transit speeds due to the nature of the vessels and activities undertaken.

7.4 Potential Operational Effects

Activities associated with the operational phase that have the potential to generate underwater noise include:

- Vessel movement; and
- Maintenance dredge activities.

7.4.1 Vessel Movement

Although ferry operations are outwith the scope of the CFIIS, it is recognised the CFIIS will facilitate the introduction of an NEV and slightly alter the route of the ferry crossing. Hence vessel movement has been included for completeness.

Noise associated with the normal operation of the NEV associated with the CFIIS may have an impact on the underwater soundscape, electric ferries are considered to produce less noise than conventional diesel-powered ferries. In a shallow-water river system, an electric ferry was found to produce noise between 400 and >11 000 Hz (based on the 75th percentile above 120 dB re 1µPa2 m2). Under the same conditions, a diesel-powered ferry generated noise between 20 to >11 000 Hz, and at radiated noise levels 8-12 dB greater than the electric vessel (Parsons *et al.*, 2020).

Whilst the NEV is expected to result in lower underwater noise levels than the existing diesel ferries reducing the overall sound scape, it is acknowledged that the diesel-operated MV Corran will still be in use occasionally as the back-up vessel.

7.4.2 Dredging

Maintenance dredging may be required infrequently at the overnight berthing structure and/or slipways during the operational phase to maintain water depths for vessels. Underwater noise associated with dredging in the Corran Narrows is not anticipated to result in significant effects as described in Section 7.3.3.

7.5 Proposed Impact Assessment

It is proposed that potential sources of underwater noise from the construction phase arising from rock stripping, underwater rock blasting (if required) and piling are **scoped in** to the EIA process (see Table 7.4.1). Dredging and vessel movements will be **scoped out** as they are unlikely to give rise to harmful noise levels. A slight reduction in underwater noise is expected during the operational phase due to the introduction of the NEV, however it is unlikely to be significant and hence it is proposed that operational underwater noise effects are **scoped out** of the EIA.

Rock stripping, blasting and piling will be modelled to predict the noise emission levels and frequencies at difference distance from noise sources. The underwater noise model will inform the marine ecology impact assessments. As the project design develops, effort will be made to minimise underwater noise sources and their sound pressure levels.

Table 7.5.1: Summary of Effects Scoping Table

Potential Impact	Phase	
	Construction	Operations
Rock Stripping and Potentially Blasting	In	NA
Piling	In	NA
Dredging	Out	Out
Vessel Movement	Out	Out

NA = Not applicable.

8 Air Quality

This section focusses on fugitive dust emissions as a potential air quality impact associated with the CFIIS. GHG emissions associated with the project during construction and operations are covered in Section 22: Climate Change. No other planned discharges to air that could have an impact on air quality have been identified.

8.1 Legislation, Policy, Guidance and Resources

The Air Quality Standards (Scotland) Regulations 2010 lay out limits and targets for air quality including limits for particulate matter.

The Scottish Government has released general policies as part of the Scotland's National Marine Plan in favour of sustainable development and use of the marine environment which include:

- **GEN 14 Air quality**: Development and use of the marine environment should not result in the deterioration of air quality and should not breach any statutory air quality limits (Scottish Government, 2015a).

Policy 23(d) of the NFP4 provides for the protection of air quality for new development proposals (Scottish Government, 2023).

Relevant guidance relating to air quality includes:

- IAQM Guidance on the assessment of dust from demolition and construction (IAQM, 2024);
- IAQM Air Quality Monitoring in the Vicinity of Demolition and Construction Sites (IAQM, 2018);
- Guidance for Pollution Prevention (GPP) 6: Working at construction and demolition sites (Environment Agency, Northern Ireland Environment Agency (NIEA), Department for Environment, Food and Rural Affairs (DEFRA), SEPA and Natural Resources Wales (NRW), 2023); and
- Pre-application Advice for Major Developments pack (THC, 2023a).

Relevant sources of information include:

- 2023 Air Quality Annual Progress Report for The Highland Council (THC, 2023b) and
- Air Quality in Scotland Air Quality Management Areas (AQMA) (Air Quality in Scotland, 2024).

8.2 Baseline

The Highlands are a primarily rural area, with a low population density. Air quality in the Highland Council area is generally good (THC, 2023b). Background dust emissions at Ardgour and Corran are not expected (or known) to be high as there are limited potential sources of dust in the area.

8.2.1 Air Quality Management Areas

The Air Quality in Scotland website provides a centralised source of air quality information for Scotland. Data and maps on Local Air Quality Management parameters and AQMA are provided (Air Quality in Scotland, 2024).

The area of proposed development (i.e. Corran Narrows; Ardgour and Nether Lochaber sides) is not designated as an AQMA, and the nearest designated area is the city centre of Inverness. Inverness is approximately 73 miles north-east of Corran; therefore, this AQMA will not be affected by the CFIIS.

8.2.2 Potential Dust Receptors

As per the guidance (IAQM, 2024), human dust sensitive receptors were identified within 350m of the site boundary. At Ardgour, receptors include private residences as well as two commercial properties, the Inn at Ardgour and the Nomad Café. The closest of these are situated along the A861, directly across the road from the proposed civil works.

At Corran, human dust sensitive receptors include private residences of the village, the nearest of which is North Corran Beag Home (~15m from site boundary and of which the garden is adjacent), as well as commercial businesses, The Corran Bunkhouse and The Corran serviced accommodation (~200m from the main development boundary north of the village and ~43m from the proposed new footpath). Additionally, residences within 350m of the proposed construction compound south of Corran include houses either side of the Bunree Junction and at Inchree.

Dust sensitive receptors within 50m of the construction traffic route (i.e. A861 and A82) within 250m of site entrances (including construction compound entrances) were identified in line with the guidance (IAQM, 2024). Additional receptors identified from this process include one residential house out with the main village of Ardgour, at grid reference NN 01438 63451, and 5 properties along the A82, south of the proposed construction compound.

In this instance it is deemed prudent to also consider the A82 trunk road as a receptor. The A82 currently has a 50 mile per hour (mph) speed limit in the vicinity of the CFIIS, as such there is a potential for high volumes of relatively fast moving traffic to be on the road, which could be impacted by trackout.

Vegetation and fauna may also be disturbed by prolonged exposure to high concentrations of dust, however, no sensitive ecological receptors as defined within the IAQM (2024) guidance are identified.

8.3 Potential Construction Impacts

Dust has the potential to affect human health through inhalation of particles and dust particles in eyes. Dust can also cause a nuisance by coating surfaces such as cars and windows. Dust deposition on vegetation may reduce a plant's ability to photosynthesise and carry out other biological functions such as gas exchange, which stresses plants, and if allowed to continue for lengthy periods of time could cause adverse effects.

The IAQM (2024) guidance splits construction dust sources into four types, a brief description of these is provided below:

- Demolition - the removal of existing structures. Dust arisings depend on the construction materials and how the structures are demolished. For example, the use of a wrecking ball on a brick building will give rise to high levels of airborne particulate dust;
- Earthworks - the process of soil-stripping, ground levelling, excavation and landscaping. This process gives rise to exposed soils both in-situ and when stored. If the soils are allowed to dry out, they become a source of dust when soil particulates are made airborne by being moved, disturbed by plant movements or blown by the wind;
- Construction - the provision of new structures, modification or refurbishment of structures. Construction sources of dust relate to the specific construction materials and techniques, but are primarily associated with dry construction materials. Examples include the storage, movement and placement of aggregates, the working of materials (i.e., cutting blocks and slabs) and the use of cements, especially if allowed to dry out; and
- Trackout – the movement of materials onto public roads by traffic. Soils and construction materials can be spread, wet or dry, from the site onto public roads via construction vehicle tyres, directly impacting upon road conditions and, when allowed to dry out, providing a source of dust made airborne by the wind or when driven over.

The potential for each type of dust source to arise due to the CFIIS construction works are discussed in turn in the following sections.

8.3.1 Demolition

With regard to the CFIIS, there is a need to demolish the existing small pier at Ardgour. The pier is low lying and primarily made of steel and concrete. The means of demolition (steel cutting and concrete breaking) are unlikely to give rise to noticeable quantities of dust for this relatively small structure.

8.3.2 Earthworks

Approximately 2.1 ha of earthworks including excavations, infill and levelling may be required for works on the Nether Lochaber side of the Narrows, with an additional 0.2 ha and 1.2 ha allowances for construction of the shared use path and construction compound respectively. Onshore rock stripping or rock blasting may be required, potentially giving rise to acute, but localised and temporary dust emissions. The scale of the works at Corran and the fact that the shared use path passes close to residential properties mean that there is a potential for significant effects in the absence of appropriate mitigation measures.

Up to 0.2 ha of earthworks is estimated to be required for the Ardgour shoreside works with up to a further 1.1 ha for the construction compound. The earthworks area is much smaller in Ardgour, than on the Nether Lochaber side. Although Ardgour earthworks are in the immediate vicinity of residential properties, it is unlikely to give rise to significant dust effects due to their small nature. However, that does not mean that mitigation shouldn't be applied to minimise nuisance effects.

8.3.3 Construction

Construction works (i.e., provision of new structures, modification or refurbishment of structures) associated with the CFIIS that are not being completed in the marine environment are primarily associated with surfacing of the earthworks areas and the construction of the buildings. The toilet block at Corran is a relatively small building and located away from residential receptors, and the pursers kiosks are likely to be prefabricated. Hence, construction works associated with the CFIIS are unlikely to give rise to significant dust sources.

8.3.4 Trackout

CFIIS development includes the creation of a new junction onto the A82 trunk road. Once the junction is created, it will be utilised as the access for all construction works on the Nether Lochaber side. While the new junction being created, the construction compound will be located south of Corran, with access from the junction of the A82 and a local road to Bunree. Construction traffic will have to travel up and down the A82 between this compound and the development site north of Corran for the initial works. Once the new junction with the A82 is complete and the construction compound is relocated to within the Scoping boundary north of Corran, there will still be a need for vehicular access to and from the A82 trunk road by the construction workers and delivery vehicles.

As discussed in Section 8.3.2, there is a large area of earthworks required for CFIIS works on the Nether Lochaber side, providing a source of trackout material. The A82 has been identified as a receptor (see Section 8.2.2) in this instance. Track out onto this trunk road could affect the road surface in terms of traction, and dust in the air could affect visibility, both of which could impact upon road safety.

Trackout effects on the Ardgour side will be limited due to the smaller volume of traffic, and limited area of earthworks.

8.4 Potential Operational Impacts

All work areas and new infrastructure will be finished with hard surfacing, dense aggregate, rock armour or replanted with vegetation, hence, there will be no ground left exposed to give rise to sources of dust. Hence, the operational phase of the CFIIS is not expected to cause any effects to baseline air quality with regard to dust.

8.5 Mitigation

Significant effects from dust in Ardgour are not predicted, however, mitigation will still need to be implemented, due to the close proximity of residential properties, to ensure that no nuisance effects are experienced. Without sufficient mitigation, significant dust effects are predicted for receptors on the Nether Lochaber side, and hence project specific mitigation measures need to be developed. It is proposed that for consistency and completeness, dust mitigation for Ardgour is not proposed at this stage, instead it will be developed during the EIA process.

8.6 Proposed Impact Assessment

It is proposed that air quality in terms of dust is **scoped in** for construction, due to the need to complete a full assessment of earthworks and trackout effects for the CFIIS to allow site specific mitigation to be identified. Air quality effects associated with operations are **scoped out**. See Table 8.6.1 for a summary of the scoping of effects.

The impact assessment will follow the guidance set out in 'Guidance on the Assessment of Dust from Demolition and Construction' (IAQM, 2024), and will consider earthworks and trackout effects on the dust receptors identified in Section 8.2.2.

Mitigation will be proposed, including monitoring, in line with Air Quality Monitoring in the Vicinity of Demolition and Construction Sites (IAQM, 2018) for activities on both the Nether Lochaber and Ardgour sides of the Narrows.

It should be recognised that dust mitigation is well understood and very effective. Hence, with mitigation and monitoring in place, no residual effects on air quality are predicted.

Table 8.6.1: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Demolition dust effects on human receptors, namely Ardgour residents	Out	NA
Earthworks dust effects on human receptors	In	NA
Construction effects on human receptors	Out	NA
Trackout on human receptors and the A82	In	NA
Dust effects on ecological receptors	Out	NA

NA = Not applicable.

9 Geology, Land and Soils

The focus of this section is geology, land and soils onshore. The potential effects on sediments in the marine environment will be addressed in Section 11: Seabed, Coastal Processes and Flooding. Furthermore, it is acknowledged soils are integrally connected to the habitats they support. Impacts on terrestrial habitats are discussed in Section 13: Terrestrial Ecology and Ornithology.

9.1 Policy, Guidance and Resources

In relation to soils, NPF4 sets out under Policy 5 the intent to '*protect carbon-rich soils, restore peatlands and minimise disturbance to soils from development.*' Specifically:

a) Development proposals will only be supported if they are designed and constructed:

i. In accordance with the mitigation hierarchy by first avoiding and then minimising the amount of disturbance to soils on undeveloped land; and

ii. In a manner that protects soil from damage including from compaction and erosion, and that minimises soil sealing.

b) Development proposals on prime agricultural land, or land of lesser quality that is culturally or locally important for primary use, as identified by the LDP, will only be supported where it is for:

i. Essential infrastructure and there is a specific locational need and no other suitable site;

ii. Small-scale development directly linked to a rural business, farm or croft or for essential workers for the rural business to be able to live onsite (Scottish Government, 2023);

The following guidance and resources have been used to inform this section:

- IEMA Guide: A New Perspective on Land and Soil in Environmental Impact Assessment (IEMA, 2022a);
- GPP 2: Above Ground Oil Storage (NIEA, DEFRA, SEPA and NRW, 2018a);
- GPP 6: Working at Construction and Demolition Sites (NIEA, DEFRA, SEPA and NRW, 2023);
- GPP 22: Dealing with Spills (NIEA, DEFRA, SEPA and NRW, 2018b); and
- Ground Investigation Interpretative Report (Causeway Geotech, 2024).

9.2 Baseline

The baseline presented in this section has been informed by ground probing, geotechnical investigations, desktop studies and site walk-overs. The ground probing consisted of 40 hand probes completed on the Nether Lochaber side to determine the depth to suitable engineering soil/rockhead. It was not possible to deploy other ground investigation techniques at the Nether Lochaber side, as a result of a lack of access afforded by the current topography and tree coverage in the area.

Five trial pits were dug on the Ardgour Side, two close to the existing marshalling areas (TP02 and TP03) and three in the field adjacent to the existing substation (TP05-TP07 as shown on Figure 9.2.1). Samples from each of the trial pits were subject to chemical analysis in the form of waste acceptance criteria testing. Various compounds and elements were quantified in the soil samples with their associated leachates (Causeway Geotech, 2024).

Figure 9.2.1: Trial Pit (TP) Locations (Causeway Geotech, 2024)

9.2.1 Designated Sites

Three designated sites relevant to geological features were identified within 5 kilometres (km) of the scoping boundary. These are outlined in Table 9.2.1.

Geological Conservation Review (GCR) sites contain geological and geomorphological features of national and international importance. Most GCR in Scotland have statutory protection through designation as geological features in Sites of Special Scientific Interest (SSSIs) (NatureScot, 2023a).

Table 9.2.1: Sites of Geological Significance within 5km of the CFIIS Scoping Boundary

Designated Site	Approximate Distance and Direction from CFIIS Site	Qualifying Features	Potential for Connectivity Yes/No	Evaluation Rationale
Onich to North Ballachulish Woods and Shore SSSI	300m SE	Geological Dalradian Supergroup	No	Not considered further – Distances between the designated site and the CFIIS are considered too great for impacts to geological features.
Onich Dry River Gorge GCR Site	700m SE	Geology	No	**Not considered further** – Encompassed within the Onich to North Ballachulish Woods and Shore SSSI, hence distance is considered too great for effects to geological features.

Onich Shore Section	1.8km SE	Geology	No	**Not considered further** – Encompassed within the Onich to North Ballachulish Woods and Shore SSSI, hence distance is considered too great for effects to geological features.

As outlined in Table 9.2.1, designated sites in proximity to the CFIIS are all determined to be too far away for impacts to the designated geological feature(s), hence designated sites are not considered further within this section.

9.2.2 Geology

The bedrock geology around Corran is dominated by metamorphic rocks of the Dalradian Supergroup. These rocks are metamorphosed sediments of Precambrian age (>542 million years old). On the Nether Lochaber side, the Linnhe Quartzite member is interrupted by three igneous intrusions of Siluro-devonian age (443-354 million years old). On the Ardgour side is the Fort William formation Micaceous psammite and semipelite.

Another significant feature of the wider regional geology is the Great Glen fault which forms a series of NE-SW trending faults which generally follow the line of Loch Linnhe. However, in this specific location, both sides of the loch form part of the Dalradian supergroup which lies to the SE of the main fault line (Causeway Geotech, 2024).

9.2.3 Soils

The generalised soil type at Ardgour is mineral podzols, and mineral podzols or peaty gleys for the site north of Corran (see Figure 9.2.2). Underlying the topsoil, superficial deposits are mainly marine or raised marine in nature. These are well drained. Therefore, it is unlikely that any peat will be present in the site. This is supported by the findings of trial pits dug as part of ground investigation works in the field at Ardgour, which encountered topsoil in the 50-150mm stratum (Causeway Geotech, 2024). Ground probing at the CFIIS site north of Corran returned a maximum depth to underlying engineering soil / rockhead of 0.7m, with an average depth of 0.25m. Some probe locations were recorded as being exposed rockhead with no overlying cover. It was noted that the material covering the rockhead was loose, providing little to no resistance.

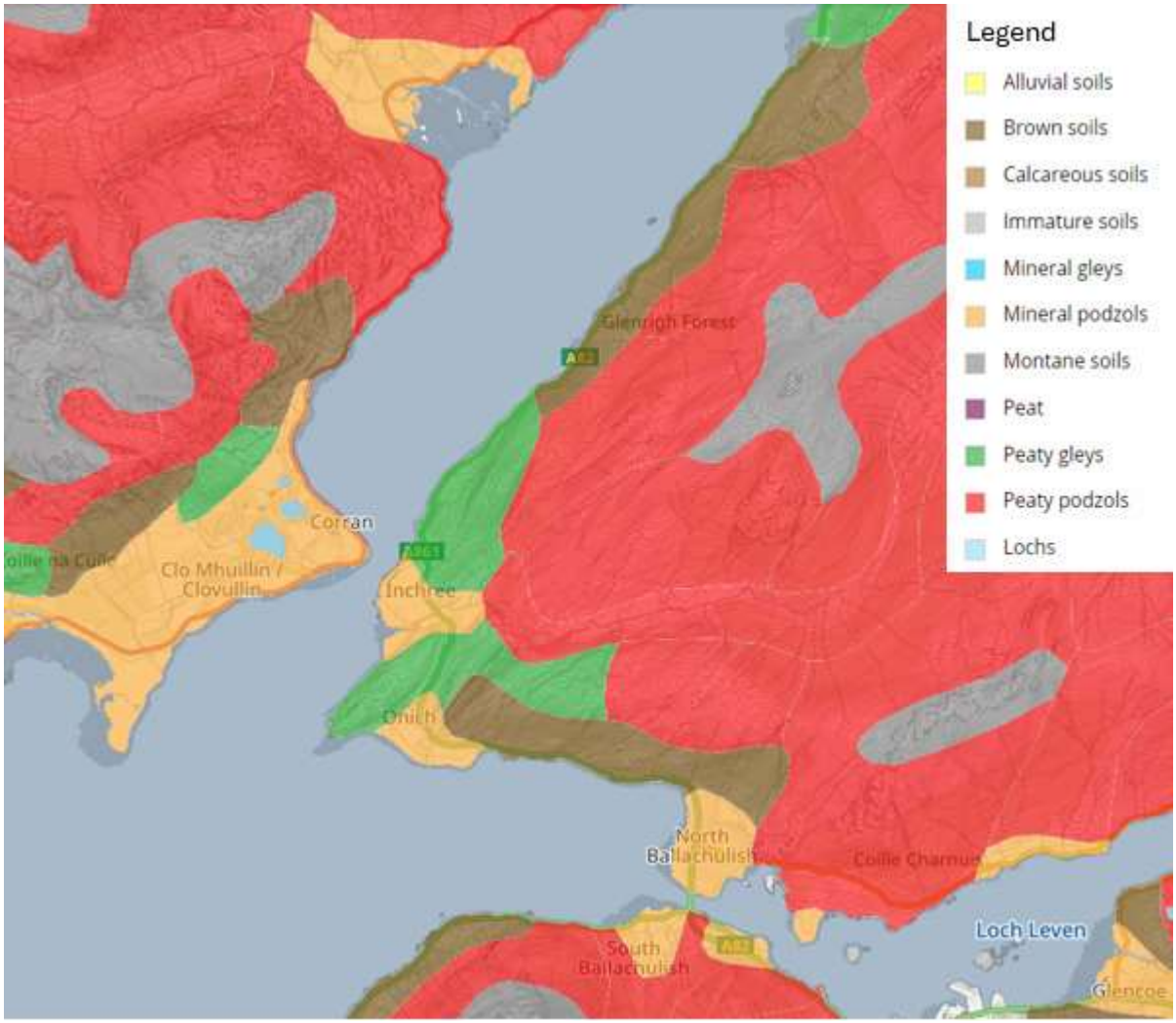

Figure 9.2.2: Soil Types at the CFIIS Site and Surrounds (Scotland's Soils, 2024)

Land Capability for Agriculture (LCA) classification, rates land on scale of 1 to 7 with Class 1 representing land that has the highest potential flexibility of use and Class 7 as land of very limited agricultural value. The LCA within the CFIIS scoping boundary on both sides of the Narrows is 5.3: 'Land capable of use as improved grassland. Pasture deteriorates quickly' (Scotland's Soils, 2024), see Figure 9.2.3. This is average for the wider region, whereby the quality of land for agriculture is generally classified as either land capable of use as improved grassland, land capable of producing a narrow range or crops, or land capable of use as rough grazings.

Figure 9.2.3: LCA at the CFIIS Site and Surrounds (Scotland's Soils, 2024)

9.2.4 Contamination

Neither side of the Corran Narrows have a history of industrialisation, that would suggest a likelihood of significant sources of pollutants that could have caused land contamination. The use of hydrocarbons in the form of heating oil, fuels and lubricants of vehicles, could give rise to small scale sources of contamination, but no evidence of this has been found.

The samples taken from the trial pits during the ground investigations did not identify any evidence of ground contamination, when compared against the waste acceptance criteria all samples were identified as inert waste.

Japanese knotweed has been identified on the Nether Lochaber side (see Section 13.1.3). Japanese knotweed are a perennial plant, growing each year from extensive underground rhizomes. The species can be spread when fragments of rhizome, or stem (as small as 1cm or less) are transported to new sites, which can then develop into new plants. The soils under and adjacent to stands of Japanese knotweed could contain the plants rhizomes (generally at distances of ≤7m and to 2m in depth). Hence, all soils to rockhead within 7m of the above-ground areas of Japanese knotweed are considered to be contaminated with INNS (SEPA, 2008).

9.3 Potential Construction Impacts

Construction impacts on geology, land and soils associated with the CFIIS include:

- The removal (i.e., loss) of rock and soils through excavations;
- The risk of spread of existing contamination;
- Soil degradation; and
- Soil contamination.

9.3.1 Loss of Geology and Soils

On the Ardgour side, removal of soils will be minimal, limited to activities such as the installation of services including electrical infrastructure adjacent to the existing substation, to facilitate the NEV charging system.

On the Nether Lochaber side, soil stripping will be more extensive, approximately 2.1 ha. The depth to engineered soil/rockhead is low (average of 0.25m), hence a total of 5,250 Metres-cubed (m^3) of soil will be removed to make way for the road junction, marshalling area, parking, footpaths etc. The intent is to reuse the soils in the reprofiling of the surrounding areas where practicable, however, the detail of this has not yet been developed. As discussed in Section 9.2.3, the LCA grade of the soil is 5.3 which is of relatively low agricultural value and widespread in the area. As such the removal of the soil is not likely to have a significant effect on agriculture, or soil assets of the area.

Rock stripping and rock blasting may also be required (though blasting is less likely). Rock stripping/blasting for the CFIIS is not of a scale as to have a significant effect on the characteristics of the regional geology. Although a cut and fill calculation has not yet been completed (refer Section 15: Materials and Waste for further details), it is likely that all of the rock removed will be reused in the land reclamation elements of the scheme and will not be required to be removed from site.

9.3.2 Spread of Existing Contamination

As discussed in Section 9.2.4 it is known that an area of soil on the Nether Lochaber side is subject to Japanese Knotweed contamination, this soil will need to be appropriately managed to prevent the spread of this INNS. As discussed in Section 12.1.1.3 under the Wildlife and Countryside Act 1981 it is a legal offence to knowingly or recklessly allow INNS to spread into the wild. As such appropriate management of both the plant and soils is required. Japanese Knotweed is considered further in Terrestrial Ecology (Section 13). An eradication plan is being developed in alignment with SEPA (2008) guidance, which will include the management of contaminated soils (Section 13.3).

No other contaminated land has been identified on site, and the risk of finding any is thought to be low. If, however, potential contamination is encountered during the construction works, then affected soils will be isolated, while they are further investigated, and their fate considered.

9.3.3 Degradation of Soils

Exposed soils may dry out and be eroded by wind and water. Where material is being excavated within the Nether Lochaber side construction footprint and being reused onsite, soil will be placed in its final location directly where possible and planted promptly to protect it against the degrading forces of wind and water. Where this is not the possible it will be appropriately stored to minimise further degradation. Storage of materials including soils is considered in Section 15.

Construction compound creation will require the removal of soil to allow appropriate hard standings to be installed. Once no longer needed the areas will be reinstated, by removing any aggregate placed to create the hard standing and restoring the soils. As discussed in Section 15, any soils stored will have to be stored appropriately. This may include the use of turves or planting in areas where soils are stored for a long period of time, to protect them from degradation.

9.3.4 Soil Contamination

Pollution from a loss of containment of hazardous materials or waste on the construction site, could give rise to soil contamination. The risk of loss of containment is reduced by ensuring appropriate storage and handling of materials as explained in Section 15.

As per standard construction site practices, if a loss of containment were to occur onsite, Pollution Incident Response Plans would be employed in alignment with the pollution control hierarchy. This will include the deployment of materials available in onsite spill kits to minimise the spread and to absorb polluting substances. Where spills soak into the ground/soils it, is standard procedure to dig up the soils and sentence them as waste for offsite appropriate disposal.

9.4 Potential Operational Impacts

The CFIIS includes components of land reclamation and hence, once completed, additional land will have been created. This will provide the space required for shoreside operations of the Corran Ferry service, such as marshalling. By creating land for this use, there is less land-take of existing land. As the land reclamation is part of the design and is required to allow the facilities to be accommodated within the existing setting (topography of the area and existing

land uses), it is not considered an impact on a receptor and therefore will not be taken forward for further consideration in the EIA.

9.5 Mitigation

Cut and fill calculations will be completed as part of the design process with the aim being to maximise the onsite reuse of materials in an appropriate manner. This includes consideration of the reuse of soils, rocks and dredge spoil, where possible.

Mitigation identified in Section 13.5 with regard to developing a Japanese Knotweed eradication plan and implementing it at the earliest opportunity will ensure that there is no spread of Japanese Knotweed contaminated soils.

If previously unidentified contaminated land is suspected or found on site, works in the immediate vicinity will be halted and advice sought from the Environmental Clerk of Works (ECoW) in the first instance. If the soils have already been excavated, they will be isolated from other materials while advice is sought.

Mitigation identified in Section 15.5 with regard to the appropriate storage and handling of material, will help to minimise soil degradation. Soil removed from temporary areas will be stored to allow it to be used as part of the site reinstatement.

A Pollution Incident Response Plan will be developed in alignment with GPP 22 (NIEA, DEFRA, SEPA and NRW, 2018b) to protect land and water in the event of a loss of containment of potentially polluting substances (refer Section 10.3). Spill kits will be made available close to the working areas with equipment suitable for the types and quantities of materials being utilised.

9.6 Proposed Impact Assessment

Potential effects on geology, land and soils as a result of the CFIIS taking account of mitigation identified in Section 9.5, 13.3 and 15.5 will not be significant. Therefore, it is proposed this topic is **scoped out** of the EIA for both the construction and operations phase.

Table 9.6.1: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Loss of geology and soils.	Out	NA
Spread of Existing Contamination	Out	NA
Degradation of soils.	Out	NA
Soil Contamination	Out	NA

NA = Not applicable.

10 Water Quality

This section will address water quality by considering the water column of the marine environment, the groundwater and terrestrial waterbodies as potential receptors.

10.1 Legislation, Policy, Guidance and Resources

Relevant legislation for water quality include:

- The Water Framework Directive (WFD) (Directive 2000/60/EC of the European Parliament) (see Section 4.1.7 for further details);
- Water Environment and Water Services (Scotland) Act 2003 as amended;
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011 as amended ('CAR');
- Bathing Water Directive (2006/7/EC); and
- The Water Environment (Shellfish Water Protected Areas: Environmental Objectives etc.) (Scotland) Regulations 2013, as amended.

General policies as part of the NMP relevant to water quality include:

- **GEN 12 Water Quality and Resource**: Developments and activities should not result in a deterioration of the quality of waters to which the Water Framework Directive, Marine Strategy Framework Directive or other related Directives apply (Scottish Government, 2015a).

The Scottish government has also released a series of good environmental status (GES) descriptors within Scotland's NMP. These include:

- **GES 5**: Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algal blooms and oxygen deficiency in bottom waters; and
  GES 8: Concentrations of contaminants are at a levels not giving rise to pollution effects (Scottish Government, 2015a).

Management of the water environment is considered in the HwLDP (THC, 2012) under the following policies:

- **Policy 49**: Coastal Development, which states:
  - *Proposals should not have an unacceptable impact on the natural, built or cultural heritage and amenity value of the area*; and
- **Policy 72**: Pollution, which states:
  - *Proposals that may result in significant pollution such as noise (including aircraft noise), air, water and light will only be approved where a detailed assessment report on the levels, character and transmission and receiving environment of the potential pollution is provided by the applicant to show how the pollution can be appropriately avoided and if necessary mitigated.*
  - *Major Developments and developments that are subject of Environmental Impact Assessment will be expected to follow a robust project environmental management process, ….or a similar approach.*

Relevant guidance utilised in this section includes:

- Planning Advice Note (PAN) 79: Water and Drainage (Scottish Government, 2006);
- GPP 2: Above Ground Oil Storage Tanks (NIEA, DEFRA, SEPA and NRW, 2018a); and
- GPP 5: Works and Maintenance in or Near Water (NIEA, DEFRA, SEPA and NRW, 2018c);
- GPP 6: Working at Construction and Demolition Sites (NIEA, DEFRA, SEPA and NRW, 2023);
- GPP 22: Dealing with Spills (NIEA, DEFRA, SEPA and NRW, 2018b); and
- Guidance - Water Framework Directive Assessment: Estuarine and Coastal Waters (Environment Agency, 2023).

10.2 Baseline

Water quality monitoring results were requested and obtained from MOWI for their 'Linnhe' fish farm north of the CFIIS (refer Sections 10.2.6 and 10.2.9 for further details). Note, potential socioeconomic impacts on this fish farm are considered in Section 20: Population and Socioeconomics.

10.2.1 Loch Linnhe Waterbody Status

Loch Linnhe is one of the largest sea lochs on Scotland's west coast, stretching ~60 km in a south-west to north-east direction (Scottish Government, 2015b). The loch forms part of the Caledonian canal linkage between the Irish and North Seas. Loch Linnhe branches into Loch Eil, the Caledonian Canal and the River Lochy ~14km north-east of the narrows, near Fort William. Loch Linnhe forks ~36km south-west of the narrows at the Isle of Mull into the Sound of Mull and Firth of Lorn, which both lead to the Hebridean sea in the west (see Figure 10.2.1).

Loch Linnhe has a fjordic nature, in which interactions between seabed topography, freshwater input, tide level variations and meteorological forces (e.g., wind) drive the circulation. Freshwater inflows are a key control of the Loch Linnhe system dynamics, determining surface stratification and controlling deep water renewal (i.e., the entry of more saline and dense seawater from the south-west). Pulsed releases of freshwater from upper Loch Linnhe travel through the Corran Narrows, then along the northern side of the lower loch (due to rotation), and finally out to sea (Scottish Government, 2015b).

Loch Linnhe is designated into two water bodies for the purpose of SEPA water quality characterisation. These water bodies are divided at the Corran Narrows along the approximate line of the existing ferry route (Figure 10.2.1). Loch Linnhe North (SEPA ref: 200089) is a transitional water body, 25.3 Kilometres-squared (km^2) in area. Loch Linnhe South (SEPA ref: 200081) is a coastal water body 148.7km^2 in area. The most recent assessment, undertaken in 2014, found Loch Linnhe North was classified as having 'good' overall and water quality status, and 'high' physical condition status. Loch Linnhe South was classified with slightly lower results, having 'moderate' overall and water quality status and 'high' physical condition status (SEPA, 2015).

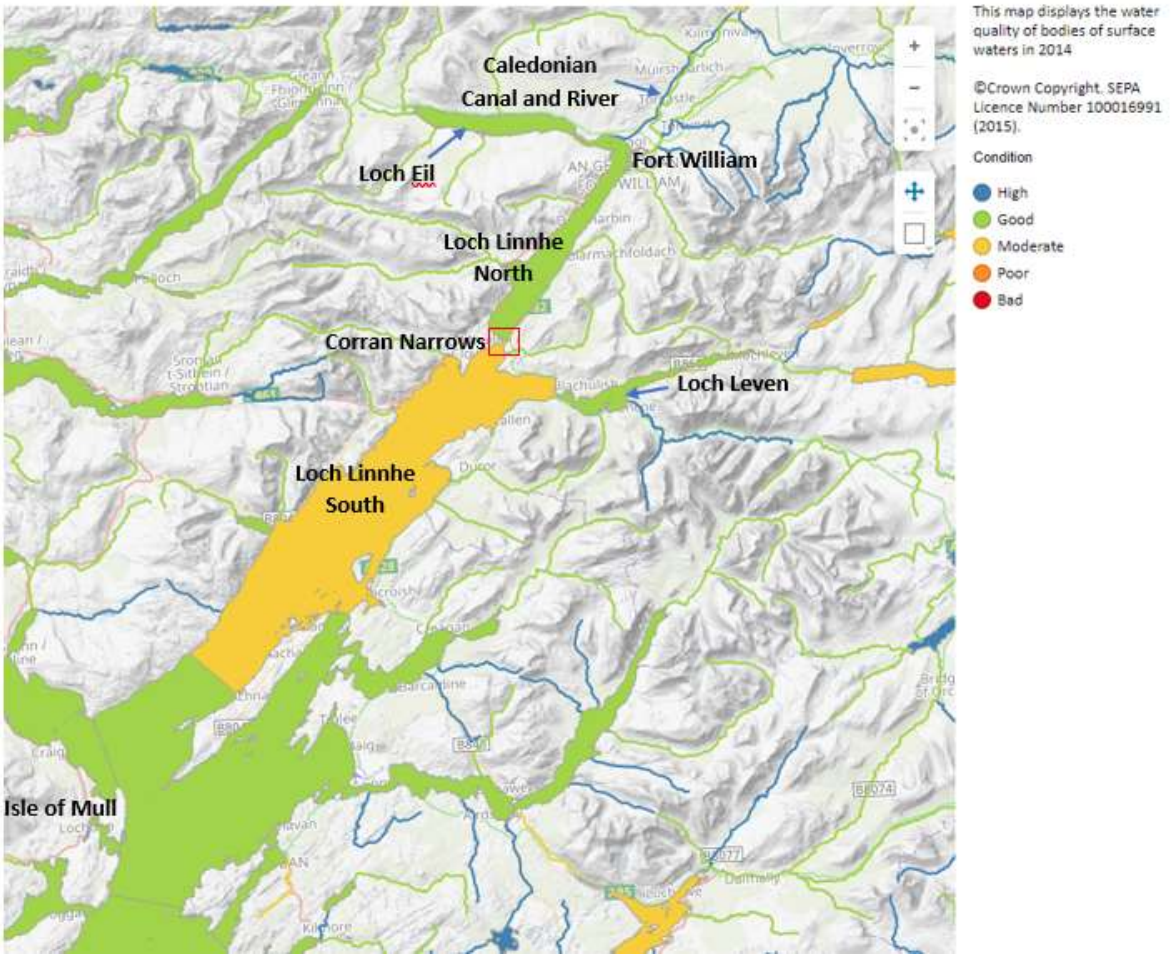

Figure 10.2.1: 2014 Water Quality Status of Loch Linnhe (SEPA, 2015)

10.2.2 Groundwater

Groundwater in the area is associated with the Fort William groundwater body in the Scotland river basin district (SEPA ref: 150696) which covers a total of 2274.7km^2. This groundwater body is classified as good overall status and is a drinking water protected area (SEPA, 2023a; SEPA, 2023b). As discussed in Section 9.2, rockhead or sound engineering soil was found at a maximum depth of 0.7m on the Nether Lochaber side during a probing study.

10.2.3 Watercourse

There is a small, freshwater watercourse in Corran that crosses under the A861 and discharges into the Narrows to the north of the existing slipway. This watercourse originates on the forested hill of Druim na Birlinn. The watercourse carries low volumes of water and is considered to be highly disturbed and of relatively low quality in terms of aquatic habitat (see Figure 10.2.2).

Figure 10.2.2: Watercourse through Corran, March 2022

There are no watercourses within, or proximal to, the scoping boundary on the Ardgour side of the Narrows.

10.2.4 Physical Parameters

Physical parameters for marine water quality were obtained from MOWI, as sampled at their 'Linnhe' finfish farm (Site ID FS0240), approximately 400m north-west of the CFIIS scoping boundary. MOWI undertake water quality monitoring of their fish farm twice daily. Temperature measurements between June 2018 and September 2022 recorded lowest and highest readings at 5m water depth of 5.1°C and 14.6°C, recorded on the 7th of February 2020 and the 10th of September 2022 respectively.

10.2.5 Bathing Waters

No designated bathing waters are located in the vicinity of the proposed CFIIS (SEPA, 2023c). The nearest SEPA monitored bathing water is located ~34km away at Ganavan, near Oban (Grid Reference: NM 8620 3281).

10.2.6 Shellfish Water Protected Areas & Classified Shellfish Harvesting Areas

Shellfish Water Protected Areas (SWPA) are used for commercial shellfish cultivation. Water quality in these designated areas is regularly monitored by Food Standards Scotland (FSS) and classified by SEPA. The closest designated shellfish waters and approximate distances and direction by sea from the development site include:

- Loch Leven (SWPA 36), 6km south-east;
- Loch Eil (SWPA33), 16km north; and
- Lismore (SWPA25), 21km south-west;

These SWPAs were all classified as 'Good' in the most recent 2018 classifications published by SEPA (SEPA, 2023d). These SWPAs contain shellfish rearing sites which are listed as currently active. One additional shellfish rearing site exists in Loch Linnhe outwith SWPAs. This is Camas

a Chuilinn, operated by Fass Fern Mussels, ~6km north-west of the CFIIS Scoping boundary. Classified Shellfish Harvesting Areas also exist in the SWPAs listed, and over the Camas a Chuilinn shellfish rearing site (Scotland's Aquaculture, 2023).

10.2.7 Seawater Finfish Sites

The nearest fish farms to the CFIIS proposed development and approximate distances from the Scoping boundary include:

- 'Linnhe' (Site ID FS0240), operated by MOWI Scotland Ltd, ~400m north-west;
- 'Gorsten' (Site ID FS0237), operated by MOWI Scotland Ltd, 7.5km north-east;
- 'Loch Leven' (Site ID FS0244), operated by MOWI Scotland Ltd, 8.5km south-east by sea; and
- 'Shuna Point' (Site ID FS1354), operated by Scottish Sea Farms Ltd, 16km.

10.2.8 Drainage and Wastewater Management

Buildings at Ardgour and Corran are plumbed into the Scottish Water network for potable water and wastewater management.

There are two Scottish Water emergency overflow outfalls currently in use at Ardgour, one near the storage building, the other stemming from a pumping septic tank near the village green. There are four redundant outfall pipelines on the Ardgour foreshore north-west of the existing slipway, which are no longer in use.

There is an emergency overflow outfall at Corran. Immediately south of the existing slipway, discharging into the Narrows.

All surface rainwater run-off from the villages and existing ferry infrastructure currently drains into the Corran Narrows without treatment.

10.3 Potential Construction Effects

10.3.1 Marine

Potential effects on marine water quality associated with the construction phase of the development include:

- Increase in solids in the water column; and
- Pollution from a loss of containment.

10.3.1.1 Increase of Solids in the Water Column

An increase of solids in the water column of the marine environment may arise from both onshore and offshore construction activities.

The potential for mobilisation of particulates is largely dependent on the particle size and water currents. Lighter, smaller particles (silts) stay suspended over longer periods, allowing greater geographical dispersal. Larger, heavier particles like sand and gravels quickly drop out of the water column, limiting geographic spread (Jones *et al.*, 2016). Strong currents not only transport solids away from their source of origin, they also add energy to them, such that they stay within the water column for longer.

10.3.1.1.1 Onshore Sources of Solids

Surface water run-off containing silts entering the marine environment can increase solids in the water column. The construction phase of the CFIIS will give rise to areas of exposed soils and require the storage of soils and aggregate material, especially on the Nether Lochaber side. As water flows over exposed ground or around material stockpiles, it picks up small solids (i.e. silt) from these sources. Subsequently, this silty surface water run-off may increase concentrations of solids in the water column if permitted to enter the aquatic environment. Surface water run-off from soils is also likely to have an increased organic content, which may have an effect on water chemistry due to the associated oxygen demand of the materials.

Whilst volumes of potential surface water run-off are unlikely to cause a significant change to the water quality of Loch Linnhe, localised effects are possible as a result of the CFIIS without the implementation of effective surface water management measures. Standard construction site mitigation for surface water management will be implemented as outlined in Section 10.6: Mitigation, to minimise loss of silts to the marine environment.

As discussed in Section 9.2.4, there is no known source of chemical contamination of soils, if any are found, then their management will also ensure that they are not allowed to wash into the sea, so as not to impact upon water quality. Release of soils potentially containing fragments of non-native species into the marine environment does not raise a particular concern, as terrestrial species will not grow in the marine environment. Furthermore, having been subject to saline conditions, any fragments of INNS are likely to become unviable, and therefore highly unlikely to be able to establish elsewhere, if they were to wash up on land.

10.3.1.1.2 Offshore Sources of Solids

Offshore activities with the potential to increase solids in the water column include:

- Dredging activities;
- Rock stripping and possible rock blasting; and
- Land reclamation.

Marine sediments at the Corran Narrows consists predominantly of coarse sands and gravels, with a small proportion of cobbles and silty sands (refer Section 11: Seabed, Coastal Processes and Flooding for further details). Notably, the site of marine development on the Nether Lochaber side of the Narrows is primarily exposed bedrock, with very low volumes of overlying sediment, reflecting high energy currents through this area.

The predominantly coarse nature of the seabed in the vicinity of the CFIIS means that any material entering the water column during dredging activities would likely drop out and return to the seabed quickly. As such, notable sediment plumes are not predicted. The predominant water flow on the Ardgour side, on both spring and ebb tides, is anti-clockwise away from the fish farm and towards the area to be dredged at the overnight berthing structure and Ardgour slipways. Hence, sediments are predicted to be deposited on the southern and eastern sides of the Ardgour marine construction site.

Rock stripping (with the potential for rock blasting) on the Nether Lochaber side, will create a spoil with a range of particle sizes. The material will be removed from the seabed for use in the land reclamation or breakwater construction. The majority of the material will drop out of the water column due to its size, however, finer materials could be mobilised into the water column during these works. Due to the speed of the tides through the Corran Narrows and

passing construction works on the Nether Lochaber side, it is likely that any fines will be rapidly dispersed north or south in Loch Linnhe, depending on the currents at the time. Due to the relatively small volumes of fines particles in this area, the activities are unlikely to give rise to visual plumes or lead to sedimentation issues.

Land reclamation typically includes the placement of larger rocks around an outer edge to create a bund which infill material can be placed within, the infill material needs to be suitable engineered fill, as such it will be of low silt content (such as material won during dredging). Due to the low volumes of silts in this infill material, it is unlikely that this activity will give rise to a notable increase in solids in the water column.

Although any increases in solids in the water column are expected to be localised and short lived, it is recognised that changes in sediment loading, if they were to occur, could have detrimental effects on water quality which could have knock on implications for the fish farm. As such, monitoring and mitigation is proposed in Section 10.6: Mitigation.

10.3.1.2 Pollution from a Loss of Containment

A loss of containment of hazardous substances, if allowed to enter the water environment, may have a detrimental effect on water quality. Such substances may include fuels, oils, paints, trade effluent, waste materials, concrete washings and concrete from pours in the marine environment.

The potential for release of concrete during concrete pours will be reduced by utilising pre-fabricated concrete units or marine-compatible concrete and appropriate shuttering. Relatively low volumes of hazardous material will be required on site, such that the impact from a loss of containment would be low. The likelihood of such a loss will also be low, as hazardous materials will be managed by appropriate storage and handling as discussed in Section 15.5. Mitigation in alignment with the pollution prevention hierarchy will minimise potential effects in the event of a loss of containment event as described in Section 9.5: Mitigation.

10.3.2 Fresh Water

The only construction works planned near the watercourse at Corran are associated with the construction of the shared use path, as such potential impacts on fresh water are limited.

10.3.2.1 Increase of Solids in the Water Column

As discussed in Section 10.3.1.1.1, surface water run-off from areas of exposed or stored soils can give rise to solids entering watercourses. This can increase turbidity in the stream and lead to soils dropping out on the base of the watercourse, reducing the quality of the habitat present. The small scale of the works in the vicinity of the watercourse, and the implementation of standard construction site surface water management as outlined in Section 10.6: Mitigation, make it highly unlikely that there will be silts entering the watercourse. Furthermore, if an increase in solids were to occur, adverse effects on this small, already disturbed watercourse are not expected to be significant.

10.3.2.2 Pollution from a Loss of Containment

Due to the location of the bulk of the development works and the construction compounds relative to the watercourse in Corran, there is a very limited pathway for hazardous substances to enter this watercourse. Hence, there is a very low risk of pollution to this terrestrial surface

water from the CFIIS construction. The risk of hazardous substances entering the watercourse from a loss of containment will be further reduced with the implementation of mitigation outlined in Sections 9.5, 10.6 and 15.5.

10.4 Potential Operational Effects

10.4.1 Marine

10.4.1.1 Increase of Solids in the Water Column

Maintenance dredges may be required during operations to maintain necessary water depths for the vessels. As discussed in Section 10.3.1.1.2, dredging activities are unlikely to give rise to significant issues associated with solids in the water column due to the low volume of silts present. Maintenance dredges, if required, will also be managed through the marine licensing process.

10.4.1.2 Pollution from a Loss of Containment

Operational sources of hazardous materials, with the potential to affect water quality in the event of a loss of containment, include diesel for the temporary generator, effluent from the toilet block on the Nether Lochaber side and litter sources from the marshalling and car parking areas.

Storage locations of the diesel infrastructure (i.e., temporary generator and associated fuel tank, if required) will be determined during detailed infrastructure design. The risk of pollution from a loss of containment will be minimised through embedded pollution prevention controls as the design will ensure in alignment with GBR 28 of the CAR, which includes the need for appropriate secondary containment. Refuelling procedures will be in place to ensure appropriate handling of fuels. In the long-term, the risk of fuel spillages reaching the marine environment will be reduced as the new, primary vessel will be electric, and therefore not generally requiring refuelling with diesel.

10.4.1.3 Sewage Disposal

The sewage disposal route from the toilet block on the Nether Lochaber side will be connected into the local Scottish Water network or treated locally prior to discharge. In the event of the latter, then the design will take into consideration CAR and will be subject to Registration or Simple Licencing by SEPA depending on the sizing of the facility. Due to the existing control mechanisms in place to manage sewage discharges, there is no need to consider them further within the EIA process.

10.4.2 Fresh Water

No potential effects on terrestrial watercourses have been identified for the operational phase of the CFIIS. Operations associated with the Corran Ferry are moving away from the watercourse in Corran.

10.5 Water Framework Directive Considerations

In the absence of specific Scottish Government guidance, the Environment Agency's WFD assessment scoping template (Environment Agency, 2023) was completed, to provide an understanding of the need for WFD assessment topic area considerations. The completed WFD scoping is provided in Appendix 1. The scoping exercise concludes that only impacts on Biology: habitats and Invasive Non-Native Species needs further consideration.

10.6 Mitigation

Surface water run-off will be minimised by ensuring soils and materials are appropriately handled and stored (see Section 15.5). In addition, measures such as geotextile silt fencing will be utilised to prevent silty water running into the marine or terrestrial watercourses in alignment with GPP 5: Works and Maintenance in or Near Water (NIEA, DEFRA, SEPA and NRW, 2018c).

Visual inspections will be conducted regularly during dredging, blasting and marine rock breaking activities to monitor water turbidity caused by increased sediment loading. If a sediment plume is observed to be not dissipating/settling as expected, or is being transported away from the Narrows, the need for engineered containment measures (e.g., a silt curtain) will be considered.

Storage and handling of potentially polluting materials will be managed appropriately as outlined in Section 15.5, this will protect against loss of containment. Furthermore, in the event of a loss of containment, the Pollution Incident Response Plan as discussed in Section 9.5 will be employed to minimise effects due to a pollution incident.

These mitigation measures have been captured in the ISoM (Section 24) for implementation during construction.

10.7 Proposed Impact Assessment

The operational phase of the CFIIS will not give rise to any potentially significant effects on marine or terrestrial water quality. The implementation of mitigation as outlined in Section 10.6 will similarly ensure any potential impacts from construction activities are also non-significant. As such it is proposed that effects on water quality are **scoped out** of the EIA. A summary of scoping outcomes is outlined in Table 10.7.1.

The WFD Scoping Assessment identified the need to further consider INNS and effects on benthic habitats such as subtidal kelp beds. These effects are discussed further in Sections 14.1 all relevant impacts will be taken forward to EIA as detailed in Section 14.1.5.

Table 10.7.1: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Marine		
Increase of Solids in the Water Column	Out	Out
Pollution from a Loss of Containment	Out	Out
Sewage Disposal	NA	Out
Fresh Water (Watercourse)		
Increase of Solids in the Water Column	Out	NA
Pollution from a Loss of Containment	Out	NA

NA = Not applicable.

11 Seabed, Coastal Processes and Flooding

The focus of this section is potential effects on the seabed, coastal processes and flooding associated with the construction and operation of the proposed CFIIS. It is recognised that the seabed is a habitat and hence changes to it could have implications for Marine Biodiversity, this is however, considered within Section 14: Marine Biodiversity.

11.1 Policy and Guidance

NMP policies that are relevant to this section are as follows:

- **GEN 8 Coastal Process and Flooding**: Developments and activities in the marine environment should be resilient to coastal change and flooding, and not have unacceptable adverse impacts on coastal processes or contribute to coastal flooding; and
- **GEN 9 Natural Heritage:** Marine planning should consider opportunities to protect important geodiversity features and prevent deterioration or enhance where appropriate. Where geodiversity features are qualifying or protected features of designated sites, activities must be managed accordingly under the relevant legislation. Marine planners and decision makers should consider impacts on geology, taking into account their significance. Substantial loss or harm should be exceptional and should only be permitted if this is necessary to deliver social, economic, or environmental benefits that outweigh the harm or loss (Scottish Government, 2015a).

NPF4 policies that are relevant to this section and the proposed CFIIS development are as follows:

- ***Policy 10 Coastal Development:*** *To protect coastal communities and assets and support resilience to the impacts of climate change;*
- ***Policy 22 Flood Risk and Water Management:*** *To strengthen resilience to flood risk by promoting avoidance as a first principle and reducing the vulnerability of existing and future development to flooding* (Scottish Government, 2023).

In the local context, the HwLDP outlines some policies that are relevant to this section:

- ***Policy 64*** *Flood Risk: Development proposals should avoid areas susceptible to flooding and promote sustainable flood management. Development proposals within or bordering medium to high flood risk areas, will need to demonstrate compliance with Scottish Planning Policy (SPP) through the submission of suitable information which may take the form of a Flood Risk Assessment* (THC, 2012).

Relevant guidance used in the section includes:

- Flood Risk: Planning Advice (Scottish Government, 2015c);
- Pre-Disposal Sampling Guidance (Marine Scotland, 2017); and
- Pre-application Advice for Major Developments pack (THC, 2023a).

11.2 Baseline

11.2.1 Seabed

Loch Linnhe is situated close to the south-westerly extension of the Great Glen Fault. The fault divides the bedrock of the region into the Moine metamorphic series and the Dalradian metamorphic series, generally composing the west and east shores, respectively (McIntyre and Howe, 2010). However, in this specific area, the peninsula on the west side of Loch Linnhe (Ardgour) is composed of Dalradian metamorphic rocks which are also found on the east shore. Hence both sides of the site and the seabed in between are composed of rocks of the same age and similar nature. It is a deep channel with a sheer rock face of depths of up to 150m (Hydro-International, 2015), however, the inner basin (Corran Narrows to Loch Eil) and outer basin (on the seaward side of the Corran Narrows), are separated by a shallow sill. The sill has a maximum depth of 18m and width of 290m at high water level (Edward and Sharples 1986). The seabed bathymetry of the Corran narrows can be seen fully in Drawing 2387-901A.

Figure 11.2.1 produced by Smeaton *et al.* (2019) map out type and distribution of sediment in Loch Linnhe based upon sediment sampling, organic carbon content mapping and available literature. The majority of sedimentation in the narrows is predicted to be gravel and coarse sediment.

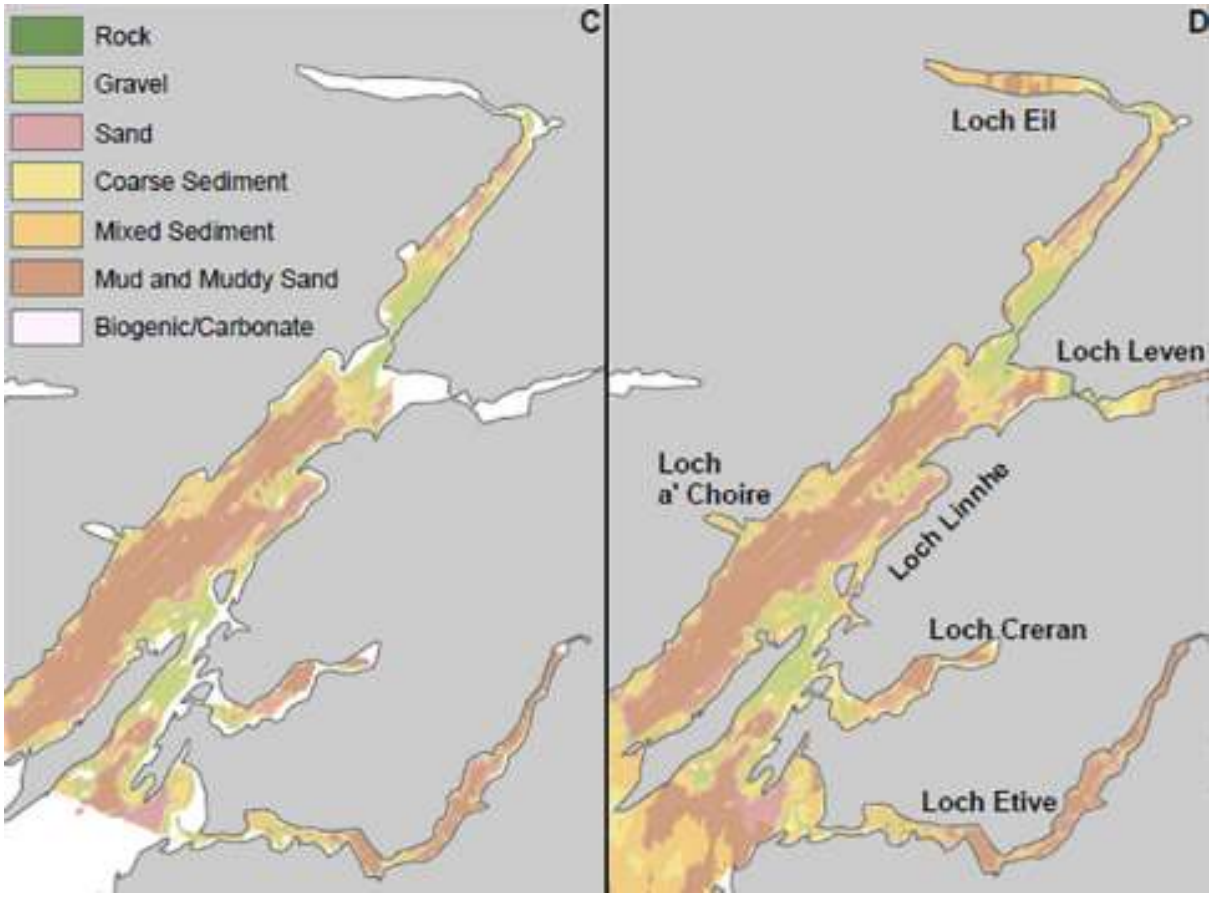

Figure 11.2.1: Sediment Type in Loch Linnhe (C) Tier 2 Data, (D) Tier 3 Data (Smeaton and Austin, 2019)

The paper correlates with ground investigation works conducted at the proposed CFIIS in late 2023. Boreholes completed on the Nether Lochaber side encountered very limited depths of overburden (gravel/cobble) above the psammite (metamorphic sandstone) rockhead. As a result, upper sediment sampling techniques were not able to recover material for analysis. Rockhead was found to be psammite over the full depth of the boreholes.

Ground investigation sampling was completed at Ardgour, with sediment being encountered for the full depth of all cores that were completed in this area. Upper sediments were typically made up of cobbles, gravel, sand and some silt. Across the sediment samples recovered, cobbles were attributed to 6%, gravel 45%, sand 41%, silt 7% and clay 1%. At lower elevations within the sediments, typically at 8m depth and below, sands and silts predominate. Depth to rockhead was not able to be verified on the Ardgour side, even with boreholes typically extending 30m into seabed deposits.

Subsequent upper sediment sample analysis showed no significant cause for concern with regard to contamination (Causeway Geotech, 2024). No samples were above the prescribed Action Level 1 from the Pre-disposal Sampling Guidance (Marine Scotland, 2017).

There are currently 3 de-energised SSE subsea cables that transit along the seabed in an area 50m to 200m north of the existing slipways. The cables have been placed on top of the seabed, and no concrete mattresses or rock has been placed on them for protection or to retain them in location.

11.2.2 Coastal Processes

Loch Linnhe is one of the largest sea lochs on Scotland's west coast and is regarded as having a fjordic character where meteorological forcing, freshwater inputs and seabed topography control the circulation (Berx *et al.*, 2015). The inner basin and outer basin of Loch Linnhe are separated at Corran Narrows by a shallow, narrow sill. This narrow passage contributes to the sea-loch's relatively strong cross-sill tidal currents. The maximum currents speeds across the Corran Narrows sill is 4.9 knots and the mean spring tidal range is 3.7m (Hydrographic Department, 1977). The interaction of tidal flow with the topography of the sill also generates internal waves, turbulent mixing and considerable re-suspension of sediments (Taylor, 1997). Additionally, internal waves are also created by the steady slope within the outer basin up to the Corran Narrows. Due to the fjordic characteristics of Loch Linnhe, wind also channels through the valley increasing wave action. In contrast, the entirety of Loch Linnhe is mostly sheltered from the majority of wind and wave action from the Atlantic ocean.

Some scour is currently observed adjacent to both Corran and Ardgour' s existing slipway structures however, this is largely vessel induced and not a result of coastal processes.

11.2.3 Flooding

Both Corran and Ardgour are within the Loch Linnhe, Lochy (Inverness-shire) and Loch Siel catchment group and are not considered a Potentially Vulnerable Area (PVA) with regard to river flooding. The catchment area has seven PVAs but are generally located along or at the head of sea lochs (THC, 2012) and therefore not associated with the Corran Narrows. A review of SEPAs flood risk maps also identified that there is no specific risk identified with regard to surface water. However, as depicted in Figure 11.2.2, both Corran and Ardgour are at high risk of coastal flooding, which means that each year the area has a 10% chance of coastal flooding (SEPA, 2024a). It is noted that the coastal flood region is immediately adjacent to Loch Linnhe in the lowest lying areas.

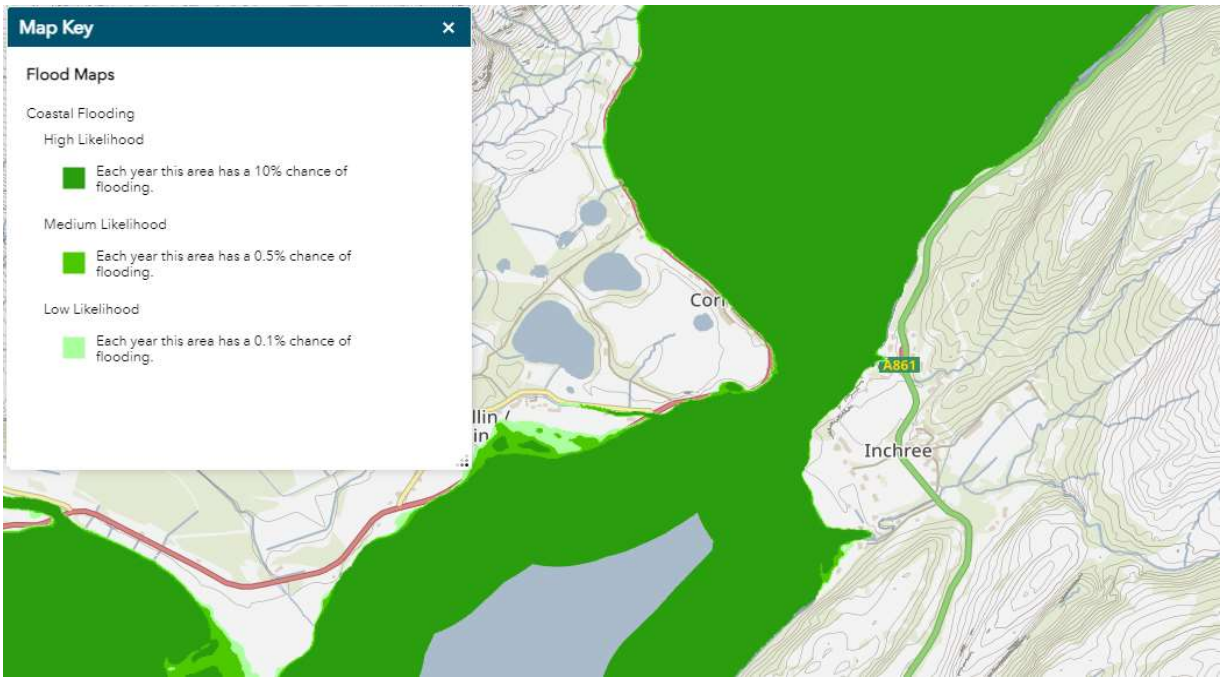

Figure 11.2.2: Coastal Flood Risk Map (SEPA, 2024b)

Correspondence from SEPA provided in the Pre-application Advice for Major Developments Pack (THC, 2023a) expressed that the flood risk water levels developed within the Caol and

Lochyside Flood Protection Scheme Study (JBA Consulting, 2017) would be applicable to Ardgour and Nether Lochaber sides of the CFIIS. The levels are as follows:

- 1 in 200 Year Still Water Level: +4.69m OD (which is equivalent to +6.65m CD);
- Climate Change Allowance: +0.86m; and
- Freeboard Allowance: +0.60m (for floor levels of new buildings not for 'water compatible use').

Hence, elements above 5.55m OD are unlikely to be flooded in event of a 1 in 200 year storm, taking account of climate change.

Various points of the existing ferry infrastructure are below the aforementioned levels. On the Nether Lochaber side; the car park, toilet facility and parts of the marshalling area are below 5.55m OD. With regard to the Ardgour side, the A861, the ferry office, marshalling area, storage building and the pier head, along with other commercial and residential properties are also located on ground which is below the 5.55m OD still water level. Commercial properties offering overnight accommodation and residential properties adjacent to the A861 may have floor levels which are at, or below, 6.15m OD level (the SEPA provided flood risk water level including freeboard allowance for new properties of this type).

11.3 Potential Construction Effects

11.3.1 Seabed

The following construction techniques have the potential to impact upon the seabed:

- Dredging;
- Rock stripping and possible rock blasting;
- Dredge disposal activities;
- Land reclamation and rock armour placement; and
- Cut and cap cable removal techniques.

Dredging, rock stripping and any rock blasting will include the removal of sediment and bedrock, changing the bathymetry of the seabed. This may result in knock on effects to coastal processes, which is discussed further in Section 11.3.2. On the Ardgour side, it is expected that dredging will involve the removal of sediment only and will not reach rockhead level, or encounter significantly different sediment layers, therefore existing seabed characteristics will not notably change. On the Corran side, dredging is associated with psammite bedrock, and again will not result in a change to the seabed characteristics as the rock strata doesn't change type within the depth being removed. As seabed characteristics will not change significantly. There will also be an associated loss to geological features during bedrock removal, however, the volume removed is not significant, has no designation, and there are ample examples of the same geological features throughout the area.

GI works conducted by Causeway Geotech, confirmed that the sediment type at the location of the CFIIS is mainly comprised of gravel and sand, with small portions of cobbles and silt. Gravel and sand sediments will likely drop out rapidly from the water column, with any impacts remaining localised and non-significant. There is also potential for remobilisation of contaminated sediments, but as mentioned in Section 11.2, pre-dredge sample analysis conducted in 2024 showed no evidence of contamination (Causeway Geotech, 2024) and hence is not considered a risk.

The intent is to use the won bedrock and sediments from dredging as infill for land reclamation works or other infill works, due to their suitable physical and chemical properties. However, should there be a requirement for disposal at sea, this will be managed through the BPEO and dredge and disposal licence process.

Land reclamation and rock armour placement will alter the bathymetry of the seabed, which may result in knock on effects to coastal processes and is discussed further in Section 11.3.2. There will also be an associated loss of the seabed itself, but this loss is so small in nature that any impacts associated with loss will not be significant.

Sectional removal of two sub-sea cables (which will be de-energised by the time of the works) will be completed using a cut and cap cable removal technique. Only cable sections conflicting with the construction footprint at Ardgour will be removed. Some form of anchorage at the cut point will be required to ensure the remaining cables are still secured in position on the seabed. As the cable is placed on the seabed, its removal is not predicted to cause any direct effects. The installation of a localised piled restraint, with a concrete cap, to anchor the capped end of the removed cables will affect a very small area of the seabed, and is therefore not considered significant.

11.3.2 Coastal Processes

The construction activities themselves are not anticipated to cause significant impacts to coastal processes and therefore do not require further consideration.

11.3.3 Flooding

Construction activities of the CFIIS are not expected to contribute to an increase in flooding events or risk.

11.4 Potential Operational Effects

11.4.1 Seabed

During operations of the proposed CFIIS, the following activities may give rise to impacts to the seabed:

- Vessel movements; and
- Maintenance dredging.

Vessel movements have the potential to remobilise sediments during manoeuvring and berthing activities due to their propulsion systems. It is noted that this is only relevant where mobile sediments are present, which is likely to be the Ardgour side only. As a result there is a small risk that localised scour holes could be generated on the seabed i.e. along the slipways at Ardgour or at the overnight berths. The depth and extent of any scour holes is highly dependent on vessel manoeuvres and water levels at the time of manoeuvring. Formation of scour holes in one area of the seabed can result in deposition of material in another area of the seabed which can lead to high spots and obstructions requiring maintenance. As scour is limited to areas where there are mobile sediments, and when water levels are low, impacts are not expected to be significant.

Furthermore, as detailed in in Section 11.2, the sediments present around the Corran Narrows (primarily sands and gravels) are unlikely to move significant distances. However, should any maintenance dredging be required, it is expected to be infrequent and small scale. Appropriate

dredge sample analysis would be undertaken to ensure that the material is not contaminated. The sampling results would then be used to inform the BPEO report, with the dredging operations controlled through the licensing process. The infrequent requirement for this is such that there will not be notable impacts to be seabed due to removal of material. It is noted that dredging would not involve the removal of bedrock and would be only to achieve design depths.

11.4.2 Coastal Processes

Land reclamation, and to a lesser extent, the proposed bedrock removal proposed for the CFIIS has the potential to alter the wave and tidal climate, wave directions and geomorphological processes within the Corran Narrows. It is recognised that the shape of the development coupled with the narrow nature of the waterbody in which the development lies will influence hydrographics, sediment transport and thus coastal processes around the Corran Narrows.

Modelling thus far has been undertaken to ensure the design feasibility of the proposed development, with particular regard to the shape and nature of the overnight pier, breakwater and slipway infrastructure. This has also included 1 in 50 year storm conditions to ensure the overnight berthing structure is sufficient to protect berthed vessels during extreme weather events. No significant impacts to coastal processes have been identified thus far, however, further modelling will be completed as the design matures in order to fully understand potential impacts and refine the design of the CFIIS, if necessary.

11.4.3 Flooding

The proposed CFIIS will take the flood levels outlined in Section 11.2 into consideration by design. It is recognised that the area, particularly at Ardgour, is already prone to some level of coastal flooding and although creation of land-reclamation and structures does technically result in encroachment on the volume of the coastal waterbody, the impact of this will be negligible and is not anticipated to increase flood risk. Impacts with regard to coastal processes as a result of encroachment on the waterbody are discussed in Section 11.4.2.

Existing ferry infrastructure (slipways, overnight berths, breakwater etc) require to be water compatible and have to be located within the functional floodplain for operational reasons.

It is recognised there is existing non-development related infrastructure, particularly in Ardgour, that are below SEPAs prescribed 1 in 200 year flood levels. Although the development will not protect these properties from flooding, the development will be designed so as to not exacerbate the flood risk from incidents such as by tidal locking of drainage systems.

11.5 Proposed Impact Assessment

No significant impacts to the seabed are anticipated during construction and operations of the CFIIS, therefore it is proposed they are **scoped out** of the CFIIS EIA. It is proposed that construction impacts to coastal processes and flooding are **scoped out** of the EIA, as no impacts are anticipated during this phase.

Coastal modelling is required to understand the effects of coastal process on the marine components of the CFIIS and ferry operations, along with the effects of the CFIIS on coastal process. Modelling is used to inform the design, hence it is unlikely that the CFIIS design taken forward for consenting will have a significant effect on coastal processes. It is however, appropriate to **scope in** coastal processes to the EIA to allow the model findings to be

presented to demonstrate that the design is acceptable. As flood risk in this area is primarily due to coastal processes, there is a need to **scope in** operational flood risk into the EIA.

In summary, impacts of the construction and operational phases and whether it is proposed they are scoped in or out of the CFIIS EIA are outlined in Table 11.5.1. Impact assessment methodologies are then detailed where appropriate. The approaches to understand coastal processes and flood risk are detailed in Sections 11.5.1 and11.5.2 respectively.

Table 11.5.1: Seabed, Coastal Processes and Flooding Scoping Summary

Potential Impact	Phase	
	Construction	Operations
Impacts to the seabed	Out	Out
Impacts to coastal processes in the Corran Narrows	NA	In
Impacts to flood risk	NA	In

NA = Not applicable.

11.5.1 Coastal Processes

The studies will be undertaken by RPS Consulting, utilising their in-house MIKE modelling system, based on the Danish Hydraulics Institute's software which is one of the world's leading hydraulic modelling software for the marine environment. The main part of the modelling study will be undertaken using the integrated model MIKE 21/3 Coupled FM. This model includes tidal, wave, sediment transport and water quality modules interlinked and all running on a common flexible mesh bathymetry. Information sources that will also be utilised for the study include the following:

- RPS Consulting's existing and proposed models of the inner and outer basin of Loch Linnhe and the Corran Narrows;
- Up to date bathymetric survey, ground investigation and current monitoring data;
- Wind data UK Met Office for extreme winds speeds over the UK and data from the global atmospheric models;
- Acoustic Doppler Current Profiler data (recording tidal currents over a lunar month);
- SEPA/Environment Agency coastal and estuary flood boundary data sets;
- EA/DEFRA report FD2308 Joint Probability: Dependence Mapping and Best Practice (Environmental Agency and DEFRA, 2005).

As the tidal currents around the Coran Narrows are quite strong, the currents will at times have a significant impact on the wave climate approaching the proposed infrastructure works. Thus, the wave module simulations will be undertaken at times of high current flows as well as at periods around high and low water when the tidal currents are weak.

The Spectral Wave (SW) module will be used to simulate the 1 in 0.1, 1 in 1, 1 in 10 and 1 in 50 year return periods storms from both the north to east and south to west sectors for both extreme joint probability events at high water and with flood and ebb tidal flows. The results of the wave simulations will provide information for reviewing operational impacts, design of the marine structures, land reclamation etc, in terms of structure stability and overtopping.

The impact on the sediment transport regime will be simulated using the coupled model based on 1 in 1 year return period storms with mean tide current flows. The model simulation will produce the littoral currents (tidal and wave driven currents) which together with the waves and the bed sediments allows the model to output the sediment transport pathways and rates.

The study of the impact of wave reflections from the structures and land reclamation will be assessed by running Boussinesq wave models of the area around each of these fixed structures. The boundary conditions for these small local models will be taken from the results of the still water wave module simulations.

All the model simulations noted above will be undertaken for both the current sea levels and for the sea level predicted to occur by 2100.

11.5.2 Flooding

A Flood Risk Assessment will be prepared to understand the impacts to flood risk at the development, but also the surrounding areas. The information provided will align with SEPAs Technical Flood Risk Guidance for Stakeholders (SEPA, 2022). In addition, a Drainage Impact Assessment, written in accordance with the Highland Councils Supplementary Guidance: Flood Risk and Drainage Impact Assessment, will be undertaken. The results of both risk assessments will then be used to inform the EIA.

12 Biodiversity

This section introduces relevant legislation, policy, plans and guidance associated with biodiversity receptors of the CFIIS. This section also identifies statutory designated sites that have been designated for biological quantifying interests or features (noting that some of the Sites of Special Scientific Interest (SSSIs) included within the assessment are also designated for geological qualifying features, and where relevant, are discussed in Section 9: Geology, Land and Soils). The implications of the potential ecological connectivity to designated sites included within Section 12.2 (where identified), will be discussed further in the relevant biodiversity chapters:

- Section 13: Terrestrial Ecology and Ornithology; and
- Section 14: Marine Ecology.

12.1 Legislation, Policy, and Guidance

12.1.1 Legislation

12.1.1.1 Marine (Scotland) Act 2010

The Marine (Scotland) Act 2010 sets out duties on Scottish Ministers' to ensure Scotland's seas are sustainably managed and contain provisions for new Marine Protected Areas (MPAs) in Scottish territorial waters. In order to help meet this requirement, the JNCC and NatureScot produced a list of species and habitats occurring in Scottish waters, which are noted for their conservation importance, referred to as 'Priority Marine Features (PMFs)'. PMFs include benthic and intertidal habitats, marine mammals, fish, and invertebrate species (Tyler-Walters *et al.*, 2016). Inclusion in the PMF list itself does not provide legal protection, however, due consideration must be provided in impact assessments. As such, all PMFs are considered sensitive for the purpose of this assessment.

12.1.1.2 The Birds Directive

Directive 2009/147/EC of the European Parliament and of the Council on the Conservation of Wild Birds (commonly known as 'The Birds Directive'), led to the classification of Special Protection Areas (SPAs) for the presence of bird species listed in Annex I of the directive. The Birds Directive also provides legal protection for all wild bird, their nests, eggs and habitats within Europe, which transposed into Scottish law via the Wildlife and Countryside Act 1981 (as amended) (WCA).

12.1.1.3 Wildlife and Countryside Act 1981 (as Amended)

The WCA protects much of the UK's native wildlife, includes amphibians and reptiles (collectively known as 'herptiles'), wild birds, wild plants and fungi. Furthermore, additional protection is given to invertebrate species listed under Schedule 5 of the WCA and plant species listed under Schedule 8 of the WCA.

The WCA further protects native biodiversity by establishing offences in relation to the control of invasive non-native species (INNS) listed under Schedule 9 of the act. The WCA aims to limit the spread of INNS by making it a legal offence to knowingly or recklessly allow INNS to spread into the wild.

12.1.1.4 Habitats Directive and Habitats Regulations

The European Union Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (commonly known as 'The Habitats Directive'), led to the establishment of Natura 2000 Sites (now known as 'European Sites' in the UK) and European Protected Species (EPS). The Habitats Directive is transposed into Scottish law via the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland) (commonly known as the 'Habitat Regulations'), as discussed in Section 4.1.6: Habitats Directive.

The Habitats Regulations make it an offence to intentionally or recklessly capture, injure, kill, disturb, own or trade animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, own or trade any of the plants listed in Schedule 4. However, these actions can be made lawful through the granting of licenses by the appropriate authorities.

In addition, The Habitats Regulations determine that, if a plan or project could affect a European Site (i.e. any SPA, Special Area of Conservation (SAC), candidate SAC (cSAC), MPA or proposed MPA (pMPA)), then there are certain considerations that must be made before the proposal can proceed. In particular, Regulation 48 of the Habitats Regulations dictates that any plan or project, which may result in a 'Likely Significant Effect' (LSE) to any qualifying interest/feature associated with a European Site (either alone or in combination with other plans or projects), and is not directly connected with or necessary to the management of the site, shall be subject to an AA. The AA must demonstrate that the proposal will not adversely affect the integrity of the site. Where required, it is the responsibility of the competent authority to carry out a Habitats Regulation Assessment (HRA) based on robust, scientific information provided by the project developer to determine whether there will be any LSE. If no LSE is anticipated, it is likely that an AA will not be required.

It is understood that the CFIIS is not directly connected with, or necessary to, the management of any European Site. Therefore, it is possible that an AA will be required if LSEs are expected to any qualifying interests/features associated with European Sites (see Section 13: Terrestrial Ecology and Ornithology and Section 14: Marine Ecology for further details).

12.1.2 Planning Policy and Plans

12.1.2.1 National Planning Framework 4

The National Planning Framework 4 (NPF4) aims to 'protect biodiversity, reverse biodiversity loss, deliver positive effects from development and strengthen nature networks.' Specifically, Policy 3 of NPF4 states:

a) Development proposals will contribute to the enhancement of biodiversity, including where relevant, restoring degraded habitats, and building and strengthening nature networks and the connections between them. Proposals should also integrate nature-based solutions, where possible.
b) Development proposals for national or major development, or for development that requires an Environmental Impact Assessment will only be supported where it can be demonstrated that the proposal will conserve, restore, and enhance biodiversity, including nature networks so they are in a demonstrably better state than without intervention. This will include future management.
c) Proposals for local development will include appropriate measures to conserve, restore and enhance biodiversity, in accordance with national and local guidance. Measures should be proportionate to the nature and scale of development.

The requirements for biodiversity enhancement associated with the project will be considered as part of a Biodiversity Net Gain (BNG) Assessment for the project development area. The BNG Assessment will be utilised during the EIA process to determine the significance of impacts associated with habitat loss (for further detail please refer to Section 13: Terrestrial Ecology and Ornithology).

12.1.2.2 UK Biodiversity Action Plan

The UK Biodiversity Action Plan (BAP) was published in 1994 and was the UK Government's response to the Convention on Biological Diversity (CBD), which the UK signed up to in 1992 in Rio de Janeiro (JNCC, 2024). The CBD called for the development and enforcement of national strategies and associated action plans to identify, conserve and protect existing biological diversity, and to enhance it wherever possible. UK BAP priority species and habitats were those that were identified as being the most threatened and requiring conservation action under the UK BAP. The original lists of UK BAP priority species and habitats were created between 1995 and 1999, and were subsequently updated in 2007, following a 2-year review of UK BAP processes and priorities, which included a review of the UK priority species and habitats lists.

12.1.2.3 Planning Advice Notes and Local Development Plans

Planning Advice Note (PAN) 60 'Planning for Natural Heritage' makes reference to the UK BAP, as well as Local Biodiversity Action Plans (LBAPs) (such as THC 'Highland Nature Biodiversity Action Plan' (Highland Nature, 2021)) (Scottish Government, 2008). PAN 60 acts as a mechanism for ensuring nationally and locally important species and habitats are conserved and enhanced through focused local action.

- The HwLDP also outlines relevant policy to biodiversity. Relevant policies include:

- **Policy 57**: Natural, Built and Cultural Heritage of the HwLDP provides guiding principles on development with regard to effects on features of local/regional, national and international importance in the natural environment;
- **Policy 58**: Protected Species, outlines that surveys should be undertaken, and mitigation identified to avoid or minimise impacts to protected species. It also outlines under what circumstances development with potential impacts to protected species may be permitted;
- **Policy 59**: Other Important Species, provides that THC will have regard to species in Annex II or V of the EC Habitats Directive, UK and Local (i.e. Highland Nature) BAP priority species or species on the Scottish Biodiversity List if not protected by other means;
- **Policy 60**: Other Important Habitats and Article 10 Features, provide the council shall seek to safeguard the integrity of linear or continuous habitats as "stepping stones" for the movement of wildlife, and will seek to create new habitats supportive of this concept. It also outlines the regard for habitats of Annex I of the EC Habitats Directive, priority habitats of the UK and Local BAPs or habitats on the Scottish Biodiversity List, if not protected by other means; and
- Guiding principles of **Policy 51**: Trees and Development, and **Policy 52**: Principle of Development in the Woodland, note there should be strong presumption in favour of protecting Scotland's woodland resources. The HwLDP specifically references consideration of clear and significant public benefit and compensatory planting for proposed woodland removal.

12.1.2.4 UK Marine Policy Statement

The Marine Policy Statement (MPS) is the framework for preparing Marine Plans and taking decisions that affect the marine environment. It also sets the direction for marine licensing and other authorisation systems in each UK Administration. The MPS applies to all UK waters and provides policy context for which national and sub-national marine plans are developed, implemented, monitored, amended and for the assurance of consistency in marine planning across the UK marine area (Scottish Government, 2020a). In Scotland, this is through Scotland's NMP.

12.1.2.5 Scotland's National Marine Plan

As discussed in Section 4.2.3, the NMP provides GENs, most of which apply to the construction and operations of the proposed CFIIS. GENs specifically relevant to biodiversity include:

- **GEN 9 Natural heritage:** *Development and use of the marine environment must comply with legal requirements for protected areas and protected species; Not result in significant impact on the national status of Priority Marine Features; and protect, and where appropriate, enhance the health of the marine area;*
- **GEN 10 Invasive non-native species:** *Opportunities to reduce the introduction of invasive non-native species to a minimum or proactively improve the practise of existing activity should be taken when decisions are being made*;
- **GEN 13 Noise:** Development and use of the marine environment should avoid significant adverse effects of man-made noise and vibration, especially on species sensitive to such effects; and

- **GEN 21 Cumulative Impacts:** Cumulative impacts affecting the ecosystem of the marine plan area should be addressed in decision making and plan implementation (Scottish Government, 2015a).

The NMP also contains a series of GES descriptors. Those relevant to biodiversity include:

- **GES 1:** *Biological diversity is maintained and recovered where appropriate. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions;*
- **GES 2:** *Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems;*
- **GES 4:** *All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity;*
- **GES 6:** *Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected*;
- **GES 7:** Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems; and
- **GES 11:** Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment. (Scottish Government, 2015a).

12.1.2.6 The Scottish Biodiversity List

The Scottish Biodiversity List is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland (NatureScot, 2020a).

12.1.3 Guidance

Section 13: Terrestrial Ecology and Ornithology and Section 14: Marine Ecology were written in line with CIEEM's 'Guidelines for Ecological Impact Assessment in UK and Ireland: terrestrial, Freshwater, Coastal and Marine' (CIEEM, 2018) and the 'Pre-application Advice for Major Developments' pack provided by THC (THC, 2023a).

Additional guidance in relation to protected species and habitats was sought from THC's development guidance on protected species (THC, 2013a), THC's Local BAP 'Highland Nature Biodiversity Action Plan 2021 – 2026' (Highland Nature, 2022).

The Convention for Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention 1992) guides international cooperation between 15 western European governments for the conservation of the North-East Atlantic region and its resources. OSPAR has developed a list of threatened and/or declining species and habitats. The list is based on nominations of species and habitats which were considered priorities for protection by contracting parties and observers to the commission.

12.2 Designated Sites

A review of NatureScot's SiteLink Portal confirms that the area of the CFIIS is not located within any statutory designated sites nor are there any within the immediate vicinity (NatureScot, 2024). However, it is acknowledged that qualifying interests/features associated with designated sites may be ecologically connected to the CFIIS development site, and hence be ecological receptors of the works. To maintain a proportionate approach to the works, all immobile qualifying terrestrial interests or features associated with designated sites situated within 5km of the proposed works and all mobile qualifying terrestrial interests or features associated with designated sites within 20km of the proposed works and all marine qualifying features associated with designated sites within 30km of the proposed works, have been included within the assessment for potential ecological connectivity (as summarised in Table 12.2.1). Some of the SSSIs included within the assessment are also designated for the presence of geological qualifying features. Where applicable, geological qualifying features are included within Table 12.2.1, however, Section 9: Geology, Land and Soils should be referred to for more detail.

No locally designated sites are identified within 20km of the CFIIS location. The sites listed within Table 12.2.1 include those of the following designations:

- Marine Protection Areas (MPAs);
- Nature Conservation Marine Protected Areas (MPA(NC)s);
- Sites of Special Scientific Interest (SSSIs);
- Special Areas of Conservation (SACs); and
- Special Protected Areas (SPAs).

A search for proposed and candidate designated sites was also carried out, though none were identified.

Table 12.2.1: Statutory Nature Conservation Designated Sites relevant to the CFIIS

Designated Site	Approximate Distance and Direction from CFIIS Site	Qualifying Features	Potential for Ecological Connectivity Yes/No	Evaluation Rationale
Onich to North Ballachulish Woods and Shore SSSI	0.3km SE	**Biological:** • Alkaline fen; • Upland mixed ash woodland; • Upland oak (*Quercus* sp.) woodland; and **Geological:** • Dalradian	No	**Not considered further** – None of the habitats or geological features associated with the SSSI have been identified within the CFIIS Scoping boundary.
Onich to North Ballachulish Woods SAC	0.4km SE	• Base-rich fens; • Mixed woodland on base-rich soils associated with rocky slopes; and • Western acidic oak woodland	No	**Not considered further** – None of the habitats associated with the SAC have been identified within the CFIIS Scoping boundary.
Moidart and Ardgour SPA	1.3km NW	**Breeding:** • Golden eagle (*Aquila chrysaetos*)	Yes	**Considered further in Section 13: Terrestrial Ecology and Ornithology –** There are no known records of golden eagle nesting sites within 1km of the location of the CFIIS (Maguire, 2022). However, golden eagles have a core range of 6km (SNH, 2016), and there is considered to be potential habitat for foraging golden eagle within the vicinity of the works. Hence, there is considered to be potential ecological connectivity between the qualifying interest and the proposed works.
Glen Etive and Glen Fyne SPA	3.8km SSE	**Breeding:** • Golden eagle	Yes	

Designated Site	Approximate Distance and Direction from CFIIS Site	Qualifying Features	Potential for Ecological Connectivity Yes/No	Evaluation Rationale
Doire Donn SSSI	5.8km NNE	**Biological:** • Beetles; and • Chequered skipper butterfly (*Carterocephalus palaemon*)	No	**Not considered further** – Distances between the SSSI and the CFIIS development site are considered to be too great for general ranging by invertebrates. Thus, there is not considered to be any potential ecological connectivity between the CFIIS development site and the populations of invertebrates associated with qualifying features of the site.
		Biological: • Upland oak woodland	No	**Not considered further** – The habitat associated with the SAC is considered to be at a great distance from the proposed works, hence no potential ecological connectivity is expected.
Ardgour Pinewoods SSSI	6.6km NNW	**Biological:** • Beetles; • Chequered skipper butterfly; and • Reptile assemblage	No	**Not considered further** – Distances between the SSSI and the CFIIS development site are considered to be too great for general ranging by invertebrates or reptiles. Thus, there is not considered to be any potential ecological connectivity between the CFIIS development site and the populations of invertebrates or reptiles associated with qualifying features of the site.
		Biological: • Native pinewood (*Pinus* sp.)	No	**Not considered further** – The habitat associated with the SSSI is considered to be at a great distance from the proposed works, hence no potential ecological connectivity is expected.
Ardgour Pinewoods SAC	6.6km NW	• Alder (*Alnus* sp.) woodland on floodplains; and • Caledonian forest	No	**Not considered further** – The habitats associated with the SAC are considered to be at a great distance from the proposed works, hence no potential ecological connectivity is expected.
Carnach Wood SSSI	8.0km SE	**Biological:** • Flies	No	**Not considered further** – Distances between the SSSI and the CFIIS development site are considered to be too great for general ranging by invertebrates. Thus, there is not considered to be any potential ecological connectivity between the CFIIS development site and the populations of invertebrates associated with qualifying features of the site.

Designated Site	Approximate Distance and Direction from CFIIS Site	Qualifying Features	Potential for Ecological Connectivity Yes/No	Evaluation Rationale
		Biological: • Wet woodland	No	**Not considered further** – The habitat associated with the SSSI is considered to be at a great distance from the proposed works, hence no potential ecological connectivity is expected.
Glen Creran Woods SSSI	12.3km SE	**Biological:** • Bryophyte assemblage; • Lichen assemblage; and • Upland oak woodland	No	**Not considered further** – The habitats associated with the SSSI are considered to be at a great distance from the proposed works, hence no potential ecological connectivity is expected.
		Biological: • Chequered skipper butterfly; and • Pearl bordered fritillary butterfly (*Boloria euphrosyne*)	No	**Not considered further** – Distances between the SSSI and the CFIIS development site are considered to be too great for general ranging by invertebrates. Thus, there is not considered to be any potential ecological connectivity between the CFIIS development site and the populations of invertebrates associated with qualifying features of the site.
Glen Creran Woods SAC	12.3km SSE	**Biological:** • Mixed woodland on base-rich soils associated with rocky slopes; and • Western acidic oak woodland	No	**Not considered further** – The habitats associated with the SAC are considered to be at a great distance from the proposed works, hence no potential ecological connectivity is expected.
		Biological: • Otter (*Lutra lutra*).	No	**Not considered further** – In a coastal environment, otter generally range between 2 – 10km (Chanin, 2013). However, the SAC is situated approximately 12.3km from the CFIIS site, and it is likely that the distance that otter would have to travel would be much greater, to ensure that the species could stay within suitable habitats. Therefore, it is considered unlikely that otter associated with the SAC would frequent the area of the CFIIS site.

Designated Site	Approximate Distance and Direction from CFIIS Site	Qualifying Features	Potential for Ecological Connectivity Yes/No	Evaluation Rationale
Ben Nevis SSSI	12.4km ENE	**Biological:** • Breeding bird assemblage	Yes	**Considered further in Section 13: Terrestrial Ecology and Ornithology -** The SSSI does not qualify for the presence of a specific ornithological species, instead, it is designated for the presence of a breeding bird assemblage. Only two species are listed within the SSSI citation, snow bunting (*Plectrophenax Nivalis*) and dotterel (*Charadrius morinellus*). Neither species were identified during the breeding bird survey (BBS). However, there are records of snow bunting within the wider context of the development site (NBN Atlas, 2024). Thus, there is considered to be potential for wintering snow bunting to be present.
		Biological: • Bryophyte assemblage; • Native pinewood; • Upland assembly; • Upland oak woodland; • Vascular plant assemblage; and **Geological:** • Caledonian igneous	No	**Not considered further** – The habitats, plant assemblages and geological features associated with the SSSI are considered to be at a great distance from the proposed works, hence no potential ecological connectivity is expected.
		Biological: • Fly assemblage; and • Small mountain ringlet butterfly (*Erebia epiphron*)	No	**Not considered further** – Distances between the SSSI and the CFIIS development site are considered to be too great for general ranging by invertebrates. Thus, there is not considered to be any potential ecological connectivity between the CFIIS development site and the populations of invertebrates associated with qualifying features of the site.

Designated Site	Approximate Distance and Direction from CFIIS Site	Qualifying Features	Potential for Ecological Connectivity Yes/No	Evaluation Rationale
Sunart SSSI	14.9km WSW	**Biological:** • Bryophyte assemblage; • Eelgrass (*Zostera* sp.) beds; • Egg wrack (*Ascophyllum nodosum ecad mackaii*); • Lichen assemblage; • Rocky shore; • Saltmarsh; • Upland assemblage; • Upland oak woodland; • Vascular plant assemblage; and **Geological:** • Caledonian igneous; • Moine; and • Tertiary igneous	No	**Not considered further** – The habitats, plant assemblages and geological features associated with the SSSI are considered to be at a great distance from the proposed works, hence no potential ecological connectivity is expected.
		Biological: • Chequered skipper butterfly; • Dragonfly assemblage; and • Moths	No	**Not considered further** – Distances between the SSSI and the CFIIS development site are considered to be too great for general ranging by invertebrates. Thus, there is not considered to be any potential ecological connectivity between the CFIIS development site and the populations of invertebrates associated with qualifying features of the site.

Designated Site	Approximate Distance and Direction from CFIIS Site	Qualifying Features	Potential for Ecological Connectivity Yes/No	Evaluation Rationale
		Biological: • Otter	No	**Not considered further** – In a coastal environment, otter generally range between 2 – 10km (Chanin, 2013). However, the SSSI is situated approximately 14.9km from the CFIIS site, and it is likely that the distance that otter would have to travel would be much greater, to ensure that the species could stay within suitable habitats. Therefore, it is considered unlikely that otter associated with the SSSI would frequent the area of the CFIIS site.
Sunart SAC	16.0km WNW	**Biological:** • Dry heaths; • Mixed woodland on base-rich soils associated with rocky slopes; • Reefs; • Western acidic oak woodland; and • Wet heathland with cross-leaved heath (*Erica tetralix*)	No	**Not considered further** – The habitats associated with the SAC are considered to be at a great distance from the proposed works, hence no potential ecological connectivity is expected.
		Biological: • Otter	No	**Not considered further** – In a coastal environment, otter generally range between 2 – 10km (Chanin, 2013). However, the SAC is situated approximately 16.0km from the CFIIS site, and it is likely that the distance that otter would have to travel would be much greater, to ensure that the species could stay within suitable habitats. Therefore, it is considered unlikely that otter associated with the SAC would frequent the area of the CFIIS site.
Loch Shiel SSSI	17.8km NW	**Biological:** • Breeding black-throated diver (*Gavia arctica*)	No	**Not considered further** - Black-throated diver generally range <10km (SNH, 2016). Hence, no potential ecological connectivity is expected between the CFIIS site and the population of black-throated diver associated with the SSSI.

Designated Site	Approximate Distance and Direction from CFIIS Site	Qualifying Features	Potential for Ecological Connectivity Yes/No	Evaluation Rationale
		Biological: • Bryophyte assemblage; • Native pinewood; • Oligotrophic loch; and • Upland oak woodland	No	**Not considered further** – The habitats and plant assemblages associated with the SSSI are considered to be at a great distance from the proposed works, hence no potential ecological connectivity is expected.
		Biological: • Chequered skipper butterfly	No	**Not considered further** – Distances between the SSSI and the CFIIS development site are considered to be too great for general ranging by invertebrates. Thus, there is not considered to be any potential ecological connectivity between the CFIIS development site and the populations of invertebrates associated with qualifying features of the site.
Loch Creran MPA(NC)	18.3km SSW	**Biological:** • Flame shell (*Limaria hians*) beds; and **Geological:** • Quaternary of Scotland	No	**Not considered further** – The habitats and geological features associated with the MPA(NC) are considered to be at a great distance from the proposed works, hence no potential ecological connectivity is expected.
Loch Sunart to the Sound of Jura MPA(NC)	18.7km WSW	**Biological:** • Flapper skate (*Dipurtus intermedius*)	No	**Not considered further** – There are no known records of flapper skate within Loch Linnie (NBN Atlas, 2024). This suggests that the habitat within the loch is not suitable for the species. Therefore, in addition to the distance from the site, flapper skate associated with the Loch Sunart to the Sound of Jura MPA(NC) are not anticipated to be impacted by the CFIIS.
		Geological: • Quaternary of Scotland	No	**Not considered further** – The geological features associated with the MPA(NC) are considered to be at a great distance from the proposed works, hence no potential ecological connectivity is expected.

Designated Site	Approximate Distance and Direction from CFIIS Site	Qualifying Features	Potential for Ecological Connectivity Yes/No	Evaluation Rationale
Loch Etive Woods SAC	18.9km SE	• Alder woodland on floodplains; • Mixed woodland on base-rich soils associated with rocky slopes; and • Western acidic oak woodland	No	**Not considered further** – The habitats associated with the SAC are considered to be at a great distance from the proposed works, hence no potential ecological connectivity is expected.
		• Otter	No	**Not considered further** – In a coastal environment, otter generally range between 2 – 10km (Chanin, 2013). However, the SAC is situated approximately 18.9km from the CFIIS site, and it is likely that the distance that otter would have to travel would be much greater, to ensure that the species could stay within suitable habitats. Therefore, it is considered unlikely that otter associated with the SAC would frequent the area of the CFIIS site.
Eileanan Agus Sgeiran Lios Mór SAC	18.9km SW	• Harbour seal (*Phoca vitulina*)	Yes	**Considered further in Section 14.2: Marine Mammals -** The foraging trips of harbour seal typically range 50km (Lyons, 2004). As harbour seal would only need to travel approximately 19km within the marine environment to reach the location of the CFIIS, it is considered that harbour seal associated with the SAC may be present. Therefore, there is potential for the qualifying feature to be impacted.
Loch Shiel SPA	19.1km NW	**Breeding:** • Black-throated diver	No	**Not considered further** - Black-throated diver generally range <10km (SNH, 2016). Hence, no potential ecological connectivity is expected between the CFIIS site and the population of black-throated diver associated with the SSSI.

Designated Site	Approximate Distance and Direction from CFIIS Site	Qualifying Features	Potential for Ecological Connectivity Yes/No	Evaluation Rationale
Loch Moidart and Loch Shiel Woods SAC	19.7km NW	• Alder woodland on floodplains; • Intertidal mudflats and sandflats; • Mixed woodland on base-rich soils associated with rocky slopes; and • Western acidic oak woodland	No	**Not considered further** – The habitats associated with the SAC are considered to be at a great distance from the proposed works, hence no potential ecological connectivity is expected.
		• Otter	No	**Not considered further** – In a coastal environment, otter generally range between 2 – 10km (Chanin, 2013). However, the SAC is situated approximately 19.7km from the CFIIS site, and it is likely that the distance that otter would have to travel would be much greater, to ensure that the species could stay within suitable habitats. Therefore, it is considered unlikely that otter associated with the SAC would frequent the area of the CFIIS site.
Inner Hebrides and the Minches SAC	24.9km SW	• Harbour porpoise (*Phocoena phocoena*)	Yes	**Considered further in Section 14.2: Marine Mammals** – Harbour porpoise are a mobile feature which have been recorded travelling up to 100km in a straight line (Sveegaard, *et al.*, 2011). As harbour porpoise would only need to travel 25km within a marine environment in order to reach the Corran Narrows, and there are records of the species within Loch Linnhe (NBN Atlas, 2024), it would be justifiable to assume that harbour porpoise associated with the SAC may range within the vicinity of the CFIIS.

The majority of qualifying features of designated sites in proximity to the CFIIS are unlikely to be impacted by the scheme due to the distances involved and the localised nature of the likely impacts. However, potential ecological connectivity has been identified between the scheme and the ornithological qualifying interests/features of:

- Moidart and Ardgour SPA;
- Glen Etive and Glen Fyne SPA; and
- Ben Nevis SSSI.

In addition, potential ecological connectivity has been identified between the project and the qualifying interests/features of:

- Eileanan Agus Sgeiran Lios Mór SAC (with regard to harbour seal); and
- Inner Hebrides and the Minches SAC (with regard to harbour porpoise).

Potential impacts to these identified species are explored further in Section 13: Terrestrial Ecology and Ornithology and Section 14.2: Marine Mammals (as appropriate).

13 Terrestrial Ecology and Ornithology

This section considers all terrestrial ecological and ornithological receptors of the CFIIS, in terms of both habitats and potential species present on both sides of the Corran Narrows that could be affected by the CFIIS, during the construction or operational phase.

13.1 Baseline

Terrestrial ecological and ornithological baseline data of the area proposed for the CFIIS was collected during a Preliminary Ecological Appraisal (PEA) (Affric Limited, 2022) and Breeding Bird Survey (BBS) (Atmos Consulting, 2022), both completed in 2022, and a Protected Species Survey (PSS) in 2023 (Affric Limited, 2024). The surveys were comprised of a data collection exercise (desktop study) and appropriate site surveys.

The desktop studies provided additional context of the site, in regard to species, habitats and designated sites present locally. The desktop studies included a review of publicly available information from the National Biodiversity Network (NBN) Atlas to obtain records of previously identified species within the survey boundaries and wider locality (NBN Atlas, 2024). Information of local site designations was obtained from NatureScot's SiteLink (NatureScot, 2024). Furthermore, Google Maps and the Department for Environment, Food and Rural Affairs (DEFRA) MAGIC were assessed, to gain an understanding of potential habitat types which may be present (Google Maps, 2023 and DEFRA, 2023).

Surveys were undertaken to cover the development site with appropriate buffers for the species of interest (as shown in Drawing 99_DRG_14_1). It is noted that there have been alterations to the anticipated scoping boundary since the original surveys were undertaken. As a result, although survey data is available for the full scoping boundary, there are some gaps in information associated with specifies specific buffer zones. Further ecological survey works to capture ecological baseline data outside of the scoping boundary (where appropriate), will be undertaken as part of the EIA process (as stated in Section 13.4: Proposed Impact Assessment).

The purpose of each terrestrial ecological survey completed in support of the CFIIS is detailed in Table 13.1.1, along with which appendix they can be found in.

Table 13.1.1: Surveys Undertaken to Determine CFIIS Baseline

Document Title	Date Field Work Completed	Purpose	Appendix No.
Corran Ferry Infrastructure Improvement Scheme Preliminary Ecological Appraisal Report	August 2022	Desktop study and Extended Phase 1 Habitat Survey to identify habitats and determine the suitability of habitats for protected species.	Appendix 2
Corran Ferry Breeding Bird Survey Technical Report	April – June 2022	Identify the presence of bird species and determine the (where possible) location of birds' nests.	Appendix 3
Corran Ferry Infrastructure Improvement Scheme Protected Species Survey	May – August 2023	Identify potential for, and (where present) evidence of bats, badger, otter, pine marten and red squirrel.	Appendix 4

13.1.1 Designated Sites

Three ornithological qualifying interests/features associated with designated sites were identified to have potential ecological connectivity to the CFIIS site (see Table 12.2.1) and will be considered further within this section:

- Breeding bird assemblage associated with Ben Nevis SSSI;
- Breeding golden eagle associated with Glen Etive and Glen Fyne SPA; and
- Breeding golden eagle associated with Moidart and Ardgour SPA.

All of the features listed above will be considered further as 'ornithology'.

13.1.2 Habitats and Protected Species

An overview of the findings of the ecological surveys for each potential ecological receptors of the CFIIS is shown in Table 13.1.2. For further details, please refer to the relevant appended reports as per Table 13.1.1.

Table 13.1.2: Overview of Potential for Ecological Receptors within the Ecological Survey Boundaries

Receptor	Description
Habitats and protected plant species	Habitats within the Nether Lochaber scoping boundary were predominantly common within the wider locality (i.e. building, residential gardens, amenity grassland, coniferous woodland), however, broadleaved woodland situated towards the north of the Nether Lochaber scoping boundary was considered to have ecological value due to the presence of native bluebell (*Hyacinthoides non-scripta*) (Affric Limited, 2024). Furthermore, small areas of coastal habitat were considered to have ecological value due to their potential usage by otter (Affric Limited, 2022; Affric Limited, 2024). Much of the existing natural habitat within Nether Lochaber has been degraded due to extensive rhododendron scrub (Affric Limited, 2022). Habitats within the Ardgour scoping boundary were considered to be relatively common within the wider locality (i.e. buildings, residential gardens and amenity grassland) (Affric Limited, 2022).
Amphibians and reptiles (collectively referred to as 'herptiles')	Records of amphibians and reptiles (collectively referred to as 'herptiles') were identified within 2km of the Nether Lochaber and Ardgour scoping boundary, including common toad (*Bufo bufo*), common frog (*Rana temporaria*) and slow worm (*Anguis fragilis*) (Affric Limited, 2022). These species are generally considered to be common and widespread within the wider locality. No herptiles were identified during the PEA survey, however, woodland, scrub, amenity grassland and connected residential gardens were considered to provide suitable habitat within the Nether Lochaber scoping boundary (Affric Limited, 2022). Furthermore, two potential hibernacula were identified in the broadleaved woodland within the Nether Lochaber scoping boundary (Affric Limited, 2024). Scrub, amenity grassland, open grassland and connected residential gardens was considered to provide suitable habitat within the Ardgour scoping boundary (Affric Limited, 2022). Available habitat in Nether Lochaber (i.e., Corran) and Ardgour was considered to be sub-optimal for herptiles due to the general lack of connectivity as a result of urban developments, such as highways and buildings. However, it is considered probable that common and widespread herptile species are present within the identified suitable habitats in low numbers.
Badger	No records of badger were identified within 2km of the Ardgour scoping boundary, however, records of badger were identified within 2km of the Nether Lochaber scoping boundary. No evidence of badger was identified within either the Nether Lochaber or Ardgour badger scoping boundaries or 100m buffer zones. However, suitable habitat for sett building and foraging/commuting was identified within both the Nether Lochaber and Ardgour scoping boundaries (Affric Limited, 2024). As badger are a highly mobile species, there is potential for badger to roam within the scoping boundaries from territories outside of surveyed land, hence, the presence of foraging/commuting badger therefore cannot be discounted.

Receptor	Description
Roosting bats	No records of bat species were identified within 2km of either the Nether Lochaber or Ardgour scoping boundaries and no evidence of roosting bats was identified within the Nether Lochaber or Ardgour bats scoping boundaries. However, the Nether Lochaber and Ardgour scoping boundaries lie within the known national range of five bat species, including common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Daubenton's bat (*Myotis daubentonii*), natterer's bat (*Myotis nattereri*) and brown long-eared bat (*Plecotus auritus*). Individual Potential Roosting Features (PRF-I) (as described in Collins, 2023) were identified within the broadleaved trees situated within the Nether Lochaber bat scoping boundary and in the 'lighthouse store' situated just outside of the Ardgour scoping boundary (Affric Limited, 2024). Additional survey works will be required to confirm the presence, or likely absence, of roosting bats.
Foraging/commuting bats	As outlined above, no records of bat species were identified within 2km of the Nether Lochaber or Ardgour scoping boundaries, although the Nether Lochaber and Ardgour scoping boundaries lie within the known national range of five bat species. No evidence of bats was identified within either the Nether Lochaber or Ardgour scoping boundaries. However, suitable foraging/commuting habitat was identified within both the Nether Lochaber and Ardgour. In particular, woodland, residential gardens and coastal habitats in the Nether Lochaber scoping boundary were considered to be of high suitability for foraging/commuting bats, and residential gardens, coastal habitats, and open woodland in the Ardgour scoping boundary were considered to be of moderate suitability for foraging/commuting bats (Affric Limited, 2024). Ultimately, it is anticipated that foraging/commuting bats are likely to be present within both the Nether Lochaber and Ardgour, however additional survey works will be required to determine the species and likely abundance.
Invertebrates	There are no known records of protected invertebrate species within the Nether Lochaber or Ardgour scoping boundaries. Furthermore, no protected invertebrate species were identified during the PEA site survey (Affric Limited, 2022). Local habitats are anticipated to support populations of common and widespread invertebrate species.

Receptor	Description
Otter	There are records of otter within the Nether Lochaber and Ardgour scoping boundaries (Affric, 2024). Locals have reported otter sightings within Loch Linnhe, between the two land parcels. Otter spraints were identified within the coastal margins in Nether Lochaber and Ardgour, confirming the presence of the species (Affric, 2024). In addition, one potential holt was identified just south of the Ardgour scoping boundary (Affric, 2024), one potential otter layup was identified within the Nether Lochaber scoping boundary and another potential otter layups was identified within the Ardgour scoping boundary (Affric Limited, 2024). Additional survey works will be required to confirm whether the holts and layups are actively used by otter, and whether any of the holts are utilised for breeding.
Pine marten	A former pine marten den was confirmed within a residential outbuilding situated towards the southwest of the Nether Lochaber scoping boundary (Affric, 2024). In addition, suitable habitat for pine marten was identified within the broadleaved woodland situated within Nether Lochaber (Affric, 2024). Although no evidence of pine marten was identified, several potential den sites were recorded (Affric, 2024). The woodland is relatively disconnected from high-quality habitat within the wider locality however, records of deceased pine marten on the A82 suggest the species do make attempts to commute between woodland on either side of the A82, therefore there is considered to be ecological connectivity between identified records of the species and the broadleaved woodland in the Nether Lochaber area (Affric Limited, 2024). It should be assumed that foraging/commuting pine marten may utilise woodland habitats within the Nether Lochaber on an opportunistic basis, although additional survey works will be required to confirm whether the potential den sites are in-used by pine marten. No records of pine marten were identified within 2km of the Ardgour pine marten scoping boundary. Habitats were considered to be sub-optimal for the species, hence, the likelihood of pine marten to be present within the Ardgour scoping boundary is considered to be low (Affric Limited, 2024).

Receptor	Description
Red squirrel	Suitable habitat for red squirrel was identified within the broadleaved and coniferous woodland situated within Nether Lochaber (Affric, 2024). No evidence of red squirrel was identified during the PSS, however records of deceased red squirrel on the A82 suggest the species do make attempts to commute between woodland on either side of the A82 (Affric, 2024). There is therefore considered to be ecological connectivity between identified records of the species and the patches of broadleaved woodland in the Nether Lochaber area. It should be assumed that foraging/commuting red squirrel may utilise woodland habitats within Nether Lochaber on an opportunistic basis (Affric Limited, 2024). Records of red squirrel were identified within the Ardgour scoping boundary (Affric, 2024). Although no evidence of the species was identified during the PSS, suitable habitats, including residential gardens and patches of broadleaved and coniferous trees were present (Affric, 2024). Thus, it should be assumed that foraging/commuting red squirrel may be present within gardens and trees within Ardgour on an opportunistic basis.
Other terrestrial mammals	It is expected that the habitats within Nether Lochaber and Ardgour are suitable for populations of widespread mammal species, including hedgehog (*Erinaceus europaeus*) (a UK BAP species).
Ornithology	Overall, forty-two bird species were recorded during the BBS, although only one confirmed nest was recorded, which was identified as black guillemot (*Cepphus grylle*). Thirty-one of the identified bird species were recorded as 'probably' and/or 'possibly' breeding within the BBS area (Atmos Consulting, 2022). Species of note include herring gull (*Larus argentatus*), house sparrow (*Passer domesticus*), siskin (Spinus spinus), spotted flycatcher (*Muscicapa striata*), starling (*Sturnus vulgaris*) and wren (*Troglodytes troglodytes*), which are all listed on the Scottish Biodiversity List. Three non-breeding Annex I bird species were identified during the BBS, including arctic tern (*Sterna paradisaea*), common tern (*Sterna hirundo*), and osprey (*Pandion haliaetus*) (osprey is also a Schedule 1 species of the WCA) (Atmos Consulting, 2022). In addition, it is worth noting that the CFIIS lies within 6km (the core range of golden eagle) of both the Glen Etive and Glen Fyne SPA and Moidart and Ardgour SPA (both designated for the presence of breeding golden eagle), hence, there is considered to be potential for foraging/commuting golden eagle within locality of the CFIIS site. Additionally, non-breeding snow bunting (which are associated with the breeding bird assemblage of the Ben Nevis SSSI) may also range within the locality of the CFIIS site (see Table 12.2.1).

The data collected to inform the terrestrial ecological and ornithological baseline provides evidence that there are habitats of value, including habitats capable of supporting protected species, within the CFIIS site. Hence, potential impacts to habitats and protected species due to the proposed works are considered further in Section 13.2: Potential Impacts.

13.1.3 Invasive Non-native Species

A stand of Japanese knotweed (*Reynoutria japonica*) was identified within the broadleaved woodland in the Nether Lochaber scoping boundary and rhododendron (*Rhododendron ponticum*) was identified throughout several different habitat types within the Nether Lochaber and Ardgour scoping boundaries (Affric Limited, 2022). In addition, Spanish bluebell (*Hyacinthoides hispanica*) and hybrid bluebell species (*Hyacinthoides x massartiana*) were identified within a patch of predominantly native bluebell within the broadleaved woodland in Nether Lochaber (Affric Limited, 2024).

These species are all invasive non-native species (INNS) which can spread rapidly. Rhododendron can substantially degrade, or entirely alter, habitat types and cause a loss of biodiversity. Japanese knotweed can negatively impact upon infrastructure, due to its ability to grow through concrete and other hard surfaces. Spanish bluebell is able to outcompete native bluebell for resources, such as light and space, resulting in a decline in native bluebell. In addition, Spanish bluebell are able to hybridise with native bluebell, which results in a change in the genetics of native populations, which could result in the loss of the species as it is known today. These INNS all have negative value to the wider locality. Increased activity within areas containing INNS has the potential to result in accidental spread, thus, the presence of INNS is considered further in Section 13.2: Potential Impacts.

13.2 Potential Impacts

Water is an important resource for all terrestrial ecological receptors and changes in water quality can impact on flora and fauna. There is only one freshwater course within the vicinity of the works. In addition, works will be undertaken within and adjacent to Loch Linnhe (a marine loch).

As discussed in Section 10: Water Quality, no impacts are expected to the quality of freshwater systems, and any adverse changes in water quality within the freshwater environment are highly unlikely, especially when considering the mitigation that will be implemented throughout the construction phase.

Some terrestrial and ornithological species, such as otter, seabirds and divers may venture into marine habitats as part of their lifecycle, for example commuting and foraging. Therefore, changes in marine water quality could have knock on implications for these receptors. Potential impacts to water quality within the marine environment are discussed in Section 10: Water Quality impacts include increased solids in the water column and pollution. In theory, increased turbidity caused by changes in solids within the marine water column could affect underwater foraging. However, as discussed in Section 10.3.1.1 and 10.3.2.1, increases in solids in the water column are expected to be very localised and short lived, hence with mitigation, impacts on terrestrial and ornithological receptors are highly unlikely. Pollution within the marine environment could directly affect terrestrial and ornithological species if they were to come into contact with it, or indirectly if it were to impact their prey species. However, as discussed in Section 10.3.1.2 and 10.3.2.2, there are limited sources of pollution and sufficient mitigation to minimise the risks of changes to water quality have been identified in other Sections. Thus, the risks to terrestrial ecology receptors are minimal.

Similarly changes to soil could impact upon terrestrial ecological receptors due to changes in structure or nutrient availability, these affects are considered in Section 9: Geology, Land and Soils.

As such impacts on terrestrial ecological receptors due to changes in water or soil quality are not considered in this section.

13.2.1 Potential Impacts Due to Construction

13.2.1.1 Habitat Changes

Habitat loss is expected to occur on both sides of the Corran Narrows, with the most extensive habitat loss being associated with the removal of a woodland block situated towards the north of the Nether Lochaber side scoping boundaries. The woodland has potential to support a range of species, including native bluebell, herptiles, bats, badger, hedgehog, red squirrel, pine marten and birds, due to the availability of PRFs, suitable hibernacula, suitable features for dens and suitable habitat for drey, sett and nest building. Additionally, it is expected that an area of coastal habitat will be lost or degraded due to the construction of infrastructure along the coastline, which may result in a reduction of local habitat for otter.

Habitat loss could result in a long-term spatial distribution of individuals within the CFIIS site, although changes in distribution are anticipated to be localised and there is considered to be other habitats within the locality of the CFIIS site that are more suited to the notable terrestrial ecological receptors. As discussed in Section 12.1.2.1 NPF4 Policy 3 requires the project to achieve biodiversity enhancement. To this end, works are ongoing to identify opportunities to develop habitats within the local area. Priority will be given to ensuring that any habitats created are appropriate to support local important flora and fauna, in alignment with the Highland Nature Biodiversity Action Plan (Highland Nature, 2021).

13.2.1.2 Habitat Degradation

As discussed above, no significant impacts to water quality or soil quality are expected, providing the appropriate mitigation measures are implemented (see Section 10: Water Quality and Section 9: Geology, Land and Soils, respectively). However, there may still be potential for habitat degradation due to lighting and mechanical damage to vegetation.

Lighting has various behavioural effects on different species, therefore it is anticipated that there could be temporary alterations to how some species utilise habitats impacted by increased artificial light (if required during the construction works), and therefore some level of habitat degradation could occur.

Mechanical damage to vegetation associated with habitats that are to be retained (i.e. outwith the proposed footprint), could be damaged during construction works. In some instances, mechanical damage can cause permanent or temporary degradation of habitats.

Although mitigation can be readily implemented to minimise effect of habitat degradation, the specification of the mitigation needs to take into account the specific construction works and phasing.

13.2.1.3 Spread of Invasive Non-native Species

Rhododendron, Japanese knotweed and Spanish and hybrid bluebell species are present within the Nether Lochaber side scoping boundary. Construction activity within effected areas has the potential to cause accidental spread of INNS and the introduction of INNS to new locations. In the absence of mitigation, the spread of INNS has the potential to result is

extensive habitat loss or degradation (in relation to rhododendron and Japanese knotweed), loss of native bluebell and hybridisation (in relation to Spanish and hybrid bluebell species).

13.2.1.4 Disturbance

Many fauna species are particularly sensitive to disturbance and may actively avoid habitats within the areas of increased visual and audio disturbance. This includes habitats within the vicinity of construction activity, with disturbance distances varying between species. The proposed construction activity will result in a temporary increase in visual and audio disturbance throughout the completion of the works through the presence of workers, plant and equipment. As fauna are likely to avoid areas associated with disturbance, there could be temporary spatial alterations in species distributions in retained habitats within the locality of the CFIIS site. Additionally, disturbance has potential to have greater effects on immobile important ecological features (IEFs), as species may be unable to relocate during sensitive periods in the life cycle.

13.2.1.5 Accidental Physical Injury

The completion of construction works within environments in which fauna may be present has the potential to increase the risk of accidental physical injury, due to increased traffic and footfall, increased usage of materials and machinery and accidental entrapment. With the implementation of appropriate mitigation, the risk of accidental physical injury is expected to be minimised. Standard construction site mitigation will prevent significant effects.

13.2.2 Potential Impacts Due to Operations

13.2.2.1 Habitat Change

Habitat change is expected due to the need to ensure compliance with Policy 3 of NPF4 (see Section 12.1.2.1: NPF4). Due to anticipated time periods required to appropriately establish new habitats, it is expected that habitat change will be ongoing throughout the operational stage. The assessment of habitat change will incorporate considerations to connectivity of habitats throughout the scoping and boundary and within the wider locality.

13.2.2.2 Disturbance

Once operational, the CFIIS will result in spatial alteration to certain activities associated with the Corran Ferry service, hence, disturbance to protected fauna may occur in new areas in the form of visual disturbance and/or from the generation of noise. Fauna may avoid areas affected by disturbance, which may alter their spatial distribution within the CFIIS location and surrounding habitats long-term. The significance of the effect will be determined by the presence of IEFs, as otter and potentially bats and pine marten are utilising the area, then disturbance effects cannot be ruled out at this stage.

13.2.2.3 Accidental Physical Injury

Accidental physical injury associated with operations is expected to be predominantly linked to the potential for road traffic collisions. However, this is not anticipated to exceed that already associated with the existing ferry service on the Ardgour side. The change in location of the slipway on the Nether Lochaber side will change the potential species interacting with traffic.

13.3 Mitigation

Due to the timeframes associated with the successful treatment of Japanese knotweed, and need to prevent the accidental spread, a Japanese knotweed eradication plan is currently being developed and will be implemented at earliest opportunity. This will minimise risk of further spread and prevent delays to construction works.

13.4 Proposed Impact Assessment

It is acknowledged that there are currently gaps in the baseline for terrestrial ecology, and therefore, further survey works will be required to gain understanding of how impacts associated with construction and operations might affect terrestrial ecological receptors. Therefore, impacts to protected fauna and flora associated with construction and operations will be **scoped in** to the EIA as detailed in Table 13.4.1.

Table 13.4.1: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Habitat Change	In	In
Habitat Degradation	In	NA
Spread of INNS	In	NA
Disturbance	In	In
Accidental physical injury	In	In

NA = Not applicable.

The following additional terrestrial ecological survey works are proposed to inform the EIAR. The surveys will be carried out as per species-specific best practice guidance at the time of survey and will include the scoping boundary and any suitable habitats within species-appropriate buffer zones:

- Appropriate bat surveys;
- Monitoring of features suitable for pine marten dens;
- Monitoring of features suitable for otter holts, couches and layups;
- Baseline condition assessment of habitats within the CFIIS site; and
- INNS survey

The more detailed baseline will be utilised to inform an Ecological Impact Assessment, which will be carried out in alignment with CIEEM's Guidelines for Ecological Impact Assessment (CIEEM, 2018).

With regard to biodiversity enhancement, the methodologies to be utilised in Scotland are still under development, it is however, anticipated that a biodiversity metric will aid in demonstrating that enhancement is achievable.

As Japanese knotweed is growing on the land, there is a legal responsibility to control the INNS and prevent it from spreading. Hence, the development of the Japanese knotweed

eradication plan discussed in Section 13.3: Mitigation. A full INNS management plan will be developed and presented in the EIAR to detail how accidental spread of INNS will be avoided.

14 Marine Ecology

This section considers relevant, describes the baseline conditions for each specific topic and assesses the potential impacts on marine ecology associated with the CFIIS. The assessment to decide whether topics including benthic ecology, marine mammals and fish and shellfish should be scoped in or out of the EIA is based on the potential impacts arising from the design elements, construction techniques and operational activities of the proposed CFIIS (see Section 3: Characteristics of Development).

Similar to discussion on Terrestrial Ecology and Ornithology (see Section 13.2) changes in marine water quality could have knock on implications for marine ecology receptors. Potential impacts to water quality within the marine environment are discussed in Section 10: Water Quality. Pollution within the marine environment could directly affect benthic, fish, shellfish and marine species if they were to come into contact with it, or indirectly if, it was to impact their prey species. However, as discussed in Section 10.3.1.2 and 10.3.2.2, there are limited sources of pollution and sufficient mitigation to minimise the risks of changes to water quality have been identified in other Sections. Thus, the risks to marine ecology receptors are minimal and therefore do not warrant specifically considered within this section.

As discussed in Section 10.3.1.1 there are both on and offshore sources of solids which could enter the water column which can in turn give rise to sedimentation. Onshore sources can be avoided by mitigation as detailed in Section 10.6 and hence will not be considered further. Offshore sources of solids primarily due to dredging are likely to be limited, and effects localised however, effects on marine ecology cannot be entirely ruled out. Therefore, sedimentation effects are considered in benthic ecology (Section 14.1.3.2 & 14.1.3.2) and dredging effects are considered with for marine mammals (Section 14.2.3.3 & 14.2.3.3) and fish and shellfish (Section 14.3.3.4 & 14.3.4.3).

14.1 Benthic Ecology

14.1.1 Data and Information Sources

In order to conduct the baseline study, several sources of information were examined. These include the NBN Atlas (NBN Atlas, 2024), the European Marine Observation and Data Network (EMODnet), the Marine Life Information Network (MarLIN), the Joint Nature Conservation Committee (JNCC), the World Register of Marine Species (WoRMS) and survey data from NatureScot. A review of available scientific literature and Seasearch dive records was also conducted.

A benthic survey has been carried out across the development area between the 19th and 21st of November 2023 by OceanEcology and provided photographic and video footage of sampled transects and data from grab samples. Benthic surveys also aimed to ground truth the extent and location of any identified sensitive benthic habitats or benthic habitats of particular biodiversity value in the Corran Narrows (e.g. kelp).

14.1.2 Baseline

14.1.2.1 Desk Study

The Corran Narrows is a highly energetic tidal stream environment within Loch Linnhe, located in a narrow channel between the areas of Corran and Ardgour. The fast currents that run through the narrows dictate the environmental conditions of the seafloor and subsequently the benthic biotopes and species that are present. As such, within the Corran Narrows the representative biotope was identified from a 2013 study as '*Alcyonium digitatum* with dense *Tubularia indivisa* and anemones on strongly tide-swept circalittoral rock' (CR.HCR.FaT.CTub.Adig), associated with coarse gravel, cobbles and small boulders and dense cover of dead man's finger (*A. digitatum*), sea anemones (*Urticina sp.*), encrusting serpulids (*Spirobranchus sp.*) and the clonal plumose anemone (*Metridium senile*; Nickell *et al.*, 2013). It is worth noting that only one video transect was conducted by Nickell *et al.* (2013) to determine this biotope, and it is possible other species may have been present in the area. Strong currents usually facilitate the presence of other filter feeding species in this biotope, including jewel anemones (*Corynactis viridis*) and sponges (Stamp and Williams, 2021).

During field visits to the CFIIS location, kelp was identified growing on and nearby the Corran and Ardgour slipways. The species and extent of this kelp is currently unknown, however, kelp beds are listed as a PMF due to their importance to other species in providing food and shelter and their role in recycling nutrients within the marine environment. It can be noted that in the aforementioned CR.HCR.FaT.CTub.Adig biotope, the presence of cuvie (*Laminaria hyperborea*) is common in the upper infralittoral region (JNCC, 2022). This kelp species can grow to 3.5 m in length and is often covered in various epifaunal and floral species (Tyler-Walters, 2007).

In addition, a seagrass (*Zostera sp.*) bed has recently been discovered approximately 1 km northwest from the proposed development (Project Seagrass, 2023). Seagrass beds are designated PMFs, UK BAP features and OSPAR designated threatened and declining habitats. The seagrass bed has been preliminarily mapped, however surveys to determine full extent, health and other metrics have not yet been conducted.

In terms of freedom from invasive marine species, SEPA classifies Loch Linnhe North and Loch Linnhe South as having 'high' and 'good' status respectively (SEPA, 2015).

14.1.2.2 Benthic Survey

The benthic survey included photographic and video footage from Drop Down Camera (DDC) transects and four kelp transects allowing for ground truthing across the potential development footprint and surrounding area as shown in Figure 14.1.2. The kelp transects were proposed in order to ground truth areas of kelp identified during field visits to the CFIIS location, as described in Section 14.1.2.1. The benthic survey resulted in the collection of 415 still images and 27 videos which were analysed to identify the Broad Scale Habitat (BSH) and biotopes across the survey area. Images were then further assessed to inform on the distribution and extent of any protected and/or sensitive habitats and species (e.g. Annex 1 reef features/PMFs). It should be noted that three Scottish and Southern Energy (SSE) seabed power cables in the area, as shown in Figure 14.1.2, meant that there were some survey limitations due to a 50m exclusion zone on either side of the one energised sub-sea cable and a 15m exclusion zone either side of the two de-energised sub-sea cables. Full details of the benthic survey and drawings can be found in the OceanEcology, 'Corran Ferry Ground Investigation Surveys: Technical Report' in Appendix 5.

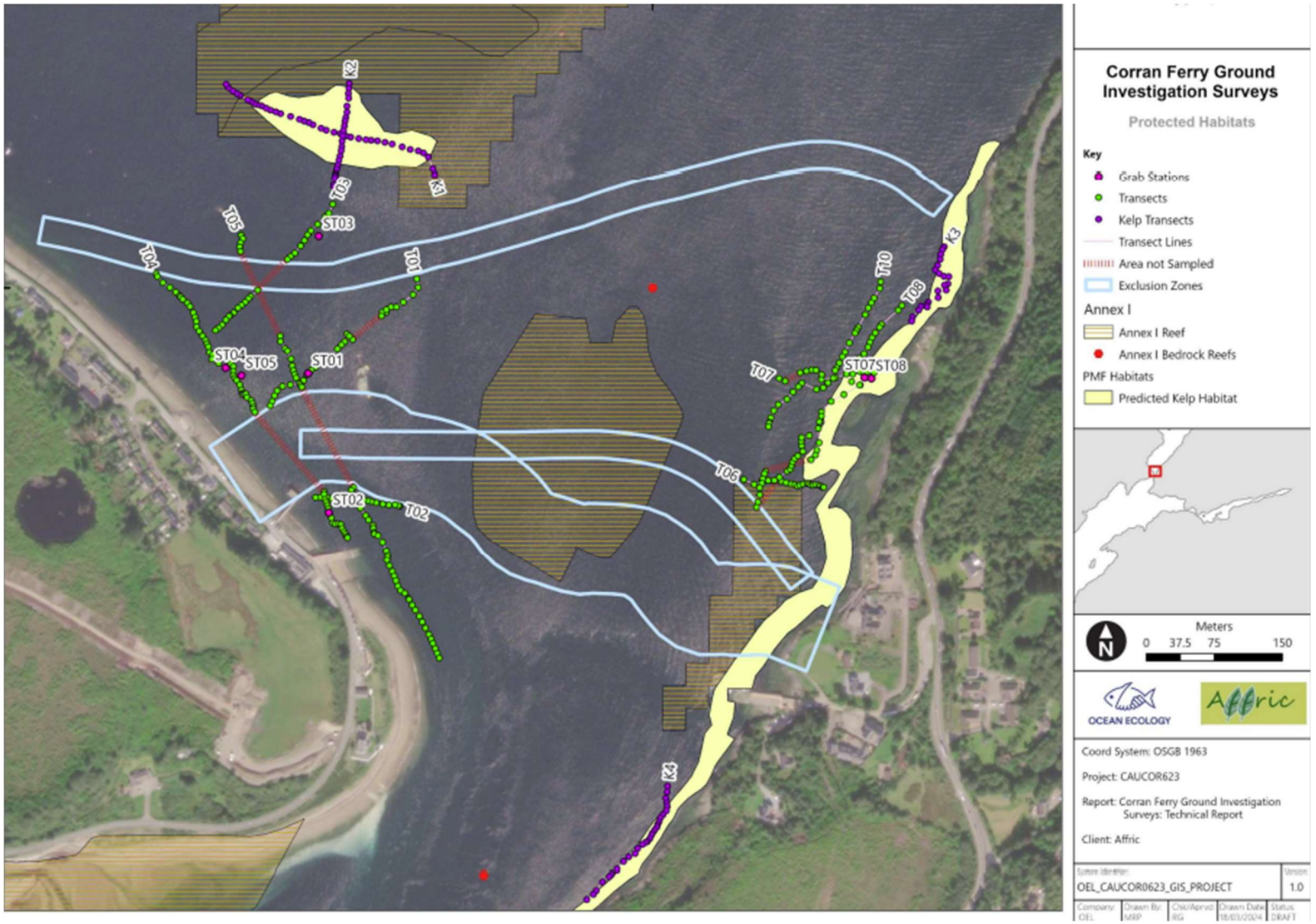

Figure 14.1.2: Survey Design including Kelp Transects and Grab Sampling Stations and PMF and Annex 1 Habitats Occurring within and in the Vicinity of the Survey Area (OceanEcology, 2024)

A total of eight BSHs, four EUNIS (European Union Nature Information System) Level 4, thirteen EUNIS Level 5, and six EUNIS Level 6 were identified in the seabed imagery collected. The dominant BSH identified was A5.5, characterised as 'subtidal macrophyte dominated sediment.' This classification was identified at six of the DDC transects, and within three of the kelp transects. The most frequently identified EUNIS biotope across these transects was A5.521, described as '*laminaria saccharina* and red seaweeds on infralittoral sediments' which includes the PMF habitat, 'kelp and seaweed communities on sublittoral sediment.' The second dominant BSH observed was A5.4 'subtidal mixed sediment.' This was identified at six DDC transects and on one of the kelp transects within the survey area. The most commonly identified EUNIS habitat at these transects was A5.43 'Infralittoral mixed sediments.'

The most common epifauna and macroalgae observed in the seabed imagery for the DDC transects included tube worms *Serpulidae*, macroalage including reds (Calcareous), and browns (*Laminaria sp.* and *Saccharina latissima*) and the bryozoan *Electra Pilosa*. This was similar for the kelp transects.

An assessment of Annex 1 reef habitat was also carried out through assessing the collected imagery. Annex 1 reef was observed within 111 of the transect images throughout the survey area.

The PMF habitats 'kelp beds' and 'kelp and seaweed communities on sublittoral sediment' were identified within 52 and 137 images respectively. The biotope A3.322 '*Laminaria saccharina* and *Psammechinus miliaris* on variable salinity grazed infralittoral rock' was identified in three images on Transect T01 and was the biotope component of PMF habitat 'low or variable salinity habitats.' The biotopes A3.222 'mixed kelp and red seaweeds on infralittoral boulders, cobbles and gravel in tidal rapids,' and A3.126 '*Halidrys siliquosa* and mixed kelps on tide-swept infralittoral rock with coarse sediment' were identified in 12 images from two transects (T02 and T04) and were the biotope components of the PMF habitat 'tide-swept algal communities.'

In addition to video transects, seven sediment samples were taken and analysed for full particle size classification. Sediment was heterogeneous across the survey area, characterised by contributions of sand and gravel at all stations with mud present in minimal quantities. Four of the seven stations sampled were representative of EUNIS BSH A5.4 (Mixed Sediment) and all of which were classified by the textural group Muddy Sandy Gravel (msG). The other three stations were representative of EUNIS BSH A5.1 (Coarse Sediment) and included the textural groups Gravelly Sand (gS) and Sandy Gravel (sG).

Two species classified as invasive and non-native species were identified during the survey: the arthropod *Crassicorophium crassicorne* and the mollusc *Mya arenaria*. *C. crassicorne* was recorded on three occasions across two stations (ST02 and ST03) and two *M. arenaria* individuals were recorded at ST03.

14.1.3 Potential Construction Effects

During the construction of the CFIIS, several possible impacts from construction activities on benthic ecological receptors have been identified:

- Habitat changes
- Sedimentation; and
- Introduction of marine Invasive Non-Native Species (INNS).

14.1.3.1 Habitat Changes

The CFIIS will involve removal of area of seabed, temporarily and permanently. Land reclamation and construction of permanent infrastructure will result in certain permanent loss of benthic habitat. Dredging and rock stripping (and potentially blasting) will also include habitat loss, but this would be expected to be temporary. The removal of seabed will result in displacement and destruction of sessile species which are present.

As noted in Section 14.1.2, the EUNIS biotope was A5.521 which includes the PMF habitat, 'kelp and seaweed communities on sublittoral sediment' was identified frequently within the kelp transects along with Annex 1 reef habitat identified within many of the transect images. The significance of habitat change to these biotopes and other noted habitats as a result of the CFIIS needs to be further understood.

A seagrass bed was identified to the north of the proposed CFIIS however, there are no development plans in this area or in close proximity and it will therefore not be considered further.

14.1.3.2 Sedimentation

In addition to dredging removing areas of habitat, there is a potential for seabed materials to drop back to the seafloor. Sedimentation can produce smothering effects to benthic organisms and habitat depending on their resilience (Miller *et al.*, 2002). The attenuation of light as a result of sedimentation can prevent photosynthetic benthic flora from obtaining energy (Pineda *et al.*, 2016). The effect of this on benthic habitats identified within the dredge and reclamation areas are not considered as they will be lost at least temporarily as discussed in Section 14.1.3.1. However surrounding habitat may be impacted by sedimentation.

As outlined in Section 11.2.1: Seabed, the material to be dredged comprises largely coarse sands and gravels with some cobbles and silty sands on the Ardgour side, and predominantly bedrock on the Nether Lochaber side. The predominantly coarse nature of the seabed means that any material suspended in the water column would likely drop out of suspension quickly, however, due to the high energy water currents through the narrows (as discussed in Section 11.2.2) it is likely that sedimentation will affect benthic habitats adjacent to the dredge areas.

14.1.3.3 Spread of Marine Invasive Non-Native Species

An INNS is defined as a species that is non-native to the ecosystem under consideration and whose introduction may cause economic or environmental harm. Invasive species can be introduced to an area by ship ballast water or biofouling. The risk of non-native species colonisation on hard surfaces may be dependent on the material (e.g., metal, concrete). While introduction of non-native species is often detrimental to natural biotopes, their establishment is dependent on optimal environmental conditions. The high-energy tidal stream environment of the Corran Narrows is a specialised habitat where only specifically adapted species may survive, lessening the chance of marine INNS establishment. However, there is potential for structures in more sheltered areas to be colonised by marine INNS.

All vessels associated with CFIIS construction will be contracted from countries adhering to the International Maritime Organisation (IMO) Convention and MARPOL compliant. Only vessels adhering to the IMO 2011 Guidelines for the Control and Management of Ships' Biofouling to Minimise the Transfer of Invasive Species will be used in line with Highland Council policy. This embedded mitigation will act to minimise the risk of introduction of INNS. However, as noted

in Section 14.1.2, INNS have been identified in the development area and mitigation measures will need to be assessed with the specific species in mind, taking account of construction activities including for example vessel movements associated with deliveries.

14.1.4 Potential Operational Effects

During the construction of the CFIIS, several possible impacts from the operational phase activities on benthic ecological receptors have been identified:

- Habitats Changes
- Sedimentation; and
- Introduction of marine Invasive Non-Native Species (INNS).

14.1.4.1 Habitat Changes

Habitat changes associated with operations are due to the presence of the new infrastructure and may occur if maintenance dredges are required.

The permanent infrastructure associated with the operational CFIIS may modify the existing benthic habitat by creating additional surfaces which could be colonised by marine species. Rock armour, piles, slipways, and other submerged surfaces will become colonised over time and can have a positive impact on the overall biodiversity of the area. It is unclear to what extent this may occur at the CFIIS, however, it is likely it will depend on the species and habitats present and would not have a significant detrimental effect on the existing habitat and species.

The habitat may also be modified during the operational phase through sediment removal associated with maintenance dredging (if required) to maintain water depth for the vessels. As in the construction phase, removal of sediment (and habitat) would have a negative but highly localised effect on habitats and species.

The construction of inter- and sub-tidal infrastructure may change the hydrodynamics of the area, and subsequently impact the benthic habitats present in localised areas. Hydrodynamic modelling of the current movement expected post-construction will allow for a better understanding of the potential impacts (refer Section 11: Seabed, Coastal Processes and Flooding).

14.1.4.2 Sedimentation

During infrequent maintenance dredges (if required) sedimentation effects could occur in the same way they would during the initial capital dredge, see Section 14.1.3.2. It is expected that maintenance dredging (if required) would be highly localised, though further consideration will be required as to the significance of the impacts on benthic ecology including protected features, as noted in Section 14.1.3.2.

14.1.4.3 Spread of Marine Invasive Non-Native Species

As noted in Section 14.1.2, the presence of INNS has been recorded in the development area. As discussed in Section 14.1.3.3, INNS can be introduced to an area by ship ballast water and biofouling. The infrastructure has the ability to support additional vessels and therefore there is the risk of the introduction of INNS, or spread of INNS from Corran elsewhere when vessels are for example sent away from maintenance.

Only vessels adhering to the IMO 2011 Guidelines for the Control and Management of Ships' Biofouling will be utilised on the Corran Ferry crossing. This embedded mitigation will act to

minimise the risk of spread of INNS. However, as noted in Section 14.1.2, it is prudent to specifically consider the INNS species identified during the initial survey works (see Section 14.1.2.2.

14.1.5 Proposed Impact Assessment

It is proposed that habitat changes, sedimentation and the spread of marine INNS are **scoped in** for both the construction and operational phases of the CFIIS. A summary of effects scoped in is outlined in Table 14.1.5.

The impact assessment will be informed by the site-specific benthic surveys which have already been carried out. These surveys included benthic video transects and grab sampling for benthic analysis, with methodology developed in consideration of the draft guidance, 'Guidance on Survey and Monitoring in Relation to Marine Renewables Deployments in Scotland Volume 5: Benthic Habitats' (Saunders *et al.*, 2011) (see Appendix 5 for full details). An intertidal survey is proposed to provide additional detail to inform habitat mapping.

The impact assessment will utilise the habitat maps, which will be developed from extrapolating data from the desk study, benthic and intertidal survey transects and grab samples. With regard to the spread of Marine INNS, it is proposed that a site specific Biosecurity Management Plan is developed and presented as an Appendix to the EIAR.

Table 14.1.5: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Habitat Changes	In	In
Sedimentation	In	In
Spread of Marine INNS	In	In

14.2 Marine Mammals

14.2.1 Data and Information Sources

In order to conduct the baseline study, several sources of information were examined. These include the NBN Atlas (NBN Atlas, 2024), the Hebridean Whale and Dolphin Trust (HWDT) WhaleTrack app (HWDT, 2024), and the Special Committee on Seals (SCOS) (SCOS, 2021). A review through available scientific literature was also conducted.

14.2.2 Baseline

14.2.2.1 Designated Sites

As detailed in Table 12.1.1, two marine qualifying features associated with designated sites will be considered further within this section. These are:

- Harbour seal (*Phoca vitulina*) associated with Eileanan Agus Sgeiran Lios Mór SAC; and
- Harbour porpoise (*Phocoena phocoena*) associated with Inner Hebrides and the Minches SAC.

The features listed above will be considered further in Sections 14.2.2.8 and 14.2.2.3 respectively.

14.2.2.2 Cetaceans

Of the approximately 32 species of cetacean (whales, dolphins, and porpoise) found in UK waters, four species of cetacean have been identified as potentially occurring near the proposed CFIIS location. These include harbour porpoise, bottlenose dolphin (*Tursiops truncatus)*, short-beaked common dolphin (*Delphinus delphis*) and minke whale (*Balaenoptera acutorostrata*).

A summary of the cetacean species that are most likely to be present in the Corran Narrows is provided in Table 14.2.1. This table also outlines the likelihood of occurrence for each species, density estimates retrieved from the SCANS III report (Hammond *et al.*, 2017), and the estimated group size based on the information retrieved from sightings data (HWDT, 2023).

Table 14.2.1: Cetacean Baseline Summary

Species	Likelihood of Occurrence	Density Estimate per km^2 (SCANS III)	Estimated Group Size (HWDT Sightings Map)
Harbour Porpoise	Very likely	0.336	1 – 7
Bottlenose Dolphin	Unlikely	0.1206	2 – 3
Short-Beaked Common Dolphin	Possible/Occasionally	NA	2 – 6
Minke Whale	Extremely Unlikely	0.0271	1

14.2.2.3 Harbour porpoise

Harbour porpoise (*Phocoena phocoena*) are distributed throughout temperate and subarctic waters of the North Pacific and North Atlantic oceans and are the most abundant cetacean to occur in northwest European shelf waters. They are the UK's smallest, and most abundant cetacean, with the highest densities occurring along the North Sea coast, around the Northern Isles and the Outer Hebrides (Reid *et al.*, 2003). Harbour porpoise are found within Scottish waters throughout the year (Evans *et al.*, 2003; HWDT, 2023), with limited information on seasonal movements (Reid *et al.*, 2003).

At the mouth of Loch Linnhe lies the Inner Hebrides and the Minches SAC which is designated for harbour porpoise. The nearest boundary of the SAC is 25 km away from the CFIIS location. The SAC protects porpoise habitat of approximately 32% of the population found on the west coast of Scotland and contains the highest density of harbour porpoise in Scotland (NatureScot, 2020b).

There have been numerous sightings of harbour porpoise in Loch Linnhe according to the HWDT Sightings Map (HWDT, 2023) and NBN Atlas records (NBN Atlas, 2024), with sightings in almost every month between 2018 and 2022 (not consecutively). Sightings data also demonstrates that harbour porpoise have been sighted to the north and south of the Corran Narrows as well as transiting the areas of high flow within the Narrows themselves. Based on the sightings data available, harbour porpoise are expected to be the cetacean most likely to be encountered in the vicinity of CFIIS.

14.2.2.4 Bottlenose dolphin

Bottlenose dolphins are present in UK waters all year round and can often be seen close to shore. Infrequent sightings records of bottlenose dolphins have been identified within Loch Linnhe, south of the Corran Narrows (HWDT, 2023). The nearest sighting was recorded near Ballachulish (HWDT, 2023), approximately 3 miles seaward of the Narrows.

There are no records of bottlenose dolphins within or north of, the Narrows according to the HWDT Sightings Map and as shown in Table 14.2.1, bottlenose dolphin abundance was estimated at 0.1206 per km^2 (Hammond *et al.*, 2017). As such, this species is unlikely to travel into the upper reaches of Loch Linnhe and through the Corran Narrows, based on the available data.

14.2.2.5 Short-beaked common dolphin

The short-beaked common dolphin tends to be a summer visitor to Scottish waters, mainly recorded between May and October, when food is most abundant (HWDT, 2018). However, sightings have been reported within Loch Linnhe across every month since 2014 (HWDT, 2023). Common dolphins are one of the most abundant cetacean species and they are the most numerous offshore cetaceans in the north-east Atlantic (Reid *et al.*, 2003).

According to the HWDT Sightings Map, short-beaked common dolphins have been identified within Loch Linnhe in low numbers (<6 individuals) on eleven occasions since 2017 (HWDT, 2023). No density estimates for short-beaked common dolphin in the survey block which includes Loch Linnhe were provided as part of the SCANS III surveys.

It can be anticipated that short-beaked common dolphins may, on occasion, be within close proximity of the proposed CFIIS location based on sightings data.

14.2.2.6 Minke whale

The minke whale is the most common baleen species recorded in British shelf waters, and high densities are present off the west coast of Scotland, particularly in the Minch (Reid *et al.*, 2003). However, insufficient data on population size has made it difficult to establish the conservation status of minke whales and as such, this is unknown (Marine Scotland Science, 2020).

Based on the HWDT Sightings Map there has been one sighting of a minke whale within Loch Linnhe between 2010 and 2022 (HWDT, 2023). This sighting was recorded in August 2019, approximately 5.8 miles southwest of the Corran Narrows. In addition, as shown in Table 14.2.1, the abundance estimate for minke whale was very low at 0.0271 minke whales per km^2.

While minke whales are considered a coastal species, often occurring within 7km of the coast (Macleod *et al.*, 2004), it is extremely unlikely they would be in close proximity to the Corran Narrows, based on sightings data.

14.2.2.7 Grey seal

Grey seals (*Halichoerus grypus*) use coastal sites for breeding, pupping, and hauling out and use both inshore and offshore waters to forage and feed. Grey seals are present year-round in UK waters, breeding in Scotland during the autumn/winter season between September and December (Marine Scotland, 2020). The UK contains around 38% of the total world breeding population of grey seals and 88% of those breeding in Scotland, with major concentrations in the Outer Hebrides and Orkney. In 2020, the total UK grey seal population was estimated to be 157,300 individuals (SCOS, 2021). However, it appears that grey seals are not common in

Loch Linnhe and the surrounding areas. The NBN Atlas shows only three records of the species between 2007 and 2017. Population counts in 2019 identified only 6 individuals within the West Scotland 'Seil to SW Loch Linnhe' Seal Management Unit (SMU) subunit (Morris *et al.*, 2021). No grey seal haul-outs are identified near the Corran Narrows or within Loch Linnhe. It is therefore considered highly unlikely that grey seals will be in the vicinity of the CFIIS.

14.2.2.8 Harbour seal

Like grey seals, harbour seals also use coastal sites for breeding, pupping, hauling out and use both inshore and offshore waters to forage and feed. In UK waters, harbour seals are widespread around the west coast of Scotland, and present year-round. The breeding season in Scotland is between June – July, and the moult occurs in August when population counts are conducted (Hammond *et al.*, 2003).

Harbour seal numbers within the West Coast SMU, within which the CFIIS sits, are increasing. The population estimate for the West Scotland SMU in 2020 was approximately 15,500 individuals (SCOS, 2020), with 503 harbour seals estimated within the Seil to SW Loch Linnhe subunit (Morris *et al.*, 2021).

The nearest designated haul out site for the harbour seal is the eastern end of the Sound of Mull, approximately 37km south west of the proposed development. In addition, the Eileanan agus Sgeiran Lios Mór SAC designated for the species is approximately 19km from the CFIIS and was last assessed as 'Favourable Maintained' in 2014 (NatureScot, 2024). The most recent population count of seals in the SAC was conducted in 2018 and found to be 238 animals. This was deemed as fairly stable compared to previous years, but it was also identified that due to natural variation at the site it was not a good indicator of seal presence throughout the wider area (Morris *et al.*, 2021).

The species is commonly sighted within Loch Linnhe, with wildlife tour companies regularly noting their presence particularly on the tidal skerry known as 'Black Rock' located on the eastern side of upper Loch Linnhe approximately 4.5km NE from the CFIIS development. As such, the presence of harbour seals near the proposed CFIIS location is considered likely.

14.2.3 Potential Construction Effects

During the construction of the CFIIS, several possible impacts from construction activities for marine mammal receptors have been identified:

- Underwater Noise;
- Vessel and Construction Activity Interaction; and
- Dredge Activity Interactions.

14.2.3.1 Underwater Noise

The latest marine mammal auditory injury criteria provided by Southall *et al.* (2019) groups marine mammals into functional hearing groups and applies filters to the unweighted noise to approximate the hearing response of the receptor (Table 14.2.2). Southall *et al.* (2019) also presents acoustic injury onset-thresholds for both unweighted sound pressure level peak criteria (SPLpeak) and cumulative (i.e., more than a single sound impulse) weighted sound exposure level criteria (SELcum). This is presented as the received level thresholds which onset permanent threshold shift (PTS), where unrecoverable hearing damage may occur, and temporary threshold shift (TTS), where a temporary reduction in hearing sensitivity may occur

for marine mammal species. Noise emissions may also cause disturbance, behavioural and physiological impacts (Richardson *et al.*, 1995). Marine mammals are typically sensitive to noise at frequencies between 10 Hz and 180 kHz (Southall *et al.*, 2019).

Table 14.2.2: Impulsive criteria for PTS and TTS in marine mammals (Southall *et al.*, 2019).

Functional Hearing Group	Impulsive			
	Unweighted SPL_{peak} (dB re 1 µPa)		Weighted SEL (dB re 1 μPa^2s)	
	PTS	TTS	PTS	TTS
LF Cetaceans	219	213	183	168
HF Cetaceans	230	224	185	170
VHF Cetaceans	202	196	155	140

The species most likely to be present in the area around the CFIIS fall into the Low Frequency (LF; minke whale), High Frequency (HF; common dolphin and bottlenose dolphin) and Very High Frequency (VHF; harbour porpoise) categories, representing all functional hearing groups with a range of audible frequencies between 7 Hz and 160 kHz (Southall *et al.*, 2019). Underwater hearing thresholds for phocid seals have also been established and they are considered to have a broad hearing range with upper range limits up to 60 kHz (Southall *et al.*, 2019).

The main sources of underwater noise are discussed in Section 7. As detailed in Section 7.3, piling, rock stripping and potentially blasting could give rise to significant underwater noise levels with source noise levels likely to exceed levels that can cause auditory injury to marine mammals. The potential for auditory injury or disturbance to marine mammals depends on how close the marine mammal is to source, and how long they are exposed to increased noise levels. It is therefore proposed that underwater noise is modelled to provide sufficient understanding to allow the effects on marine mammals to be assessed and to inform Marine Mammal Protection Plan for noisy activities.

14.2.3.2 Vessel and Construction Activity Interaction

Construction of the CFIIS will involve increased vessel traffic associated with delivery of materials and installation of marine infrastructure.

Evidence for lethal injury from boat collisions with marine mammals suggests that collisions with vessels in Scotland is very rare (Cetacean Stranding Investigation Programme, 2011). Out of 478 post-mortem examinations of harbour porpoise in the UK carried out between 2005 and 2010, only four (0.8 %) were attributed to boat collisions. While this may indicate that collision with vessels infrequently occur, care must be taken when drawing conclusions from strandings data for overall population mortality, as many carcasses sink or drift at sea where they are not recorded.

Nonetheless, the Corran Narrows and nearby areas have consistent and frequent vessel presence associated with recreational and commercial craft entering/exiting upper Loch Linnhe, fish farm boat traffic and the frequent movement of the existing ferry service. Therefore, it is likely that marine mammal receptors, particularly those most common in the area (harbour porpoise and harbour seal) are regularly exposed to the presence of vessels. Subsequently, it is unlikely that medium-term increases in vessel traffic due to CFIIS construction activities will have a significant effect on marine mammal receptors. It should be noted that any vessels delivering materials to be used in construction would follow standard

shipping routes and would be expected to be slow moving operating primarily in shallow waters and therefore reducing the risk of disturbance and collision.

The CFIIS marine construction works are located either in the intertidal areas, or in shallow waters close to shore, areas less frequented by marine mammals. Due to the location of the works and the presence of construction equipment and people, it is unlikely that there will be any physical interaction between the works and marine mammals.

14.2.3.3 Dredge Activity Interactions

The construction dredge is likely to involve:

- Vessel movements in the dredge and land reclamation areas;
- Potential vessel movements to a dredge disposal site;
- Rock stripping and potential blasting;
- Removal of materials from the seabed;
- Deposit of dredge spoil in the land reclamation areas; and
- Potential deposit of dredge spoil to a dredge disposal site.

Vessel movements are considered in Section 14.2.3.2, the main concern associated with rock stripping and potentially blasting is underwater noise which has been considered within Section 14.2.3.1.

As discussed in Section 10.3.1.1, the seabed sediments have a low silt fraction, hence any dredge spoil entering the water column during dredge or infill activities is expected to drop back to the seabed quickly. As such no impact on marine mammals' ability to forage due to changes in water turbidity are expected.

Marine mammals are highly unlikely to be in the vicinity of the land reclamation works as discussed in Section 14.2.3.2 hence, physical interaction with dredge vessels or spoil material while dredge spoil is being placed in the land reclamation area is not deemed credible.

There does, however, remain a low risk that if dredge material is to be disposed at sea and a marine mammal were to be under the dredge vessel at the time of the deposit, it could be physically harmed by spoil material dropping through the water column. At this point it is thought unlikely that material will be disposed of to sea but that will be confirmed as the design develops and the BPEO is completed. If dredge disposal is required, Marine Mammal Risk Assessments for dredge disposal will be completed. These will inform the Marine Mammal Protection Plan, which is likely to include the requirement for observations to ensure no mammals are in the vicinity of the vessel during dredge disposal. With this in place the risk of harm is reduced to non-significant levels.

14.2.4 Potential Operational Effects

During the operational phase of the CFIIS, two possible impacts on marine mammal receptors have been identified:

- Underwater noise; and
- Vessel Interaction.

1.1.1.1 Underwater Noise

As discussed in Section 7.4., there are no operational activities predicted to increase noise levels such that they would have a noticeable, adverse impacts on marine mammal receptors.

As identified in Section 7.4.1, electric ferries are considered to produce less noise than conventional diesel-powered ferries, hence, the proposed NEV will reduce the amount of underwater noise generated by ferry journeys across the Corran Narrows. Reduction of noise would be beneficial to marine mammal receptors in this context, due to reduced possibility of signal masking and behavioural/physiological impacts from noise exposure.

Whilst the NEV is expected to result in lower underwater noise levels than the existing diesel ferries, the diesel-operated MV Corran will still be in use occasionally as the back-up vessel. As such a slight non-significant beneficial effect on marine mammals is predicted due to the introduction of the NEV.

14.2.4.1 Vessel Interaction

As outlined in Section 3.5: Operational Scenarios, the main activities associated with the ferry service will not change due to the CFIIS although the proposed service route in the operational phase is expected to lengthen slightly from approximately 420m to an estimated 550m. The current crossing is relatively short and is located approximately 150m away from the proposed new route. The new proposed ferry route is still relatively short and located close to the existing route. It is therefore, not expected that this would be considered a significant change and therefore unlikely to increase vessel interactions such that it would have an impact on marine mammals.

14.2.4.2 Dredge Activity Interactions

Maintenance dredging may be required to ensure the required water depths for operations are maintained. It should be noted that maintenance dredging during operations will likely result in disposal at sea and therefore, a Marine Mammal Risk Assessment would be required, and a Marine Mammal Protection Plan developed. As discussed in Section 14.2.3.3, this Marine Mammal Protection Plan is likely to include a requirement for observations to ensure that no mammals are in the vicinity of the vessel during dredge disposal. With this in place, the risk of harm is reduced to non-significant levels.

As discussed in Section 14.2.3.2, it is likely that marine mammal receptors, particularly those most common in the area (harbour porpoise and harbour seal) are regularly exposed to the presence of vessels. Subsequently, and in line with the implementation of mitigation as noted in Section 14.2.5, it is deemed unlikely that there will be any significant risk of disturbance, vessel strike or injury from dredge spoil disposal during any maintenance dredging and disposal.

14.2.5 Mitigation

To minimise the potential impact of the CFIIS on marine mammals due to interactions with construction works all vessels, including vessels under 10m in length, will adhere to the general principles in the Scottish Marine Wildlife Watching Code (SMWWC) when undertaking their activities.

Mitigation measures have been captured in the ISoM (Section 24) for implementation during construction.

14.2.6 Proposed Impact Assessment

It is proposed the potential impact of underwater noise on marine mammal receptors be **scoped in** to the EIA for the construction phase of the CFIIS.

It is proposed that vessel (and construction activity) interaction is also **scoped out** of the EIA due to no significant effects being anticipated with the implementation of mitigation as outlined in Section 14.2.5.

Operational impacts of underwater noise are not anticipated to be significant and hence are proposed to be **scoped out** of the EIA. During the operational phase, no significant effects from vessel interactions are anticipated with the implementation of mitigation as outlined in Section 14.2.5. It is therefore proposed vessel interactions are **scoped out** of the EIA.

If the project design and BPEO identify that there is a need to dispose of dredge spoil to sea, then a Marine Mammal Risk Assessment for dredge disposal will be completed and presented within the EIAR. A similar approach would be required for maintenance dredging. However, it is more appropriate for this risk assessment to be completed at the time of the dredge works so that specific plans can be taken in account. As such, consideration of harm to marine mammals during maintenance dredge disposal is **scoped out**.

Table 14.2.6 summarises the effects being scoped in and out of the EIAR.

Table 14.2.6: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Underwater Noise	In	Out
Vessel (and Construction Activity) Interaction	Out	Out
Injury due to Dredge Disposal at Sea.	In (if disposal to sea is required)	Out

The impact assessment for the construction phase will be informed by the outcome of the underwater noise modelling which will be presented in the Underwater Noise chapter of the EIAR (refer Section 7.5). The impact assessment will utilise publicly available marine mammal data, similar to that presented in Section 14.1.2, to understand the potential occurrence of marine mammals. Current PTS and TTS criteria, such as that presented in Table 14.2.2, will be utilised to understand whether harm could occur. Mitigation required to minimise effects including disturbance to marine mammals will be proposed in the EIAR and within Marine Mammal Protection Plans for noisy activities.

It is anticipated that an EPS licence will be required for some activities and hence, a Marine Mammal Risk Assessment will also be produced, this will be supported by the Marine Mammal Protection Plan for the EPS licence application.

14.3 Fish and Shellfish

14.3.1 Data and Information Sources

To understand the occurrence and distribution of fish species within the project area, several sources were used. NBN Atlas (NBN Atlas, 2024) and iRecord from the Centre for Ecology & Hydrology was used to examine distribution of anadromous fish species. Scientific literature was also explored to identify research on freshwater and marine fish species in the area.

14.3.2 Baseline

14.3.2.1 Diadromous fish

There are two categories of diadromous fish, anadromous and catadromous: anadromous fish reproduce in freshwater rivers but spend the rest of their adult lives in salt water, while catadromous fish reproduce in saltwater, and spend the rest of their lifecycle in freshwater. On the Scottish west coast, anadromous fish are represented by Atlantic salmon (*Salmo salar*) and sea trout (*Salmo trutta morpha trutta*). Catadromous fish include the European eel (*Anguilla anguilla*). All species are listed as UK BAP priority species, while salmon and eels are also PMFs. Additionally, salmon are protected under Schedule 3 of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

No sites within Loch Linnhe near the CFIIS are designated for diadromous fish, however, the area has several rivers that are important habitats. The Corran Narrows are an important transit site for migrating diadromous fish species, as they must pass through this area to leave or enter the upper reaches of the loch.

14.3.2.1.1 Atlantic Salmon

The Atlantic salmon (*Salmo salar*) starts its life in freshwater. Adult fish spawn in natal rivers during the autumn months where the eggs are laid in scooped out nest hollows in fine gravel known as 'redds'. The young salmon hatch (termed 'alevin') and quickly grow into 'parr' through a diet of freshwater invertebrate species. Parr remain in the river for two to three years, after which they begin to physiologically change in a process known as 'smoltification' prior to their migration to the sea where they spend their adult lives. Multi-sea winter salmon, or individuals which spend multiple years at sea, are listed as a UK BAP species (NatureScot, 2023b).

Atlantic salmon stocks have experienced consistent declines throughout their range. Between 1983 and 2016, numbers of salmon fell by more than half, with 43% of river populations at risk. Of the rivers surveyed, 7% no longer had viable salmon populations (NASCO, 2019).

The numbers of Atlantic salmon returning to natal rivers on the Scottish west coast are also in decline (Lochaber Fisheries Trust, 2008). Indeed, in 2017 the salmon population in the River Awe system (which enters Loch Linnhe from Loch Etive) was reported to have collapsed (Salmon and Trout Conservation, 2017). Counts and stock reports are unavailable for the region encompassing the Corran Narrows at the time of writing (Lochaber Fisheries Trust, 2023). With upper Loch Linnhe (north of the Corran Narrows) and Loch Eil, the Rivers Lochy, Loy and Lundy support salmon (Sim, 2023). Observations of salmon were also made at the mouth of the Rivers Righ, Gour, Chreagain and Scaddle, as well in Loch Eil (NBN Atlas, 2024). It is worth noting that any salmon migrating to or from these natal rivers will transit the Corran Narrows.

In addition, a MOWI operated finfish farm, 'Linnhe' (Site ID: FS0240), is located approximately 400m north-west of the CFIIS site. Atlantic salmon are farmed at this site.

14.3.2.1.2 Sea trout

Sea trout (*Salmo trutta morpha trutta*) are the anadromous forms of brown trout (*Salmo trutta*). It was previously believed sea trout were a different species or subspecies, but it's now widely accepted as an ecological form with different migratory behaviour (Tanguy *et al.*, 1994). Like Atlantic salmon, sea trout may spend a variable number of years in freshwater habitats prior to migrating. Sea trout post-smolts may stay within estuaries for extended periods of time, prior to moving into the wider sea (Malcolm *et al.*, 2010). Research by Pemberton (Pemberton, 1976) concluded sea trout post-smolts move from rivers to sea lochs/estuaries between April and early June, prior to moving to the open sea in late June to July, eventually returning in August to September. This study, however, was very localised with overall knowledge of post-smolt migratory movement limited.

Immature sea trout, regionally called 'finnock', are young sea trout that return to freshwater after only one year within the sea. These are common in Scottish estuaries, where they move in and out with the tides to feed (Scottish Government, 2017a). Finnock may move to large freshwater bodies to over-winter, prior to returning to sea during the spring months (Malcolm *et al.*, 2010; Scottish Government, 2017a).

As with Atlantic salmon, sea trout numbers have declined across the Scottish west coast (Lochaber Fisheries Trust, 2008). The species has been recorded at the mouths of the Rivers Righ, Gour, Scaddle, Kiachnish, Chreagain, Nevis and Lochy, however many of these observations are older than 20 years (NBN Atlas, 2024). Lochaber Fisheries Trust records from 2008 indicate the species was found in the Rivers Lochy and Nevis (Lochaber Fisheries Trust, 2008).

14.3.2.1.3 European eel

The European eel (*Anguilla anguilla*) is catadromous, spawning and emerging as 'glass eels' at sea, and entering river systems to grow to adult size. European eels spawn in the Sargasso Sea, undertaking extensive migrations as both adults and juveniles, however, no migratory eels (known as 'silver eels') have been caught at sea (NatureScot, 2023c). When eels enter freshwater, they are termed 'yellow eels' and may remain resident in water bodies for >20 years (NatureScot, 2023c).

The species has suffered large declines across Europe and recruitment of glass eels remains low (OSPAR, 2022). As such, the European eel is listed by the International Union for Conservation of Nature (IUCN) as Critically Endangered (Jacoby and Gollock, 2014). Populations of European eel on the Scottish west coast are poorly understood (Lochaber Fisheries Trust, 2008). Multiple observations of European eel are listed on the NBN Atlas, including near the mouths of the Rivers Righ, Scaddle, Gour, Chreagain, Lochy and Nevis (NBN Atlas, 2024).

14.3.2.2 Marine Fish and Shellfish

There are few up-to-date published records of the marine fish species that inhabit Loch Linnhe. Juvenile herring (*Clupea harengus*) surveys were conducted up until the mid-1980s (Berx *et al.*, 2015), after which west coast herring stocks collapsed. Both upper and lower Loch Linnhe are

included as potential spawning grounds for European sprat (*Sprattus sprattus*; Coull *et al.*, 1998).

Baited Remote Underwater Video (BRUV) surveys conducted around the island of Lismore within Loch Linnhe found juvenile whiting (*Merlangius merlangus*), gurnard (Triglidae), flatfish sp., and thornback skate (*Raja clavata*; Sim, 2021), however the site is >27km from the Corran Narrows and may not be representative of species within that area.

There are no commercial fisheries in operation within Loch Linnhe, however, lobster and Norway lobster (*Nephrops norvegicus*) creeling does take place (Berx *et al.*, 2015). Anecdotal angling reports from fishing spots within 15km of CFIIS suggest that catshark species, rays, skate, gadoids, and mackerel may be present. This suggests the loch is typical of other large sea lochs in Scotland.

There are two records of basking shark occurrence in upper Loch Linnhe and in Loch Eil, made in 2003 and 2005 (NBN Atlas, 2024), and it appears that this species is uncommon in the area.

14.3.3 Potential Construction Effects

Sources of impacts on fish and shellfish associated with the proposed CFIIS in the construction phase include:

- Habitat loss;
- Construction Activity Interactions; and
- Underwater noise.

14.3.3.1 Habitat Changes

The installation of structures associated with the CFIIS may cause permanent or temporary habitat loss which could affect both fish and shellfish receptors. Permanent habitat loss will occur where infrastructure is installed on the seabed or in the water column, such as the slipways, breakwater, land reclamation and the overnight berthing structure. Temporary loss may occur where the seabed is disturbed during dredging and for installation of components but where recovery is possible post-installation.

Species that currently utilise the habitat around the existing ferry infrastructure may be displaced during construction activities that remove habitat. While there may be temporary displacement during construction, the relatively small footprint and localised works, in conjunction with the surrounding area being typical of other larger Scottish sea lochs and therefore likely to provide ample alternative and suitable habitat, it is not expected that impacts would affect population levels of any fish or shellfish species.

14.3.3.2 Underwater Noise

Sources of underwater noise associated with the construction phase of the CFIIS are described in Section 7: Underwater Noise. Piling and rock stripping with potential blasting are the main sources of underwater noise likely to impact upon ecological receptors. Sensitivity to underwater noise is species-specific and dependant on frequency and levels. Underwater noise may cause behavioural changes, hearing damage, physiological effects, masking of biologically significant sounds or in extreme cases, mortality (Popper *et al.*, 2019).

The threshold for impact varies slightly between fish species that possess a swim bladder with those that use it for hearing being the most sensitive to noise. Those that do not use their

swim bladder for hearing are slightly less sensitive to noise. Fish without a swim bladder are least sensitive to noise of the three categories of fish.

Atlantic salmon can detect low frequency acoustic stimuli below 380Hz, coinciding with the most common frequencies produced during impact piling operations between 100Hz and 2kHz. A recent study found evidence of a response to higher frequency sounds between 400 and 800Hz. The same study found that a cohort of Atlantic salmon used in an experiment did not perceive pile driving playback noise as a stressor. This has been explained as potentially centring on the hearing ability of Atlantic salmon in that, compared to other species such as Atlantic cod (*Gadhus morhua*) and herring (*Clupea harengus*), salmon are particularly sound insensitive, lacking in secondary hearing modifications linking the swim bladder to the auditory system. This reduces the species sensitivity and bandwidth to detect a noise stimulus, resulting in a poorer ability to detect specific acoustic cues from background noise (Harding *et al.*, 2016) and therefore move away from the source.

Basking sharks do not have swim bladders, making them less sensitive to underwater noise than the diadromous receptors. They perceive sounds through particle motion and are considered able to detect frequencies between 20 – 1500 Hz (Chapuis *et al.*, 2019). No studies have yet documented changes to stress levels or mortality rates due to sound exposure (Wilson *et al.*, 2020). The species is afforded legal protection from disturbance within The Wildlife and Countryside Act 1981 and therefore requires a licence for activities that may cause disturbance. However, as basking sharks are not expected within the Corran Narrows or adjacent areas, it is unlikely this will be required.

The specific equipment and techniques utilised will determine source noise levels as discussed in Section 7. Noise dissipates rapidly with distance, the area in which noise levels are likely to be of a level that could cause harm or mortally to fish will be limited (actual distances will be confirmed by underwater noise modelling as discussed in Section 7.5). Fish are a mobile species and hence, have the ability to move away from sound sources. This is not the case for farmed fish, they are unable to move beyond the confines of their pens. As such it is imperative to fully understand the predicted noise levels from the construction works, to identify if, mitigation is required to prevent harm to fish within the fish farm.

The impacts of underwater noise on shellfish are poorly understood, however, they may show responses to noise from particle motion or sediment vibration. Invertebrates may change their behaviour when subjected to noise, with one study showing that Norway lobster moved and buried less frequently under ex situ exposure to 100 Hz-2 kHz noise at continuous SPLs between 135-140 dB re 1 µPa and impulse SELs of 150 dB re 1 µPa2s (Solan *et al.*, 2016). Construction phase noise modelling (see Section 7.5) will give more detail with regard to the expected noise levels and hence potential effects on shellfish.

14.3.3.3 Construction Activity Interactions

Marine construction works including land reclamation and the installation of marine structures of the CFIIS (i.e., overnight berthing structure, slipways, and breakwater) is unlikely to cause injury or incidental loss to mobile receptors such as fish. Shellfish may be at more risk. While individuals would be at risk of injury or loss from construction phase activities, the small footprint associated with the proposed CFIIS infrastructure suggests such impacts will be localised and have negligible population level impacts overall.

14.3.3.4 Dredge Activity Interactions

The main activity associated with dredging is outlined in Section 14.2.3.3. Fish are much more agile than marine mammals, and also considerably smaller, and as such, are unlikely to interact with vessels, hence collision risks for fish aren't typically considered.

The main concern associated with rock stripping and potentially blasting is underwater noise which has been considered within Section 14.3.3.2. Removal of materials from the seabed in terms of loss of habitat is discussed in Section 14.3.3.1.

As discussed in Section 10.3.1.1, the seabed sediments have a low silt fraction, hence any dredge spoil entering the water column during dredge or infill activities is expected to drop back to the seabed relatively quickly. As such no impact on fish ability to forage due to changes in water turbidity are expected.

It is highly unlikely that solids associated with dredging activities would reach the fish farm and hence, impact upon fish in pens. Not only are materials expected to drop out of the water column quickly and hence not move far but the predominant water flow in the area, on both spring and ebb tides, is anti-clockwise away from the fish farm and towards the area to be dredged.

14.3.4 Potential Operational Effects

Sources of impacts on fish and shellfish from the proposed CFIIS during the operational phase are limited. Some habitat loss occurring during construction will be permanent and hence continue into the operational phase of the project. It is not appropriate to consider it twice and hence habitat loss isn't considered during the operational phase.

14.3.4.1 Habitat Changes

The operational phase of the CFIIS may create new habitat through the creation of hard surfaces. Some evidence suggests that coastal infrastructure can negatively impact fish assemblages (Munsch *et al.*, 2017), particularly with materials such as concrete which is homogenous in design and may leach chemicals which can have deleterious consequences to marine life (McManus *et al.*, 2017). Other studies indicate that presence of slipways and harbour infrastructure can provide refuge or foraging opportunities for fish species (Porter *et al.*, 2018). Ecologically sensitive design and construction materials have been shown to improve the biodiversity and species richness surrounding the infrastructure (Morris *et al.*, 2018; Perkol-Finkel *et al.*, 2017). The overall effect on the ecosystem is complex and is likely to be site and species-specific. The scale of the marine works associated with the CFIIS are such that significant effects, benefits or adverse associated with additional habitats are unlikely.

14.3.4.2 Underwater Noise Effects

As discussed in Section 14.2.4.1 for marine mammals there is a potential reduction in underwater noise due to the NEV, however, this minor localised change in soundscape is unlikely to benefit fish or shellfish.

14.3.4.3 Dredge Activity Interactions

Maintenance dredges are an infrequent activity and as discussed in Section 14.3.3.4, are not expected to give rise to significant effects on fish.

14.3.5 Proposed Impact Assessment

Habitat changes are proposed to be **scoped out** for fish and shellfish receptors due to the localised nature of the works and the small footprint. In addition to this, where displacement may occur, it is expected that this will only be temporary, and that the surrounding area provides vast and ample alternative habitat for fish and shellfish.

While fish and shellfish individuals would be at risk of injury or loss from construction phase activities, the small footprint associated with the proposed CFIIS infrastructure suggests such impacts will be localised and have negligible population level impacts overall. As such, it is proposed injury or incidental loss is **scoped out** of the EIA. No significant operational impacts on fish are predicted.

It is unknown at this stage if, underwater noise during construction would result in significant effects to fish or shellfish receptors, and hence it is proposed that underwater noise is **scoped in** to the EIA. The impact assessment for the construction phase will be informed by the outcome of the Underwater Noise chapter of the EIAR (see Section 7.5). It will specifically consider effect on Salmon associated with the Linnhe fish farm.

Table 14.3.5.1: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Habitat Changes	Out	Out
Underwater Noise Effects	In	Out
Construction Activity Interactions	Out	NA
Dredge Activity Interactions	Out	Out

NA = Not applicable.

15 Materials and Waste

This section considers the potential impacts associated with the consumption of materials and resources and the production, management and disposal of waste associated with the construction phase of the CIIFS. It also covers the anticipated resource use and waste streams expected once the CIIFS is operational.

Note item 1(c) of Schedule 4 of the marine and terrestrial EIA regulations refers to 'the nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used'. As impacts on water, land, soil and biodiversity 'resources' are covered by other sections of this report (i.e. Section 10: Water Quality, Section 9: Geology, Land and Soils, Section 13: Terrestrial Ecology and Ornithology and Section 14: Marine Ecology), this section will consider the consumption of 'materials'.

As per the IEMA guide to: Materials and Waste in Environmental Impact Assessment (IEMA, 2020b), 'materials' are physical resources that are used across the lifecycle of a development. Examples include concrete, steel, aggregate, bituminous material, bricks and timber, but also excavated arisings, including soil, rock or similar resources generated by excavations. This IEMA guidance also states that materials are, in their own right, sensitive receptors, and consuming materials impacts upon their immediate and (in the case of primary materials)

long-term availability. This results in the depletion of natural resources and adversely impacts the environment. For waste, the sensitive receptor is landfill capacity, which is also a finite resource.

IEMA defines waste as 'any substance or object which the holder discards or intends or is required to discard'. Ongoing disposal of waste requires continued expansion or development of landfill facilities, depleting natural and other resources which, in turn, adversely impacts the environment (IEMA, 2020b).

15.1 Legislation, Policy and Guidance

Legislation relevant to the management of resources and waste includes:

- Section 34 of the Environmental Protection Act 1990 (as amended) (UK Government, 1990);
- The Waste (Scotland) Regulations 2012;
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011, as amended (CAR);
- The Environmental Protection (Duty of Care) (Scotland) Regulations 2014; and
- Control of Substances Hazardous to Health (COSHH) Regulations 2002 (referred to hereafter as 'COSHH Regulations').

It is recognised that other waste management legislation may be applicable to specific waste items and activities that could arise; these would be considered on a case-by-case basis as appropriate.

In 2010, the Scottish Government published Scotland's Zero Waste Plan (Scottish Government, 2010), which sets out the government's vision for a sustainable and resource efficient future. While the sustainable resourcing aspect of the vision is still to be brought into legislation, developments should strive to fulfil the following two components of the vision:

'Individuals, the public and business sectors - appreciate the environmental, social and economic value of resources, and how they can play their part in using resources efficiently'; and

'Reduce Scotland's impact on the environment, both locally and globally, by minimising the unnecessary use of primary materials, reusing resources where possible, and recycling and recovering value from materials when they reach the end of their life.' (Scottish Government, 2010).

Zero waste policy principles are captured in Policy 12 of NPF4, for which the policy outcomes are:

- *'The reduction and reuse of materials in construction is prioritised.*
- *Infrastructure for zero waste and to develop Scotland's circular economy is delivered in* appropriate locations.'

Relevant Scottish Government policy as part of Scotland's NMP includes:

- **GEN 11 Marine Litter**: Developers, users and those accessing the marine environment must take measures to address marine litter where appropriate. Reduction of litter must be taken into account by decision makers; and

- **GES 11**: Properties and quantities of marine litter do not cause harm to the coastal and marine environment (Scottish Government, 2015a).

Other relevant guidance sources used in this section include:

- GPP 2: Above Ground Oil Storage (NIEA, DEFRA, SEPA and NRW, 2018a); and
- GPP 5: Works and Maintenance in or Near Water (NIEA, DEFRA, SEPA and NRW, 2018c);
- GPP 6: Working at Construction and Demolition Sites (NIEA, DEFRA, SEPA and NRW, 2023);
- Guidance on Applying the Waste Hierarchy (Scottish Government, 2017b);
- Managing Waste in New Developments (THC, 2013b);
- Sustainable Design Guide (THC, 2013c); and
- IEMA guide to: Materials and Waste in Environmental Impact Assessment (IEMA, 2020b).

15.2 Baseline

Operations for the Corran Ferry service, in its existing state, involves a relatively low consumption of materials. The primary consumable utilised is diesel. Water use is addressed in Section 10: Water Quality.

When fully operational, the existing Corran Ferry service consumes approximately 850 litres of diesel per day, or just over 310,000 litres per year. Refuelling of the existing diesel ferries is undertaken by driving a fuel tanker lorry onto the vehicle deck of the ferry to refill the fuel tank onboard.

Waste generated from the service of the Corran Ferry is primarily associated with passengers' activities on the vessels and within the marshalling areas. Food and packaging waste is managed by the provision of general waste and recycling bins near the Ardgour slipway and on the vessel decks. Small general waste bins are provided in the existing toilet block in Corran. This waste is collected and disposed by Highland Council services.

15.3 Potential Construction Impacts

Potential impacts associated with materials and waste have been considered in line with guidance of IEMA's guide to: Materials and Waste in Environmental Impact Assessment (IEMA, 2020b).

15.3.1 Materials

Construction of the proposed CFIIS is expected to include management of the following bulk materials:

- Metals for the maritime structures including piles, fendering support steelwork and fixtures (bollards, barriers, handrailing, ladders, grab rails etc), alignment structure steelwork frames, lighting columns, signage and reinforcing within the concrete elements;
- Plastics and rubber for drainage, ducting and the fendering system;
- Imported rock and aggregates for rock armour, infill and earthworks/landscaping;
- Excavated arisings (i.e., rock and soils);
- Bituminous material for surfacing of marshalling areas, roads and paths;

- Concrete, primarily for the slipways, overnight berthing structures, retaining walls, foundations, thrust blocks, steps and kerbing;
- Timber for linear fenders, copes and roof trusses; and
- Bricks and tiles for buildings.

Impacts associated with materials in the CFIIS may include:

- Consumption of resources and materials;
- Material storage and use;
- An intrinsic carbon cost of materials. Note that carbon calculations are considered in Section 22: Climate Change and are therefore not discussed further in this section; and
- Impacts associated with the transport of materials, namely carbon emissions and traffic impacts and dust arising from traffic movements. Carbon emissions are considered in Section 22: Climate Change, impacts on roads and traffic is considered in Section 18: Traffic, Transport and Access, and impacts from dust associated with transport of materials is considered in Section 6: Air Quality. As such, these impacts are not discussed further in this section.

15.3.1.1 Consumption of Resources and Materials

The materials listed above are all finite resources, although some metals such as steel may have a recycled component. They have however, been selected for their structural suitability, durability and lack of degradation over the considerable operational lifetime expected of the CFIIS infrastructure. The consumption of these materials for the CFIIS has an inherent, though relatively small, environmental cost.

Where possible, electricity may be taken from the local grid for construction welfare and office facilities, lighting and small power tools. If grid connection is not available, diesel will be utilised to power generator(s) for the supply of electricity for these purposes.

The consumption (i.e. loss) of excavated arisings (i.e., rock, soils) is discussed in Section 3.4: Geology, Land and Soils.

15.3.1.2 Material Storage and Use

Consumables used during CFIIS construction works will include fuels, oils, paints and other hazardous substances which, in addition to being a consumption of resources (see Section 15.3.1.1), could, if released to the environment, cause harm to human health or pollute the environment.

Furthermore, the storage of materials such as soils and aggregate can give rise to dust as discussed in Section 6: Air Quality or give rise to silty water run-off as discussed in Section 10: Water Quality. As such, it is important to ensure that materials are appropriately managed to ensure that any potential impacts are minimised (see Section 15.5 for proposed mitigation).

The effects of loss of containment of materials to air, ground or water are addressed in Section 6: Air Quality, Section 9: Geology, Land and Soils and Section 10: Water Quality, respectively.

15.3.2 Waste

Waste arisings during construction of the CFIIS are expected to include:

- Dredge spoil;
- Excess excavated arisings;
- Steel, concrete and potentially infill material from demolition of the Ardgour small pier;
- Arisings from welfare facilities (i.e., food waste, packaging and sewage);
- Various other miscellaneous materials such as packaging and cable off-cuts from general construction activities; and
- Hazardous materials (e.g., cement washings, paints, oils, etc. May include biological hazardous materials such as soil contaminated with INNS).

Waste management will align to the waste hierarchy of prevention, reuse, recycle, recover other value and disposal, in line with Guidance on Applying the Waste Hierarchy (Scottish Government, 2017b) and Managing Waste in New Developments (THC, 2013b).

The proposed dredging operations are anticipated to give rise to a volume of dredge spoil up to 25,000m^3. In accordance with the waste hierarchy, the preference is to re-use dredge material where practicable, for example as infill material. This is however, dependent on the cut and fill calculations (refer Section 15.5) and suitable properties of the spoil material, though results of the ground investigations imply the spoil material will be largely suitable for re-use. Should material not be of a suitable composition for re-use, or if spoil volumes are in excess of what can be re-used, it may be considered for at-sea disposal at a licensed dredge disposal site. This will be determined as part of a BPEO assessment undertaken in support of any Marine Licence application for the CFIIS.

As discussed in Section 9: Geology, Land and Soils, excavated arisings (rock, soils etc) will be re-used as part of CFIIS construction where material suitability allows. The intent is to reuse the soils in the reprofiling of the surrounding areas where practicable, although a cut and fill calculation has not yet been completed (see Section 15.5: Mitigation) and hence, there is potential for excess excavated material to be disposed or re-used offsite.

Demolition of the existing Ardgour pier as part of the construction phase is also expected to generate waste material. Where suitable, materials recovered from the demolition (e.g. crushed concrete, infill) will be re-used in the scheme. It is expected the steel will be suitable for recycling.

Other construction waste arisings will be segregated and if not suitable for onsite reuse, then will be recycled offsite. As a last resort, these may be disposed of to landfill. Hazardous wastes will be disposed of via an appropriately by a licenced contractor.

Within the footprint of the scheme on the Nether Lochaber side is a patch of an INNS, Japanese Knotweed (refer Section 13: Terrestrial Ecology and Ornithology for further details and mitigation). The management plan for INNS will consider any specific disposal requirements for plant or soil material arisings, taking account of the specific risk and need to prevent spread of INNS.

Inappropriate management of waste from welfare facilities or other miscellaneous construction activities could give rise to litter in the terrestrial or marine environment, waste will be managed as per the mitigation in Section 15.5.

15.4 Potential Operational Impacts

15.4.1 Materials

15.4.1.1 Consumption of Resources and Materials

As with existing operations, the primary material consumable for the operational phase of the CFIIS will be diesel.

As discussed in Section 2.6: Design Development, it was confirmed through consultation with SSEN that a suitable upgrade to the existing grid was required (to be undertaken by SSEN) and a temporary diesel generator could be used for overnight charging of the NEV in the interim while awaiting this grid upgrade and connection.

Diesel will be required in the short to medium term to run the temporary generator used to charge the NEV until a grid upgrade is complete and connection provided. Volumes of diesel consumption are expected to be approximately 850 litres per day, similar to existing operations. In addition, the NEV will house a small diesel generator on board to be utilised only for emergencies (such as network power failure preventing overnight battery charging) and to potentially provide additional power generation capacity and/or transit to maintenance or repair facilities. Therefore, once power for NEV charging is supplied from the grid, diesel consumption for the CFIIS (and Corran Ferry service) will be greatly reduced compared to the current operation of a primary diesel vessel.

15.4.1.2 Material Storage and Use

Diesel for the generator will be stored in alignment with CAR General Binding Rule 28. As such, no significant effects from this storage are expected.

15.4.2 Waste

15.4.2.1 Generation and Disposal of Waste

Although the marshalling area provides increased capacity, an increase in passengers and users can be attributed to increased demand for the ferry service, rather than as a result of the CFIIS. The material procurement and construction strategy of the CFIIS will seek to maximise recycling opportunities and minimise potential adverse effects on the local surroundings and landfill capacity through consideration of material re-use (where practicable) and effective waste management in line with the legislation and guidance outlined in Section 15.1. Details will be captured in a Waste Management Plan (refer Section 15.5).

Maintenance dredging, if required, at the overnight berthing structure and/or slipways, may result in dredge spoil material in need of re-use or disposal. Maintenance dredges, if required, are expected to be infrequent and disposal of this waste will be manged in line with the marine licensing process and BPEO assessment.

15.5 Mitigation

A Materials Management Plan will be put in place to detail the storage and handling requirements of materials that have a potential to affect the environment. This will take into account the requirements of relevant legislation and guidance as detailed in Section 15.1.

All waste not able to be reused will be appropriately segregated to facilitate recycling. Waste removed from site will be disposed of by a licensed waste contractor in line with the waste hierarchy and applicable policy and guidance included in Section 15.1.

A Waste Management Plan will be put in place for the construction works, this will be included within the CEMD. It will take account of relevant legislation and guidance, including alignment to the waste hierarchy. There will be an emphasis on the need for good waste management practices to minimise risks of litter.

As discussed in Section 13, the INNS management plan will include consideration with regard to the handling of waste.

It is recognised that the mitigation identified within this section works hand in hand with mitigation identified in other sections of this report to minimise waste arisings (e.g., reuse of materials on site as detailed in Section 9.5). Pollution risks to air, soil and water are discussed in Section 6: Air Quality, Section 9: Geology, land and Soils and Section 10: Water Quality, respectively.

15.6 Proposed Impact Assessment

With the implementation of mitigation outlined in Section 15.5, impacts associated with materials and waste will not result in any significant effects. Therefore, an assessment of effect significance will not be undertaken in the EIAR chapter. Instead, it is proposed that the EIAR chapter for Materials and Waste identifies and quantifies construction materials in terms of volume and environmental lifecycle cost and details the waste strategy for the CFIIS. This information will be utilised to inform the detailed design and procurement process so that, wherever possible, quantities of materials consumed, and waste generated can be minimised.

Detailed designs and construction planning will seek to reduce the volume of materials consumed, where practicable reuse materials on site to achieve a cut and fill balance, to minimise the consumption.

A summary of scoping is outlined in Table 15.6.1.

Table 15.6.1: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Consumption of Materials and Resources	In	Out
Materials Storage and Use	Out	Out
Waste Management	In	Out

16 Landscape and Visual

This section addresses the potential direct and indirect effects of the proposed CFIIS on landscape, seascape, and visual interests. These are defined respectively within the Landscape Institute and IEMA Guidelines (2013) for Landscape and Visual Impact Assessment (GLVIA) as:

'The constituent elements of the landscape, its specific aesthetic or perceptual qualities and the character of the landscape';

'Landscapes with views of the coast or seas, and coast and adjacent marine environments with cultural, historical, and archaeological links with each other'; and

'The people who will be affected by changes in views or visual amenity at different places'.

Note, the potential for impacts from scheme lighting on human health and protected fauna species are discussed in Section 21: Human Health and Section 13: Terrestrial Ecology and Ornithology, respectively. Development can also have effects on sites of cultural or historical significance. Landscape and visual impacts with regard to setting of these features are discussed in Section 17: Archaeology and Cultural Heritage.

16.1 Policy and Guidance

Relevant policy for landscape and visual assessment includes:

- PAN 60: Planning for Natural Heritage;
- Policy 61 of the HwLDP which states: '*New developments should be designed to reflect the landscape characteristics and special qualities identified in the Landscape Character Assessment of the area in which they are proposed*';
- The WHILDP (THC, 2019) which references Special Landscape Areas; and
- NMP general policies and GES, including:
    - ***GEN 7 Landscape/Seascape****: Marine planners and decision makers should ensure that development and use of the marine environment take seascape, landscape and visual impacts into account* (Scottish Government, *2015a).*

Landscape and visual guidance referenced in this section includes:

- Visualisation Standards for Wind Energy Developments (THC, 2016a);
- Pre-application Advice for Major Developments pack (THC, 2023a); and
- Institute of Lighting Professionals Guidance Note GN01:21: The Reduction of Obtrusive Light (Institute of Lighting Professionals, 2021).

16.2 Baseline

The Corran Narrows are situated in the region of Lochaber, within the Landscape Character Type (LCT) of Lochs with Settled Edges (NatureScot, 2023d). This LCT includes the 'ribbon lochs' of Loch Leven; Loch Linnhe, and Loch Eli along the Great Glen. This landscape type is characterised by a flat landscape contained between steep slope loch slides and open water and is anecdotally acknowledged as being a region of considerable natural visual amenity. The LCT is distinguished by its relatively high density of settlement, including farms and crofts, towns and villages and main road links.

The Ardgour Special Landscape Area (SLA) is adjacent (within 100m) to the existing Ardgour slipway (THC, 2019). SLAs are landscapes that are seen as being of regionally significant landscape and visual quality. As per guidance from THC Planning in the Pre-application Advice for Major Developments pack (THC, 2023a), it is reasonable to treat the CFIIS location as being within the SLA. As stated in the Assessment of Special Landscape Areas (THC and SNH, 2011), 'The Ardgour peninsula has a distinctive identity comprising rugged interior mountains contrasting with the wooded and sheltered shorelines of Loch Linnhe. Located on the quiet side of Loch Linnhe this area has an almost island sense of detachment even though it is part of the mainland'. Notably, it is clear from key characteristics of the Ardgour SLA that ferry arrival is important to the sense of place, that is, the peninsula character is reinforced be the sense of remoteness and the typical mode of arrival in the area – by either the Corran Ferry or via a long circuitous land route.

National Scenic Areas (NSA) are areas of nationally important landscape with special qualities that are designated for safeguarding and enhancement through national and local policy (NatureScot, 2023e). The Corran Narrows are approximately 1.4km north/north-west from the Ben Nevis and Glen Coe National Scenic Area.

Ardgour represents a small historic, seaside settlement. In comparison, the shorefront of Corran consists of some modern 'new build' houses. The existing ferry infrastructure (i.e., slipways, Ardgour small pier) is relatively low lying (≤6.1mCD), near the level of MHWS, with the exception of some light posts and signage. Marshalling lanes are flush with the A861 in both settlements. Ground level of seafront houses and commercial properties in both Ardgour and Corran are situated at +5.6mCD or higher, often with floor levels and window panes notably higher still. As such, existing infrastructure has minimal visual impacts on these receptors, although the existing ferry infrastructure is visible from each settlement opposite the narrows and from the ferry during crossings.

Forming part of the spectacular Caledonia Way long-distance route, National Cycle Network Route 78 runs throughout the Argyll and Bute, Great Glen and Highland areas in the west and north of Scotland (Sustrans, 2024). National Cycle Route 78 utilises the Corran Ferry crossing, with the ferry service allowing cyclists coming from the north, on the west shore of Loch Linnhe, to continue their journey through Ardgour and Corran to continue south, now on the east shore of Loch Linnhe, and vice versa.

Receptors sensitive to the changed foreshore appearances will include local residents with views of the development, ferry users and visitors. Design of the CFIIS has, and will continue, to take into account the visual amenity of the area for residents and visitors alike, as the area functions as a popular tourist passage.

16.3 Potential Construction Effects

Construction activities are expected to be complete in 12 – 18 months. Whilst construction effects on visual and landscape amenity are generally adverse, impacts will be of a relatively short duration.

The majority of development on the Nether Lochaber side will be located north of the Corran settlement within an area of woodland. Retained trees will provide a natural visual screen between the construction works and visual receptors in this settlement, resulting in minimal,

if any, visual impacts. Construction activities on the Nether Lochaber side will, however, be visible for most houses at Ardgour, most of which are between 0.5km – 1km distance away.

Due to the sloping elevation profile, minor construction works for the shared-use path in Corran may be visible to approximately 13 houses in the settlement. These construction activities will be of short duration, and effects temporary.

Construction at Ardgour will be predominantly low-lying, although visible to a number of houses and commercial receptors in the village along the A861 and North Corran. Ardgour construction activities will be visible to up to 10 houses of Corran across the narrows (0.5km – 1km distance). Vessel activities associated with construction is also expected to have adverse, though short-term, effects on visual amenity to the receptors at Ardgour.

The construction compounds on both sides of the Narrows have been located in consideration of visual effects on receptors. Trees, vegetation and/or land elevation provide considerable screening of construction activities at these locations, hence adverse visual effects are unlikely to be significant for the temporary duration of use of construction compounds.

16.4 Potential Operational Effects

Development at both Ardgour and Corran has the potential for long-term landscape and visual effects to local receptors, both beneficial and adverse. As previously mentioned, CFIIS design is being undertaken in consideration of visual amenity, landscape character and setting. The CFIIS is considered in keeping with the current use of the area and landscape character.

Whilst the CFIIS will be predominantly low lying in the landscape, the tallest components of the scheme will be the lighting columns (up to 20m in height) and the NEV, which is conservatively estimated to be 20m in height, to the tallest aerial. Whilst operation of the new vessels is outwith the scope of the CFIIS, it is acknowledged the berthing of vessels on a shorefront structure at Ardgour (as opposed to current practice of moorings), will result in a change to landscape and visual effects. Furthermore, the NEV to be introduced will be larger than the existing vessels.

The exact location of scheme components and services (e.g., temporary diesel generator) will be determined during detailed design, however these will be located within the scoping boundary and less than 10m in height. Hence these will not change the proposed impact assessment (refer Section 16.5 for details).

The CFIIS infrastructure will be highly visible for residents and businesses at Ardgour, shorefront properties of Corran and passengers of the ferry service. New infrastructure could have beneficial and/or adverse landscape and visual effects on these receptors. CFIIS development north of Corran, specifically involving the opening up of woodland areas, may result in positive landscape and visual effects by creating a new public viewpoint.

A number of individual dwellings at Corran and Ardgour will have views of ferry traffic pre- and post-boarding. Traffic impacts are considered in Section 18: Traffic, Transport and Access, however in term of visual impacts, relocating the ferry infrastructure to the north of Corran will divert ferry traffic out of the settlement and hence, reduce the volume (and subsequent adverse effects) of visible traffic to Corran receptors. Slight relocation and change in height of the Ardgour slipway and approach may result in a slight change in traffic visibility to Ardgour or Corran receptors which will be considered during the impact assessment (see Section 16.5).

16.5 Proposed Impact Assessment

Potential landscape and visual impacts during the construction phase will be temporary (up to 18 months) and reduced by the siting of the construction compounds. Subsequently, no significant effects on landscape and visual amenity during the construction phase of the CFIIS are expected. As such, it is proposed Landscape and Visual is **scoped out** of the EIA for the construction phase.

Due to the scale of change and potential for long-term impacts as a result of the CFIIS, it is proposed that Landscape and Visual is **scoped in** to the EIA process for operations.

A full Landscape and Visual Impact Assessment (LVIA) will be undertaken, in accordance with the THC's Visualisation Standards for Wind Energy Developments (THC, 2016a). The LVIA, including visualisation panoramas (i.e., photomontages), informed by desk-based studies and a site field visit. The LVIA will be completed by a Landscape Architect, who will carry out their fieldwork in clear weather conditions. In addition to carrying out the assessment, the Landscape Architect will work with the design team, to identify ways in which to minimise landscape and visual impacts and where possible identify enhancement.

The LVIA will be included as part of the EIAR. As an overview, the objectives of the LVIA would be to:

- Describe the methodology and criteria used to inform the assessment process;
- Identify the landscape related policy context and guidance;
- Identify and assess the key landscape and visual baseline conditions and associated sensitivities;
- Identify design principles and other mitigation measures embedded into the design of the project to help minimise any likely significant adverse effects; and
- Identify and evaluate any residual landscape, visual and cumulative effects, including direct and indirect, based on the worst-case parameters as currently known.

Although inter-related, landscape effects are assessed separately to the effects on views and visual amenity. Visual effects are primarily concerned with the changes in people's views through intrusion or obstruction and whether important opportunities to enjoy views may be improved or reduced. Landscape effects consider the fabric, character and quality of the site and surrounding landscape and are concerned with:

- Landscape elements (e.g. hedgerows, trees and woodlands);
- Landscape character (local and regional distinctiveness); and
- Special interests and values (e.g. designations, conservation areas and cultural associations).

The significance level assessment for landscape and visual effects will include a detailed viewpoint assessment and be based on pre-defined criteria outlined in the LVIA. Field survey assessment tables will provide a framework that helps to ensure consistency and transparency in the decision-making process but are not used as prescriptive tools, allowing for the exercise of professional judgement in determining sensitivity, magnitude and significance.

Operational lighting schemes are still to be developed and potential effects are not fully understood at this time, hence potential visual effects from operational lighting will be discussed in the LVIA.

Proposed Viewpoints for LVIA have been determined utilising Zones of Theoretical Visibilities (ZTVs). Bare Earth and Screened ZTVs have been developed for the CFIIS outline design and are depicted in Drawings 99_DRG_09 and 99_DRG_10. ZTVs were based on a very conservative 10m high box across the footprint of all scheme infrastructure and 20m height of berthed vessels. Only lighting columns have the potential to be designed and installed above 10m, however, these will be narrow and not affect the ZTV output. A 5km radius study area was proposed for the ZTVs in consideration of the conservative maximum height allocations and low-lying location.

Drawing 99_DRG_10 is a 'screened' ZTV, which takes into account screening from vegetation and existing buildings that alters visibility through the landscape. Note, the actual percentage visibility will be much lower in all cases, as the 10m high components on the site are the lighting columns, which take up a much smaller space in the vista than the solid 10m high box modelled.

Drawing 99_DRG_10 depicts proposed viewpoints for photomontages to inform the LVIA. These viewpoints have been selected with regard to the potential effects on receptors as outlined in Table 16.5.1. The number of proposed photomontages, as well as photomontage direction and target subject(s) are also included in Table 16.5.1.

Table 16.5.1: Details of Proposed Viewpoint Selection and Photomontages for the LVIA

Viewpoint Number	Viewpoint Name	Receptors	Proposed Number of Photomontages	Photomontage Direction and Target Subject(s)
VP 1	Linnhe Picnic Area	Recreational receptors.	1	SW towards CFIIS development on both sides of the Narrows.
VP 2	Corran Existing Slipway	Residential settlement and road users on the A82 and A861.	2	NNE towards CFIIS development on Nether Lochaber side.
				WNW towards CFIIS development on Ardgour side.
VP 3	Ardgour South	Residential settlement, road users on the A861 and National Cycle Route 78 and ferry users.	2	ENE towards CFIIS development on Nether Lochaber side. Photomontage will present the view across Loch Linnhe, to show the CFIIS on the Nether Lochaber side for ferry passengers embarking at Ardgour.
				NNW towards CFIIS development on Ardgour side.

Viewpoint Number	Viewpoint Name	Receptors	Proposed Number of Photomontages	Photomontage Direction and Target Subject(s)
VP 4	Ardgour Village	Residential settlement and road users on the A861 and National Cycle Route 78.	1	East, toward CFIIS development on both sides of the Narrows. Direction will be subject to visible field of view due to close proximity of infrastructure.
VP 5	A861, North of Ardgour	Road users on the A861 and National Cycle Route 78.	1	SE towards CFIIS development on both sides of the Narrows.
VP 6	New slipway on Nether Lochaber side	Recreational receptors and ferry users.	1	WSW towards CFIIS development on Ardgour side. Photomontage will present the view across Loch Linnhe, to show the CFIIS on the Ardgour side only for ferry passengers embarking from the Nether Lochaber side. Note, new infrastructure proposed for the Nether Lochaber side will not be represented in the foreground to avoid obscuring views from immediate proximity.
VP 7	North of CFIIS on Nether Lochaber side	Transitory receptors on the A82 trunk road.	1	South, towards CFIIS development on Nether Lochaber side. Viewpoint will focus on the development on the Nether Lochaber side only. Viewpoint is anticipated to be taken from the loch foreshore due to lack of accessible photography locations on the A82 with visibility of the proposed development.

As discussed in Section 12, there is likely to be a need for compensation tree planting, due to the felling of woodland on the Nether Lochaber side. The details of compensation planting have not yet been confirmed, as such it is not yet fully understood if the planting will change views from any of the receptors. Hence, once the tree planting plans are developed, the potential viewpoints that may be influenced will be identified. For these viewpoints, photomontages will be produced to show the proposed tree planting at year 1 and year 10.

Whilst the vessels are out of scope of the CFIIS, it is acknowledged the ferry use of the infrastructure is an integral part of operations. The CFIIS will result in vessels no longer being moored on offshore swing moorings, but berthed on the overnight berthing structure, hence vessels on their berths will contribute to the visual effects of the infrastructure scheme. For photomontages/visualisations depicting the berthing structure, predicted view sheets will be produced for two scenarios; the proposed development as infrastructure only, and the proposed development with the addition of one berthed ferry vessel. One vessel will be shown on the berth only, noting that during operational hours, one vessel will be in use, and hence the berthing of two vessels concurrently is predominantly only applicable overnight.

Consultation from relevant statutory agencies including THC Planning, the MD and NatureScot is requested on both study area size and viewpoint selection with regard to the LVIA. A summary of the scoping outcomes for landscape and visual effects is included in Table 16.5.2.

Table 16.5.2: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Landscape Effects	Out	In
Visual Effects	Out	In

17 Archaeology and Cultural Heritage

The United Nations Educational, Scientific and Cultural Organization (UNESCO) defines cultural heritage as 'the legacy of physical artefacts and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations'. Historic environment interests cover world heritage sites, scheduled monuments and their setting, gardens and designated landscapes, Category A listed buildings and their setting, battlefields and their respective inventories, Historic Marine Protected Areas and marine archaeology.

17.1 Legislation, Policy and Guidance

The statutory framework for heritage in Scotland is outlined in the Town and Country Planning (Scotland) Act 1997, as amended, in the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 and the Ancient Monuments and Archaeological Areas Act 1979, both of which are modified by the Historic Environment (Amendment) (Scotland) Act 2011. Given that works will take place around Corran Ferry and within Loch Linnhe the Merchant Shipping Act 1995 and the Marine (Scotland) Act 2010 may also apply.

The implications of these Acts with regard to planning policy are described within NPF4 (Scottish Government 2023), Historic Environment Policy for Scotland (Historic Environment Scotland 2019), PAN2/2011 (Scottish Government, 2011c) and Policy 57 of the HwLDP (THC, 2012). For heritage assets found in a marine context, policies are contained within Scotland's NMP (2015) and Policy 49 of the HwLDP. Any aircraft lost while in military service is automatically protected under the Protection of Military Remains Act 1986 including aircraft lost at sea.

The Historic Environment Policy for Scotland (Historic Environment Scotland, 2019) sets out the Scottish Government's policy for the sustainable management of the historic environment.

Guidance relevant to the assessment and utilised in this section includes:

- Historic Environment Scotland's (HES) Managing Change in the Historic Environment series and particularly the guidance on setting (HES, 2016 updated 2020);
- Scottish Natural Heritage (now NatureScot) and HES published guidance on undertaking EIA in their EIA Handbook (SNH and HES, 2018);
- Highland Historic Environment Strategy (THC, 2013e); and
- Pre-application Advice for Major Developments pack (THC, 2023a).

17.1.1 Data and Information Sources

A preliminary review of the following datasets has been undertaken in order to inform the baseline:

- National Record for the Historic Environment (NRHE) as held by HES online; For designated and non-designated terrestrial and marine heritage asset data, including Canmore Maritime (HES, 2024);
- National Map Library (2024): For old Ordnance Survey maps (1st and 2nd Edition, small- and large-scale), pre-OS historical maps, pre Hydrographic Office (HO)/United Kingdom Hydrographic Office (UKHO) charts and historic HO/UKHO charts.
- UKHO Marine Data Portal (UKHO, 2024) For UKHO Register of Wrecks.

17.2 Baseline

17.2.1 Study Areas

In order to assess the potential for effects on cultural heritage assets resulting from the CFIIS, the following study areas, as depicted in Drawing 01/27114/Sco/01/01, have been identified:

- A core study area, shown as 'site boundary' in Drawing 01/27114/Sco/01/01, which includes the land and marine area, which will be subject to assessment for potential direct effects. This study area will be subject to a detailed walkover survey whereby cultural heritage assets which may be directly impacted by the scheme will be identified.
- A 1km study area for the identification of all known heritage assets and known previous archaeological interventions in order to help predict whether any similar hitherto unknown archaeological remains are likely to survive within the site and thus be impacted by the scheme.
- A 2km study area for the assessment of potential effects on the settings of all designated heritage assets including Scheduled Monuments, listed buildings, inventoried gardens and designed landscapes and battlefields, Conservation Areas, and assets deemed to be of National Significance in the Historic Environment Record.
- A 5km study area for the identification of all marine heritage assets. This is due to the nature of the wrecking process and the standard protocol for recording wrecks which means that the position of wrecking of a marine craft or ship is often an approximate position.

Drawing 01/27114/Sco/01/01 shows the location of heritage assets within 2km of the proposed development as per the outlined study areas above. Whilst it is recognised the proposed site boundary for scoping has slightly changed since these study areas were established, there has been no change to the development location that would materially

change the study areas and hence these are still considered valid. The inclusion of construction compounds does not change the study area extents but will be considered in the EIA (refer Section 17.5: Proposed Assessment).

17.2.2 Terrestrial Features

HES record four Category C Listed Buildings in the village of Ardgour. In the south of the core study area, they are a group of three 1860's Stevenson designed buildings; a lighthouse (LB1689; NRHE NN06SW 14); a lighthouse dwelling (LB1690; NRHE NN06SW 14.02).01); and a storage building, Cuil Righ, (LB1691; NRHE NN06SW 14.02). Also in the village is the Inn at Ardgour, an early 19th century hotel (LB1686; NRHE NN06SW 29), which incorporates two 18th century cottages.

The NRHE identifies four non-designated assets at Ardgour; the disused Corran of Ardgour pier (NN06SW 13); the west slipway (NN06SW 11); a pair of late 19th century cottages (NN06SW 32)(including the ferry office) and the surviving concrete foundation remains of a first World War royal marine battery (NN06SW 35). The Corran of Ardgour pier (NN06SW 13) was built by Thomas Telford.

The possible loss of the vessel (NRHE NN06NW 8004), known as Backwash, is recorded at the existing Ardgour slipway.

One non-designated heritage asset is recorded within the core study area at Nether Lochaber; the existing slipway (NRHE NN06SW 12). In addition, the location of a walkover survey undertaken in 2020 are recorded by the NRHE (NRHE NN06SW 50.00 & 51.00) as indicated by two points; one within the northern portion of the Nether Lochaber core study area and one immediately south. The walkover survey recorded the remains of a dwelling structure and a scooped settlement however, the grid references recorded for those assets are located outwith the 1km study area (Lewis, 2021).

A Category B Listed Building (LB1688); composed of two elements Ardgour Parish Church (NRHE NN06SW 8) and associated churchyard (NRHE NN06SW 8.01), is located within the north-western portion of the 1km study area. The Church was constructed in the early 19th century and has a north-east facing principal elevation.

Historic records and previous archaeological surveys have identified three prehistoric assets (two cists (NN06SW 4 & NN06SW 5) and a cairn (NN06SW 7)), a 12th century coin hoard (NN06SW 6) and numerous later residential, funerary, administrative and educational structures within the 1km study area.

The Ordnance Survey map published in 1874-5 depicts the route of the Corran Ferry. Corran Light House, a flag staff, a collection of buildings to the west of two piers and to the east of a lochan are illustrated in what is now Ardgour. Corran Inn, a pier, a roughly north-south aligned road and a roofed building are annotated on the Nether Lochaber side of the Corran Narrows. The foundation remains of the roofed building within a plot of land as depicted on the historic Ordnance Survey map has been identified within the woodland north of Corran (Figure 17.2.1).

Figure 17.2.1: Foundation Remains of a Roofed Building North of Corran

The Inventory Garden and Designed Landscape known as Ardgour House (GDL00020) extends into the western portion of the 1km study area and was developed from the 18th century around the Category B Listed Ardgour House (LB1687).

There are no World Heritage Sites, Scheduled Monuments, Category A Listed Buildings, Inventoried Battlefields or Conservation Areas within 1km of the CFIIS location.

There is one Scheduled Monument, Onich, fort, Ballachulish (SM2894/ NN06SW 2) to the south-east of the scheme within the 2km study area. The Scheduled Fort, typified by the NRHE as a dun, is set on a south-west facing slope commanding extensive views down Loch Linnhe.

The Category B Listed Walled Garden at Cuilcheanna House (LN7076) is located to the south of Corran in the 2km study area and was built in the 19th century.

17.2.3 Marine Features/Wrecks

Within the 1km study area, Canmore Maritime records the loss or wreck of at least fifteen 19th and 20th century vessels. There are no known finds or remains relating to submerged prehistoric landscapes within the core study area or within the 1km study area.

The nature of the wrecking process means that the position of wrecking of a marine craft or ship is often an approximate position. This is especially true in periods prior to the 20th century and the development of modern navigational systems that allow for more accurate positions of ships and craft to be charted. Ships or marine craft that have been wrecked may also not sink straight away; they may shift with the tides and weather conditions before finally coming to rest on the seabed; elements of the wreck may be scattered over several locations on the seabed with wreckage coming ashore in the inter-tidal zone. Therefore, there is a degree of uncertainty as to whether wrecks with unknown or approximate positions of wrecking may have their final wreck sites within a specific area, in this case the Corran Narrows. Furthermore, where wrecks have tentative locations, the NRHE tends to assign the record of their loss to the lower left corner of a 1km OS grid square.

As a number of wrecks within the 5km study area have locations that are tentative, this raises the possibility that their actual site(s) of wrecking may be close to or within the core study area. Notes associated with some wrecks reference Corran Ferry and Loch Linnhe suggesting a geographical proximity to the CFIIS, although the exact location of each wreck is not well documented.

17.3 Potential Construction Impacts

The CFIIS is in the vicinity of a number of listed buildings as described in Section 17.2: Baseline. Hence, depending on the nature and detail of the works, there is the potential for adverse effects on the Listed Buildings and their settings.

There is the potential for minor infrastructure to be installed in the yard of the non-designated Corran Ferry cottages (NN06SW 32) at Ardgour (i.e. the ferry office). However, as no changes will be made to the building itself, no adverse impacts on any surviving historic architectural remains are expected.

The CFIIS layout has been designed to date to avoid non-designated heritage assets are far as practicable, minimising direct impacts which may result in a reduction in their cultural heritage value. However, the foundation remains of the roofed building north of Corran are within the proposed footprint of the new marshalling area and hence, the scheme will directly impact this feature. Where non-designated heritage assets are impacted by the CFIIS, mitigation to ensure their preservation by record will be undertaken.

There are a number of historic marine wrecks recorded within the 5km study area, including at least one associated with the Ardgour slipway. The dates of these potential wrecks indicate the vessels were wooden, and hence, it is unlikely any material of historic or cultural value remains. Similarly, the strong currents, shallow sediment and steep seabed bathymetry of the Corran Narrows would suggest archaeological remnants would have been washed into the deeper channel or transported away over time. There remains however, low potential that dredging works and marine construction works of the CFIIS could impact unknown remains of wrecks surviving on the seabed.

Similarly, there is the potential that both terrestrial and marine hitherto unknown remains survive within core study area, for which there is the potential for the CFIIS to have an adverse effect on any such surviving remains.

17.4 Potential Operational Impacts

Potential operational effects associated with the CFIIS are largely limited to the scheme's impact on the setting of designated heritage assets within 2km of the development.

Due to the nature of the scheme, and the nature of the setting of the heritage assets within close proximity (i.e., within coastal villages on the route of a ferry crossing), it is considered that significant adverse effects on the settings of heritage assets would be unlikely. However, this will be considered in detail as part of the EIA (See Section 17.5).

17.5 Proposed Impact Assessment

Due to the potential for direct impacts and impacts on setting from the CFIIS, it is proposed archaeology and cultural heritage is **scoped in** to the EIA. The EIAR chapter will fully describe the baseline historic environment conditions and will assess the potential for adverse effects upon archaeology and cultural heritage.

The EIA baseline data will be collated from the following sources:

- The National Record for the Historic Environment (NRHE) as held by HES;
- The Historic Environment Record as supplied by THC;
- National Library of Scotland for published historic and Ordnance Survey maps;

- National Collection of Aerial Photography (NCAP) as held by HES for vertical and oblique aerial photographs;
- Jim Bone Collection of Aerial Photography;
- Published archival sources;
- Scottish Palaeoecological Archive Database (SPAD) for information regarding the palaeoecological and paleoenvironmental potential of the Site and surrounding landscape;
- Historic Land-Use Assessment Data for Scotland (HLAMap);
- UKHO Marine Data Portal;
- Site LIDAR. Note No LiDAR data and imagery held by the Scottish Remote Sensing Portal is available for the study area(s);
- A walkover survey of the site (including all areas within the scoping boundary, including locations proposed for the construction compounds); and
- A setting assessment visit to designated assets and informed, where relevant, by ZTVs and/or appropriate visualisations (see Section 16).

The assessment will consider both the potential for direct impacts upon heritage assets, including buried or submerged archaeological remains, and the potential for impacts upon the setting of designated heritage assets within the surrounding area. In order to do so, the assessment will establish:

- The significance of heritage assets in question;
- The sensitivity of those assets to changes (either direct physical change or to changes to their settings);
- The magnitude of impacts;
- The level of effect and whether or not that effect is considered significant in EIA terms; and
- Impacts upon integrity of setting where Scheduled Monuments are concerned, in line with Policy 7h(ii), 46) of NPF4 (Scottish government, 2023).

The setting assessment will be undertaken with reference to NPF4 and HES' Managing Change Guidance on setting, and will aim to establish the current setting of the identified heritage assets, how that setting contributes to the understanding, appreciation and experience of those assets and how the Proposed Development could impact upon this.

In terms of effects upon the setting of heritage assets, it is considered that only those effects identified as 'significant' in the assessment will have the potential to significantly adversely impact integrity of setting. Where no significant effect is found it is considered that the integrity of an asset's setting will remain intact.

Where significant effects are found, a detailed assessment of adverse impact upon integrity of setting will be undertaken. The assessment of adverse impact upon the integrity of an asset's setting, where required, will be a qualitative one.

The following matters are proposed to be scoped out of the EIA:

- Direct impacts on cultural heritage assets outwith the scoping boundary will be scoped out of the assessment, as no direct impacts are expected;

- Impacts on the settings of non-designated cultural heritage assets and features as these assets are generally considered less sensitive to changes in their settings and are judged to be unlikely to be subject to significant settings effects; and
- Impacts on the settings of heritage assets beyond 2km of the core study area as depicted in Drawing 01/27114/Sco/01/01.

Table 17.5.1: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Direct impacts on terrestrial and marine cultural heritage assets (designated and non-designated) within the scoping boundary.	In	In
Impacts on the settings of designated cultural heritage assets, features within the 2km study area.	In	In
Direct impacts on cultural heritage assets outwith the scoping boundary.	Out	Out
Impacts on the settings of non-designated cultural heritage assets and features.	Out	Out
Impacts on the settings of heritage assets beyond 2km of the score study area.	Out	Out

18 Traffic, Transport and Access

The focus of this section is the potential impacts on the surrounding transport networks during construction and operation of the proposed CFIIS. Note, marine traffic, transport and access is considered in Section 19: Navigation, and potential noise impacts associated with CFIIS traffic are considered in Section 6: In-Air Noise and Vibration.

A separate scoping exercise was undertaken as part of the supporting Transport Assessment and the traffic surveys were agreed with The Highland Council (THC) (Infrastructure, Environment and Economy) and Transport Scotland. The Transport Assessment Scoping Report is provided in Appendix 6.

18.1 Policy, Guidance and Resources

Policy relevant to traffic, transport and access associated with Corran Ferry Infrastructure Improvement Scheme (CFIIS) includes:

- HITRANS Regional Transport Strategy (Updated) (HITRANS, 2018); and
- National Planning Framework 4 (Scottish Government, 2023).

The following guidance documents have been utilised in this section:

- IEMA Environmental Assessment of Traffic and Movement (IEMA, 2023);
- IEMA Guidelines for Environmental Impact Assessment (IEMA, 2005);
- IEMA Guidelines for the Environmental Assessment of Road Traffic (IEMA, 1993);
- Design Manual for Roads & Bridges (DMRB), LA 104 Environmental Assessment and Monitoring (Revision 1) from Highways England, Transport Scotland, Welsh Government & Department for Infrastructure (2020);
- Transport Scotland's Transport Assessment Guidance (Transport Scotland, 2012);

- THC's Roads and Transport Guidelines for New Developments (The Highland Council, 2013); and
- Planning Advice Note (PAN) 75: Planning for Transport (Scottish Government, 2005).

18.2 Baseline

The following baseline information has been collated from an initial desk based review to inform the scoping exercise.

18.2.1 Ferry Operations

The Corran Ferry service operates 361 days of the year and carries over 270,000 cars each year. The timetabled service, which changes seasonally, includes scheduled crossings every 20 to 30 minutes, from early morning to late at night. However, during busy periods, the service will effectively run a shuttle service, making more frequent crossings to relieve traffic congestion in the marshalling areas. The crossing takes about 5 minutes.

During periods when the Corran Ferry is not operating, there is still a road route connection between Ardgour and the Corran settlement via Fort William. However, this road route is approximately 40 miles and includes a bridge with a 3.6m height restriction at Loch Eil.

18.2.2 Traffic and Roads

On the Nether Lochaber side, access to the existing slipway in Corran is from the A861 via a priority junction with the A82 trunk road. On the Ardgour side, the slipway to Corran Ferry is accessed from the A861.

The A82 forms part of the trunk road network and comprises a two-way single carriageway road. It provides connections from Glasgow to Inverness via Fort William and is mainly subject to the national speed limit, which reduces when travelling through towns and villages. The section of the A82 that transits past Corran has a speed limit of 50 mph between Onich and Fort William. The A82 appears to be in generally good condition and is managed by BEAR Scotland, on behalf of Transport Scotland.

Through the settlement of Corran, the A861 comprises a two-way single carriageway road with three marshalling lanes which are located beside the south-west bound lane (refer Section 18.2.3 for details).

On the Ardgour side, the A861 comprises a two-way single carriageway road to the south of the existing slipway and a single track with passing places to the north of the slipway. Within Ardgour, the A861 is subject to a speed limit of 30 mph which increases to the national speed limit when leaving Ardgour. The A861 appears to be mainly in good condition and is maintained by THC.

18.2.3 Ferry Access and Marshalling

In Corran, cars in effect use the A861 for marshalling, with the queue starting adjacent to the existing toilet block. Additional marshalling space in the form of three marshalling lanes is provided near the junction with the A82. A total of 172m is provided for ferry vehicle queueing in Corran including formal marshalling land and pre-lane space. Traffic queueing in excess of the formal marshalling area has a further 20m of A861 carriageway before directly impacting the A82 trunk road. Queueing traffic is known to occasionally back up onto the A861 at Ardgour in particular, i.e., during the Summer or bank holiday weekends.

On the Ardgour side of the crossing, there are three marshalling lanes that are accessed directly from the A861. Formal marshalling also consists of approximately 170 lane metres. There is also an approximately 120m² area which is 'boxed out' adjacent to the A861 and is generally used for larger vehicles queueing for the ferry crossing. Traffic queueing in excess of the formal marshalling directly impacts the A861.

18.2.4 Active Travel Network

The National Cycle Network (NCN) Route 78 utilises the Corran Ferry service to maintain network connection. NCN Route 78 is located along the shared path, beside the A82, to the south of the Corran Ferry Junction bus stop (Sustrans, 2024). The NCN Route 78 then connects to the Corran existing slipway via a traffic-free shared path between the A82 and the A861. NCN Route 78 recommences on the opposite side of the Corran Narrows in Ardgour, along the A861, continuing northbound.

NCN Route 78 comprises The Caledonian Way which is 378 km in length and runs from Campbeltown to Inverness. The small, approximately 200m, section of NCN Route 78 along the traffic-free path and the A861 in Corran is also a designated core path (THC, 2024).

18.2.5 Public Transport

On the Nether Lochaber side, three bus stops are located within 400m of the Corran Ferry slipway. Two bus stops are located south of the existing junction to the Corran Ferry infrastructure and comprise bus shelters with flagpole and timetable information. There is also a bus stop for routes to and from the western peninsula at the Information Point beside the slipway.

On the Ardgour side, a school bus service is available during the school term from Corran Gardens, approximately 250 m north-west of the existing Ardgour slipway. A bus shelter is provided at Corran Gardens for school bus users.

18.2.6 Accidents and Incidents

A review of Crashmap (2024) indicates that there were no recorded personal injury accidents recorded along the A861, in Corran, Ardgour or surrounds between 2018 and 2022 (2022 being the most recently available information on the website, at the time of writing).

Accident information for a section of the A82 in proximity to the A861/A82 Corran junction (between Keppanach and Corrychurrachan) was obtained from Transport Scotland for the most recently available five year period, between 2019 and 2024. The review found that a total of six accidents were recorded within the Study Area over the five year period of which one was recorded as moderately serious, one as less serious and four as slight. A total of four of the recorded accidents were recorded within approximately 100m to the north of the A861/A82 priority junction leading to the existing Corran slipway.

18.2.7 Receptor Summary

In terms of traffic and transport impacts, the receptors are the users of the road network in the vicinity of the CFIIS and the locations through which those roads pass. The following sensitive receptors have been identified following the initial desktop review:

- A861 Road Users;
- A82 Road Users;

- Ferry Users;
- Corran Residents (Nether Lochaber side);
- Corran Residents (Ardgour side);
- Core Paths; and
- National Cycle Network.

It should be noted that the above list of receptors is not exhaustive and further receptors may be identified during the EIA.

18.3 Potential Construction Effects

Potential effects associated with traffic, transport and access may be experienced by road users and local residents during the construction phase of the CFIIS. Temporary increases in traffic volume occur due to the delivery of materials, staff commuting and the movements of construction plant and vehicles. Construction works and associated traffic management on the road network, primarily the A82 and A861 (on both the Ardgour and Nether Lochaber sides), may impact the use of these roads. Construction effects on traffic, transport and access are expected to be temporary, and may be felt in different locations as the project construction progresses.

In accordance with the IEMA guidelines, potential effects of increased traffic to road users and local residents during the peak construction month will be assessed in relation to the following:

- Severance – refers to when transport infrastructure or motorised traffic divides space and people in communities. This may involve an increase or reduction in severance effects;
- Driver delay – may involve an increase or reduction;
- Pedestrian delay – may involve an increase or reduction in delays to pedestrians, wheelers and other non-motorised users;
- Non-motorised user amenity – the ability for pedestrians, wheelers and other non-motorised users to access the services, facilities and amenities of an area;
- Fear and intimidation – may be experienced by road users and residents resulting from increases in traffic flow;
- Road safety – may involve an increase or reduction;
- Road Safety Audits – applicable to the existing and new junction on the Nether Lochaber side; and
- Large loads – for any abnormal indivisible loads.

These effects and considerations will be screened for consideration during the impact assessment process as discussed in Section 18.5.

18.4 Potential Operational Effects

Once operational, access to the ferry infrastructure on the Nether Lochaber side will be via a new junction with the A82 and a new access road, leading into the marshalling area which has an increased vehicle capacity compared to the existing situation. The aim of this design, in line with the project requirement outlined in Section 2.4, is to ensure that the marshalling area can accommodate the expected increases in the volumes of ferry traffic in the future. Public transport accesses and active travel have also been incorporated into the design, including retaining NCN Route 78 connection to the Corran Ferry.

Operational changes on the Ardgour side will be much less than those on the Nether Lochaber side, as the majority of the existing arrangements will continue to be utilised. The CFIIS will result in changes to vehicle movements associated with access to the new slipway and overnight berthing structure, and potentially a change to access arrangements to the existing slipway at Ardgour.

As per the construction phase, the potential effects of increased traffic to road users and local residents will be assessed in relation to the following during the operational phase of the CFIIS:

- Severance;
- Driver delay;
- Pedestrian delay;
- Non-motorised user amenity;
- Fear and intimidation;
- Road safety;
- Road Safety Audits; and
- Large loads.

To ensure the CFIIS provides the intended improvements to traffic, transport and access, the above aspects will be screened for consideration within the EIA as discussed in Section 18.5.

18.5 Proposed Impact Assessment

The impact assessment for effects listed in Section 18.3 will be informed by detailed design, construction phasing, delivery strategies and other aspects of the CFIIS not fully defined at the time of Scoping. As such, it is proposed impacts on Traffic, Transport and Access be **scoped in** to the CFIIS EIAR for both construction and operational phases.

The Traffic, Transport and Access Chapter of the EIAR will consider likely significant effects on receptors along the transport routes in a proposed Study Area resulting from vehicle movements associated with the CFIIS. The Chapter will discuss the effects and considerations of Sections 18.3 and 18.4 and will be supported by a Transport Assessment report.

18.5.1 Study Area

The Study Area for the Traffic, Transport and Access Chapter of the EIAR will include the road network that will be used for import of raw materials, construction staff commuting and the users of the ferry services to the development site. The Study Area is therefore proposed to include:

On the Nether Lochaber side:

- A82, between Keppanach and Corrychurrachan;
- A861, between A82 and Corran Ferry slipway; and

On the Ardgour side:

- A861, between Clovullin and Ardgour Parish Church.

18.5.2 Traffic Survey

Baseline traffic flow data for the A82 and A861 will be obtained from new Automatic Traffic Count surveys completed in 2024. Baseline turning movements will be obtained from turning count surveys at the following locations:

On the Nether Lochaber side:

- A82 / A861 priority junction;

On the Ardgour side:

- A861 / access to Ardour marshalling area: and
- A861 / junction at the existing Ardgour slipway.

18.5.3 Transport Assessment

As agreed with THC and Transport Scotland during the scoping of the Transport Assessment, construction traffic movements on the public roads associated with the construction phase will be based on the proposed development design. Traffic generation will take into account the import of construction materials and the movement of equipment, construction plant and labour required. The distribution of construction related trips will be based on the location of material suppliers.

The operational assessment will be based upon traffic generation estimates derived from information received from THC. The distribution of operational trips will be based on the observed ratio of movements calculated from the turning count surveys.

Peak traffic flows will be identified to assess a worst case scenario for the construction and operational phases.

The following rules taken from the relevant guidance outlined in Section 18.1 will be used as a screening process to define the scale and extent of the assessment:

- Rule 1: Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and
- Rule 2: Include highway links of high sensitivity where traffic flows have increased by 10% or more.

Increases below these thresholds are generally considered to be insignificant given that daily variations in background traffic flow may fluctuate by this amount. Changes in traffic flow below this level predicted as a consequence of the CFIIS will therefore be assumed to result in no discernible environmental impact and as such no further consideration will be given to the associated environment effects listed in Sections 18.3 and 18.4).

The estimated traffic generation of the CFIIS will be compared with baseline traffic flows, obtained from existing traffic survey data, in order to determine the percentage increase in traffic.

Potentially significant environmental effects will then be assessed where the thresholds as defined above are exceeded. Suitable mitigation measures will be proposed, where appropriate.

Committed development traffic, i.e. those from proposals with planning consent, will be included in baseline traffic flows, where traffic data for these schemes is considered significant and is publicly available. Developments that are proposed or at Scoping will not be included.

A review of the online planning portal will be undertaken to identify any relevant committed developments.

Standard mitigation measures that are likely to be included in the assessment include:

- Production of an outline Construction Traffic Management Plan (CTMP);
- The design of suitable access arrangements with full consideration given to the road safety of all road users; and
- A Construction Staff Travel Plan.

Additional mitigation measures to minimise adverse impacts will be identified and discussed in the EIAR.

A summary of scoping outcomes for the Traffic, Transport and Access topic is presented in Table 18.5.1.

Table 18.5.1: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Traffic, Transport and Access Effects on Road Users and Local Residents	In	In

19 Navigation

The focus of this section is the potential impacts of the proposed CFIIS on vessel navigation, during both the construction and operations phases.

19.1 Legislation, Policy and Guidance

Relevant legislation applicable to the Corran Ferry service and CFIIS includes:

- International Regulations for Preventing Collisions at Sea as amended (International Maritime Organization, 1972); and
- The Merchant Shipping (Distress Signals and Prevention of Collisions) Regulations 1996.

The NMP has a section on Shipping, Ports, Harbours and Ferries, with policies relevant to the proposed CFIIS (Scottish Government, 2015a) including:

- **TRANSPORT 1**: Navigational safety in relevant areas used by shipping now and in the future will be protected, adhering to the rights of innocent passage and freedom of navigation contained in UN Convention on the Law of the Sea (UNCLOS); and
- **TRANSPORT 3:** Ferry routes and maritime transport to island and remote mainland areas provide essential connections and should be safeguarded from inappropriate marine development and use that would significantly interfere with their operation. Developments will not be consented where they will unacceptably interfere with lifeline ferry services.
- **TRANSPORT 6:** Marine planners and decision makers and developers should ensure displacement of shipping is avoided where possible to mitigate against potential

increased journey lengths (and associated fuel costs, emissions and impact on journey frequency) and potential impacts on other users and ecologically sensitive areas.

The UK Port Marine Safety Code (UK Government, 2016) sets out a national standard for every aspect of port marine safety. Its aim is to enhance safety for everyone who uses or works in the UK port marine environment. The Code is applicable to statutory harbour authorities and other marine facilities which may not have statutory powers, and as such it is intended to be flexible enough that any size or type of harbour or marine facility will be able to apply its principles in a way that is appropriate and proportionate to local requirements. The Code states that it is strongly recommended that organisations or facilities which are not a statutory harbour authority, such as marine berths and terminals, seek a proportionate compliance with this Code. This may be through the adoption of a formal risk assessment process and the implementation of a marine safety management system which complies with this Code or any alternative, similar standard applicable to their sector.

19.2 Baseline

The baseline conditions with regard to navigation have been compiled from desk-based research and personal communications with THC's ferry operations team.

Loch Linnhe is part of the navigational channel that, linked by the Caledonian Canal, forms a passage through northern Scotland from one side of the country to the other, for both leisure and commercial vessels. The restricted nature of the loch, and especially the Corran Narrows, brings all types and sizes of vessels into relatively close proximity and care is needed to avoid an incident. Loch Linnhe is classed as 'unregulated waters' in that marine traffic is able to navigate the waters of the Loch without being subject to the control of a Harbour Authority. Vessels on the loch are subject to the normal rules and regulations that apply to vessels at sea and each vessel has the responsibility to navigate safely and avoid collisions.

19.2.1 Navigational Features

In respect of aids to navigation, NLB own and operate the Corran Point Lighthouse at Ardgour. The lighthouse was one of the first in Britain to become automatic in 1898 (NLB, 2024), and is now operated remotely by NLB. A White/Red/Green sector light shines both up and down Loch Linnhe and works in conjunction with two Precision Directional Lights installed either side of the Narrows (Corran Narrows NE and Rubha Cuil-Cheanna). The location of the navigation channel (in yellow) and Corran Point Lighthouse (by the blue arrow) is shown in Figure 19.2.1

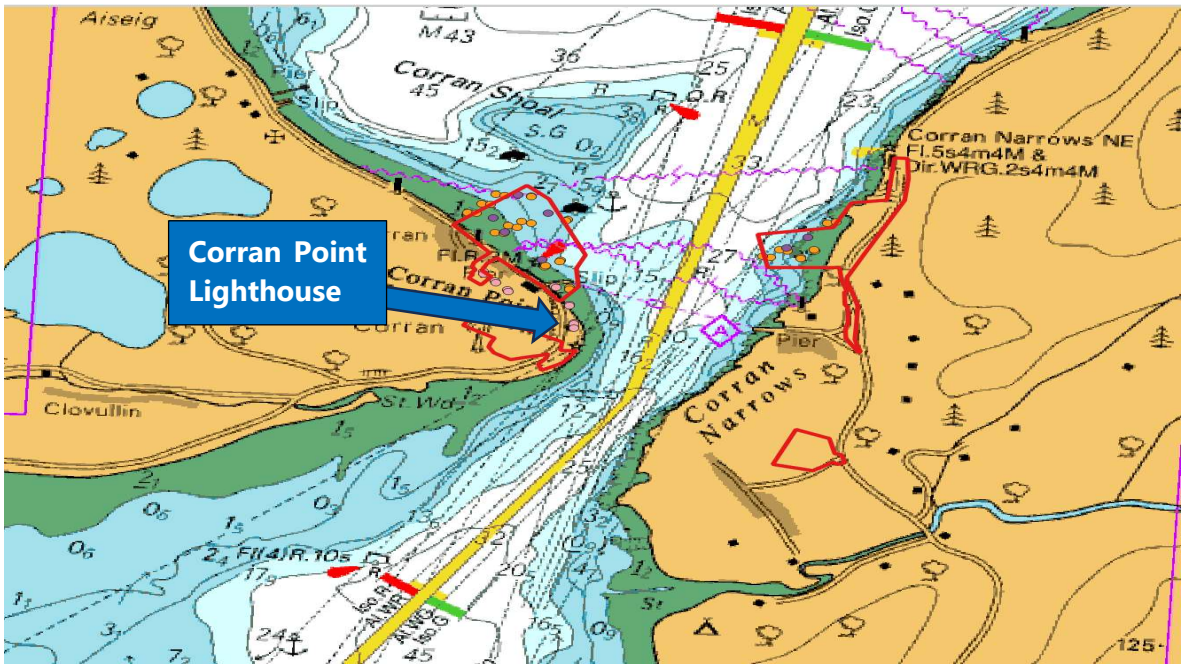

Figure 19.2.1: Navigation at Corran Narrows and Location of Corran Point Lighthouse. Raster data source: EMAPSITE (EMAPSITE, 2022)

19.2.2 The Corran Ferry

As described in Section 2.2, the Corran Ferry service provides an essential connection for the western peninsular communities to and from Lochaber, as well as for those on the Isle of Mull via the Fishnish – Lochaline route. The existing ferry service runs an approximately 420m crossing between the Ardgour and Corran (see Figure 2.1.2) with the crossing taking about 5 minutes. The service operates from early morning to late at night, 361 days of the year. The timetabled service includes scheduled crossings every 20 to 30 minutes. However, during busy periods, the service will effectively run a shuttle service.

The service is owned and operated by THC ferry operations team. Safety and operations protocols are outlined in Ferry Operations Manuals and Safety Management Systems for each vessel in operation. These documents outline all elements of operational safety, including protocols of navigation and management of navigational risks. Safety protocols also give consideration to conditions (i.e., environmental) which may result in the temporary suspension of the ferry service. Operational risk assessments are also utilised where required.

The Code of Practice for Safe Navigation in Upper Loch Linnhe (THC, 2005) is the primary navigational code for vessels in upper Loch Linnhe. The Code specifically dictates:

- *'Vessels must call up Corran Ferry, Corran Narrows before approaching and passing through the Narrows.'*

Communication with other vessels is conducted using standard radio protocols and other practices in accordance with International Regulations for Preventing Collisions at Sea (International Maritime Organization, 1972).

Currently, the ferry crew access the vessels on swing moorings, which requires transfer via a small boat. This is an outdated practice and a known maritime safety risk. The small boat is moored alongside the small existing pier at Ardgour when not in use. This pier is utilised solely by the Corran Ferry operations team for this purpose.

19.2.3 Other Loch Users

As well as the Corran Ferry, the types of vessels typically using Loch Linnhe are cruise liners, coastal cargo vessels, leisure craft, ferries, fishing boats, aquaculture and various other miscellaneous vessels (THC, 2016b). North of the Corran Narrows, there are berthing and mooring facilities at Fort William and cargo and haulage associated with piers at Corpach.

As mentioned in Section 10.2.9, MOWI Scotland Ltd operate a number of finfish farms in Loch Linnhe. The nearest is the 'Linnhe' fish farm, located approximately 400m north-west of the CFIIS scoping boundary. Vessels accessing this fish farm do so from a MOWi-owned small pier north-west of the CFIIS. Note, the potential for socioeconomic effects on businesses operating in Loch Linnhe (unrelated to navigational effects) are considered in Section 20: Population and Socioeconomics.

19.2.4 Maritime Incidents

There are two known incidents in relation to the Corran Ferry service relating to steering issues. The most notable of these was in July 2017, where ferry steering failed causing the vessel to collide with rocks on the Nether Lochaber shoreline. The vessel was subject to 5 days of damage assessment before re-entering service (THC, 2023c).

A desk-based search for other maritime incidents in Loch Linnhe in recent years identified one incident of a cargo ship running aground at Corpach (at the northern extent of Loch Linnhe), in 2015 due to high winds (MarineLink, 2015) and one incident of a leisure yacht drifting ashore in 2017 (The Press and Journal, 2017).

No vessel-to-vessel collision incidents have been identified from publicly available sources. In 2019, the Lochaber Committee published a report assessing the potential viability of a Harbour Authority for Loch Linnhe (THC, 2016b). Within this report are consultee responses from 2016, stating that maritime operations in the loch had continued for decades with no serious incidents. It should be noted that the report concluded a Harbour Authority in Loch Linnhe would not be justified on safety grounds and would not be self-sustaining in the short to medium term, and as such, no Harbour Authority was established from these findings.

19.3 Potential Construction Effects

During the construction phase of the CFIIS, there will be additional vessel movements, mostly associated with dredging, piling and the delivery of materials (some of which may be by sea) and a change in marine infrastructure.

Potential effects may therefore include:

- Disruption to the Corran Ferry service;
- Disruption to other loch users;
- Potential for collision incidents between vessels;
- Potential for collision incidents with new infrastructure; and
- Impacts on Corran Point lighthouse.

19.3.1 Disruption to the Corran Ferry Service

The existing slipways on both sides of the Narrows will be retained for continued operations of the MV Corran and the current stand-by vessel, the MV Maid of Glencoul, during the construction phase of the CFIIS. Even during the operational phase, these slipways will be

retained for contingency operations as described in Section 3.6: Decommissioning. Construction vessels will be required to give way to the Corran Ferry and utilise standard radio communication protocols with ferry operators whenever necessary.

The majority of vessel movements for the CFIIS construction will take place north of the existing ferry route, within the Scoping boundary, though vessels will be required to transfer through the Narrows from time to time. Delivery routes by sea and landing of materials will be situated away from the existing slipways so as not to interfere with the ferry service. Subsequently, no disruption to the Corran Ferry service is envisaged due to navigational impacts.

As mentioned, the ferry crew use a small boat to access the vessels on their swing moorings, and this small boat is moored at the small, existing pier at Ardgour when not in use. Appropriate construction phasing will ensure demolition of this pier is only undertaken once alternative arrangements are in place for tie-up of the small boat (e.g., at the proposed overnight berthing structure). This is to ensure continuous safe access to, and operation of, the small boat for the ferry crew, until ferry berthing can take place on the overnight berthing structure.

19.3.2 Disruption to Other Loch Users

Construction activities and vessel movements can cause disruption to other loch users (e.g. other vessels) by causing delay or obstruction to navigational passage.

Vessel movement associated with construction works will be greatest within the CFIIS Scoping boundary, with some crossing of the Narrows anticipated. The Scoping boundary does not impinge on the navigation channel, providing a minimum of at least 90m clearance on both sides (as shown in Figure 19.2.1). As such, this navigation channel and a sufficient buffer will remain available to other loch users. Standard radio communication protocols will be utilised between other users and construction traffic as appropriate.

It is noted vessels of the MOWI fish farm may be operating in relatively close proximity to CFIIS construction activities, and therefore MOWI vessels may be transiting through the Corran Narrows. Co-operation between the project and fish farm personnel will therefore be required to avoid where possible, or minimise any adverse impacts on fish farm operations (e.g., potential for disruption or delays to vessel passage) as far as practicable. This will be supported though good communication and consultation on behalf of the project. Proposals for communication and consultation regarding the need for collaboration with the fish farm are discussed further in Section 20.5.

19.3.3 Potential for Collision Incidents Between Vessels

The construction phase of the CFIIS will introduce additional vessel traffic which can be considered as new navigational hazards. As mentioned previously, construction vessel movement will primarily be operating on either side of the Narrows within the Scoping Boundary, leaving a navigational channel of sufficient clearance through the narrows. When CFIIS activities may overlap this channel, standard radio communication protocols will be utilised to manage navigational risks. Construction vessels (including barges) will display navigational lighting in line with maritime rules and regulations.

19.3.4 Potential for Collision Incidents with New Infrastructure

Infrastructure under construction for the CFIIS will be installed within the Scoping boundary, well outwith the navigation channel. There is no known reason for vessels un-associated with the CFIIS to be transiting in close proximity to the construction footprint. Hence, the risk of non-CFIIS vessels colliding with new infrastructure is already low.

To further minimise this risk, Notices to Mariners will be issued as necessary prior to, and during the construction phase. All installations in the marine environment will be adequately marked with aids to navigation as agreed through consultation with the NLB. THC's Corran Ferry operations team will be consulted and kept updated throughout the project construction phase. As such, any effects associated with the potential for collision incidents with new infrastructure during the construction phase are not deemed to be significant.

19.3.5 Impacts on Corran Point Lighthouse

Construction lighting will be required for the CFIIS, introducing new light source potentially competing or conflicting with light sectors of the Corran Point lighthouse. Although scheme lighting will not be of a sufficient wattage to compete with light sectors, strong lighting directed down the navigational channel could cause some nuisance to vessel skippers. As part of the detailed design, construction lighting for the CFIIS will be directional and trained towards the infrastructure. Residual light spill into the seascape or navigational channel will therefore not be of a sufficient brightness to have any adverse impact on the light sectors of the Corran Point lighthouse.

19.4 Potential Operational Effects

The following effects on navigation may result from the operational phase of the CFIIS:

- Effects on the Corran Ferry service;
- Disruption to other loch users;
- Potential for collision incidents between vessels;
- Potential for collision incidents with new infrastructure; and
- Impacts on Corran Point lighthouse.

19.4.1 Effects on the Corran Ferry Service

The scheme infrastructure has been designed specifically with regard to local environmental conditions and input from the THC ferry operations team to reduce navigational challenges. As described in Section 3.1: Scheme Overview, the new scheme infrastructure and NEV will work in combination to increase service capacity and resilience. The overnight berthing structure will allow for safer crew access to and from the vessels, the breakwater will provide protection to the more exposed slipway on the Nether Lochaber side from wave, current and wind conditions and the attached alignment structure will provide vessel support in adverse current and weather conditions. The CFIIS is therefore expected to minimise the service disruption risk whilst the NEV will result in reduced risk of downtime for breakdowns and maintenance in comparison to the existing, aging vessels. Hence, the CFIIS is expected to result in beneficial effects to the Corran Ferry service. This benefit is not expected to be significant to current operations, but rather the CFIIS is a safe-guard against future scenarios of increased service outage.

19.4.2 Disruption to Other Loch Users

The vessel movements of the Corran ferry service during operations will interact with other loch users (i.e., other vessels) potentially causing disruption through delays to navigational passage. As outlined previously in Section 3.5: Operational Scenarios, no material changes to the ferry service are envisaged. The operating vessel will continue to transit between slipways across the Narrows on a timetable or in shuttle-mode at peak times. Although the proposed service route in the operational phase is expected to lengthen slightly (from approximately 420m currently to an estimated 550m) and be relocated slightly north of the existing route (approximately 150m north), this is not considered a material change and therefore, unlikely to cause significant disruption to the passage of other loch users.

19.4.3 Potential for Collision Incidents Between Vessels

In the operational phase of the CFIIS, the Corran Ferry service will still operate with frequent crossings in a very similar trajectory across the Narrows, perpendicular to the navigational channel. As mentioned previously, the ferry route is expected to lengthen slightly and be located slightly north of the existing route. Changes to the operational scenario and route are minimal, and hence not expected to result in any material increase in the risk of collision incidents between vessels.

It is recognised however, that there is a small potential additional risk to navigation when the change in service route is first introduced. Therefore, good communications, including this issue of Notices to Mariners, will be employed to adequately inform other loch users of any changes to Corran Ferry operations or routes, as required. The NEV will display appropriate navigational lighting and markers in line with maritime rules and regulations. Subsequently, the CFIIS in its operational phase will not result in any significant effects with regard to risks of vessel collisions.

19.4.4 Potential for Collision Incidents with New Infrastructure

As mentioned in Section 19.3.4 for construction effects, CFIIS infrastructure will be installed well outwith the navigation channel. Similarly, there is no known reason for vessels un-associated with the Corran Ferry service to be transiting or operating in close proximity to the infrastructure during the operational phase, and therefore the risk of other vessels colliding with new infrastructure is low.

All infrastructure in the marine environment will be adequately marked with aids to navigation as agreed through consultation with the NLB. As built drawings will be communicated to authorities for updating navigational charts. Infrastructure will also be lit appropriately for safe navigation at the overnight berthing structure and slipways with input from THC Corran Ferry operations team where required. As such, no significant effects with regard the potential for collision incidents with new infrastructure are expected.

19.4.5 Impacts on Corran Point Lighthouse

Similar to construction effects, the CFIIS permanent lighting scheme will introduce new light sources, which, if poorly directed, could cause a nuisance to vessel skippers trying to navigate the channel. Wattage of permanent scheme lighting will be less than that of construction, and similarly signalled to be directional to infrastructure. Scheme lighting will be designed and installed to meet health and safety requirements and minimise unnecessary light pollution. Any residual light spill will have negligible effects on navigational aids in Loch Linnhe.

19.5 Proposed Impact Assessment

Although no significant impacts on navigation are anticipated from either the construction or operational phases of the CFIIS, it is acknowledged that no formal navigational risk assessment has been undertaken at this stage of the project. It is therefore proposed Navigation as a topic be **scoped in** to the CFIIS EIA. Rather than present a significance assessment however, it is proposed that the EIA chapter will consider navigational effects scoped in as per Table 19.5.1 as 'risks' and identifying mitigation to reduce these risks as far as reasonably practicable.

This risk assessment will be informed by consultation with other parties, including, but not limited to:

- NLB;
- MCA;
- Royal Yachting Association;
- THC ferry operations team; and
- MOWI fish farm operations team.

The risk assessment will also capture the need for additional communications for CFIIS construction and operations to other user groups of Loch Linnhe, including, but not limited to:

- Marine tourism businesses;
- Lochaber Yacht Club;
- Glencoe Boat Club;
- GaelForce Marine, Fort William; and
- Corpach Marina.

Mitigation outlined for risks associated with the construction phase of the CFIIS will then be carried forward for project implementation via the CEMD. Mitigation (i.e., controls) determined for operational risks will be managed by THC ferry operations team.

Table 19.5.1: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Disruption to the Corran Ferry Service	In	Out
Disruption to Other Loch Users	In	Out
Potential for Collision Incidents Between Vessels	In	In
Potential for Collision Incidents with New Infrastructure	In	In
Impacts on Corran Point Lighthouse	Out	Out

20 Population and Socioeconomics

The focus of this section is the potential impacts of the proposed CFIIS development on population and socioeconomics in the local area. Consideration is given to both the construction and operational phases of the project. As discussed in Section 2.3: Project Need, the importance of resilience in the Corran Ferry service for providing transport for local communities, tourists, goods, and services to and from the Ardgour side of the Corran Narrows is one of the main drivers for the CFIIS.

20.1 Policy and Resources

The CFIIS will align to Scotland's NMP, and in particular, the following socioeconomic policies relevant to the development include:

- **GEN 2 Economic benefits**: *Sustainable development and use which provides economic benefit to Scottish communities is encouraged when consistent with the objectives and policies of this Plan*; and
- **GEN 3 Social benefits**: *Sustainable development and use which provides social benefits is encouraged when consistent with the objectives and policies of this Plan* (Scottish Government, 2015a).

The NPF4 sets out the national planning policies for Scotland. Relevant policy themes associated with the CFIIS are Energy and Rural Development.

Under the theme of 'Energy', Policy 11(c) of the NPF4 states that:

> *"Development proposals will only be supported where they maximise net economic impact, including local and community socioeconomic benefits such as employment, associated business and supply chain opportunities".*

Furthermore, under the theme of 'Rural Development', Policy 29 (a) of NPF4 states:

> *"Development proposals that contribute to the viability, sustainability and diversity of rural communities and local rural economy will be supported, including essential infrastructure".*

At a regional policy level, the HwLDP sets out West Highland and Islands priorities, in particular that by 2030, the West Highland and Islands area will be better connected; under the HwLDP Vision, better ferries, better active travel, and access to greenspace and schools is noted as priorities underpinning this. Policy 43: 'Tourism' of the HwLDP supports the contribution of tourism to the Highland Economy and details the desire to promote proposals which safeguard responsible access to areas visited by tourists, and to increase the length of peoples stay.

A range of publicly available data sources have been used for this section, including:

- National Records of Scotland for life expectancy and population data;
- Scotland's Census 2022 results;
- Office for National Statistics for employment data;
- Highland and Island Enterprise research outputs; and
- National Marine Plan Interactive (NMPi) (Scottish Government, 2024a) and South-West Coast Regional Inshore Fisheries Group.

20.2 Baseline

According to the 2022 Census, the Highlands supports a population density of 9.2 people per km^2 (Scotland's Census, 2023) which is the second lowest council area population density in Scotland. Western peninsular communities of Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Morvern and the Isle of Mull beyond are experiencing population trends that point towards an aging population (Stantec, 2022). The combined population of the peninsular communities in 2021 was 4809 (2019 Mid-Year Estimates, National Records of Scotland, 2024).

As of 2022, the region of Lochaber had a population of 23% aged 65 years and over and 16.3% children aged 0-15 years. Between 2002 and 2021, there was a 39% increase in the 65+ age group and a 10% reduction in the population under 16 years of age, whereas the population aged 16-64 years increased by only 4% (NHS Highland, 2022).

Highlands and Islands Enterprise (HIE) have suggested that this is due to limited employment opportunities on the peninsula. The requirement for younger people to move away for further and higher education means that there is often a 'brain drain'. Whilst some young people may return after they complete further/higher education, or at a later stage in working life when wider personal circumstances permit, it is more common for them not to return, or not to do so until they are reaching retirement age themselves (HIE, 2018).

In order to understand the productivity of a region, or area, Gross Value Added (GVA) is used to undertake statistical analysis. GVA is a metric used to measure the productivity (per head) contribution to an economic area or region. In GVA per head terms, Lochaber, Skye and Lochalsh, Arran and Cumbrae and Argyll and Bute are grouped together in the most recent Office for National Statistics data release. This area was in the top third of areas in Scotland in 2017, with a GVA per head of £27,614, sitting between £21,744 for the Outer Hebrides and £35,495 for the Shetland islands, comparing other island or isolated communities in the Highlands and Islands Region. (Office for National Statistics, 2024).

The top three employment sectors in Lochaber, Skye and Wester Ross in 2020 were:

- Accommodation & food services (25.0%);
- Wholesale and retail (12.8%); and
- Human health and social work (12.5%) (HIE, 2020).

The employment rate (for 16-64 recognised working age) was noted as 73% in 2020; similar to the national employment rate at the time (HIE, 2020). As noted in the Area Profile for Lochaber, Skye and Wester Ross by HIE, there is potential for exposure to the negative economic effects from both COVID-19 and Brexit in terms of employment and GVA per head (HIE, 2020), although the longer-term effects are uncertain.

20.2.1 Tourism

The tourism sector is an important part of the Lochaber economy, supporting business activities and employment opportunities across the area. Tourism is a diverse industry, with a range of subsectors such as hotels, camping sites and other provision of short stay accommodation, restaurants, bars, and recreational and cultural activities. In addition, other sectors in the local economy, for example retail and transport, benefit directly and/or indirectly from the tourism industry.

The trend across the Highland Local Authority Area is for increasing GVA for tourism businesses; £278million in 2022 up from £254million in 2008 (Scottish Tourism Observatory, 2023). In the latest data release of growth sector statistics for 2023, there were 1455 registered businesses in sustainable tourism in Highland (Scottish Government, 2024b). In 2019 the Highlands attracted 17% of all overnight trips and 13% of the total overnight tourism expenditure in Scotland, and this trend is set to continue, particularly driven by domestic tourism (VisitScotland, 2024). There are two businesses providing accommodation in Corran, The Corran Bunkhouse and The Corran serviced accommodation and one in Ardgour, The Inn at Ardgour.

Employment in the Accommodation and food services sector in Lochaber, Skye and Wester Ross (21.1%) was more than double that of the Highlands and Islands (10.0%) and Scotland (7.9%) in 2018, highlighting the importance of the tourism sector in the area (HIE, 2019). Between 2016 and 2018, the most popular activity undertaken as part of a day trip in the Highlands was to go for a meal in a restaurant, cafe, hotel, or pub establishment, followed by sightseeing on foot (VisitScotland, 2024). Food and drink establishments are found scattered across the western highland's peninsula, and further afield on Mull, catering to the tourist demand. The Inn at Ardgour and the Nomad café located in The Inn at Ardgour car park provide food and drink, and on the Nether Lochaber side of the Narrows, there are several food and drink establishments located on the A82 towards Ballachulish.

Loch Linnhe is located at the southern end of the Caledonian Canal, a route which attracts tourists on water-based activities such as boat charters, wildlife cruises, and paddle-sports. Consequently, tourism-related vessels pass through the Corran Narrows either towards Fort William, or into lower Loch Linnhe heading towards Mull and Oban. It is noted that the closest business offering boat charters or cruises are based at Fort William. There is also an active programme of cruise vessels transiting through the Corran Narrows to visit Fort William, with 17 cruise vessels scheduled for 2024 (FWMSCIC, 2024).

20.2.2 Fish Farming

A finfish farm 'Linnhe' (Site ID: FS0240), is located approximately 400m north-west of the CFIIS site. Atlantic salmon are farmed at this site, with a maximum permitted biomass of 2,500 tonnes. This site has been licenced since 1983. As discussed in Section 10.2.7, there are other fish farms in the vicinity, however, none of which are close enough to be directly affected by the development.

20.2.3 Fishing

Scotmap data from 2013, indicates that only Nephrop (Norwegian lobster) pots fishing is carried out in upper Loch Linnhe with, in the region of four boats operating. The monetary value of catches in the data block covering the Corran Narrows is very low, which would suggest that the majority of pots and associated catches are located further northeast in upper Loch Linnhe (Scottish Government, 2024a). This is as expected as Nephrops favour soft sediments, living in shallow burrows commonly in grounds with fine cohesive mud which is stable enough to support their unlined burrows (Marlin, 2008). As discussed in Section 11.2.1, the seabed in the area of the CFIIS is ether rockhead, or sands and gravels, neither of which are ideal habitat for Nephrops.

The Scotmap data shows a wider range of fishing activity is undertaken in outer Loch Linnhe including: scallop diving, nephrop trawling, nephrop, crab and lobster pots (Scottish Government, 2024a). Due to the lack of fishing activity in the vicinity of the CFIIS project, it is unlikely that there will be any interaction with the fishing sector, other than that already considered within topics such as navigation, see Section 19: Navigation. Hence, they are not considered further as a receptor in this section.

20.3 Potential Construction Impacts

The following effects on population and socioeconomics may result from the construction phase of the CFIIS:

- Creation of direct jobs;

- Creation of indirect jobs;
- Effects on the local community; and
- Effects on other businesses.

20.3.1 Direct Jobs

A range of roles requiring a variety of skills and expertise will be needed to construct the CFIIS including engineers, vessel skippers, plant operators and mechanical and electrical technicians. This will result in a temporary increase in direct employment in the area for approximately 12 to 18 months. It is anticipated that there may be up to 50 workers on site for a short duration at the peak of construction, however the number of workers on site is expected to be lower for the majority of the construction programme. These jobs may be taken up by local tradespeople or from workers relocating to the area for the duration of construction. Furthermore, there is a potential knock-on effect that employment is likely to provide training and upskilling opportunities, for example in the creation of apprenticeship positions.

The creation of direct jobs during the CFIIS construction will have a temporary positive impact on the economy, but not of a scale that is likely to be significant.

20.3.2 Indirect Jobs

It is recognised that additional direct jobs in the area may increase spending on goods and hospitality, which in turn can creation of indirect jobs, primarily associated with the service sector, such as hospitality, retail and accommodation. This is intrinsically linked to the number of workers, particularly those that may have moved to the area temporarily. Hence these indirect effects are deemed a positive. Goods and services required throughout the construction phase may be procured from local companies further adding to the potential for indirect employment creation in the area. Due to the relatively small scale and temporary nature of the construction works indirect job creation is not likely to be noticeable.

20.3.3 Effects on the Local Community

Effects on the local community may be realised through social interaction between the construction workforce and the local community, as noted in Section 21: Human Health. If a proportion of the workforce potentially moves to the area temporarily for the construction phase of CFIIS, this will include aspects such as housing, community identity and health care service provision. The impacts are expected to be non-significant due to only a proportion of the workforce likely to require temporary accommodation, and the availability of accommodation within a commutable distance to the Corran Narrows.

As those temporarily relocating to the area will be of working age and need a relatively good level of fitness to undertake construction activities, the workforce are unlikely to require extensive health care provision.

It is acknowledged that access across the Corran Narrows via the current Corran Ferry service will be maintained throughout the construction phase, enabling local communities and visitors to continue to access goods and services, and local facilities.

The construction works are located to the north of the Corran settlement and as such will have minimal effects on the local residents. On the Ardgour side, works will be carried out adjacent to the main road through the village, close to residential receptors. There are a range of potential effects on residents including dust, noise and impacts on access, although these will

be considered in the specific topics (see Sections 8, 6 and 18 respectively), there is a need to understand the in-combination effects from a social perspective.

As such, there will be no impact to the local economy or socioeconomic landscape from this aspect of the construction as the service will remain unaffected.

20.3.4 Effects on Local Businesses

20.3.4.1 Tourism

As the ferry will remain operational during the construction phase of the CFIIS is not expected to have any significant adverse effect on the tourism sector businesses in the surrounding area such as accommodation, hospitality, or activity providers. The Corran Bunkhouse and The Corran serviced accommodation, are also unlikely to be directly affected by the construction works, as construction works on the Nether Lochaber side are to the north, with only minor works proposed adjacent to the settlement of Corran.

The Inn at Ardgour, and the Nomad café (a pop-up café located in the Inn at Ardgour car park) have been identified as direct receptors during construction, due to the proximity to the works and potential for disturbance or disruption to their business. General construction activities may give rise to impacts such as dust, in-air noise, and construction traffic-related impacts (as discussed in Sections 6, 8 and 18 respectively), potentially causing a disturbance to these businesses. Although these effects will be fully considered, and mitigation identified as part of the topic specific considerations it is prudent to consideration the in-combination effects on these two local tourism businesses.

Potential impact to other tourism related businesses in the area is limited to those that require passage through the Corran Narrows by vessel, such as boat charters, cruise vessels, paddle-sports providers and wildlife cruises. Effects on these businesses relate entirely to navigational impacts which will be fully considered under navigation as detailed in Section 19: Navigation. As it is envisaged that navigational effects can be fully mitigated, it is not expected that the CFIIS construction works would be detrimental to marine tourism businesses in the area. The need for clear communications with the marine tourism industry to ensure they are aware of the project and planned activities is however recognised.

20.3.4.2 Fish Farming

The Linnhe fish farm is in close proximity to the CFIIS and is considered a direct receptor. This is due to the potential impacts during the CFIIS construction phase on the live fish in the fish farm (discussed in Section 14.3), and potential navigational issues for fish farm vessels in the vicinity of the construction works (see Section 19). The relevant effects that could impact the fish farm will be fully considered, and mitigation identified as part of the topic specific considerations, however, the in-combination effects on the fish farm also needs to be considered.

20.3.4.3 Other Businesses

Other businesses that may require commercial vessel transit through Corran Narrows to deliver products and services, such as the forestry industry. Effects on these businesses relate entirely to navigational impacts which will be fully considered under navigation including as part of the assessment of disruption to other Loch Users as detailed in Section 19: Navigation. It is envisaged that navigational effects can be mitigated, hence it is not expected that the CFIIS

construction works would be detrimental to other businesses in the area that move goods or provide services by vessel transit through the Corran Narrows. The need for clear communications with other businesses utilising the Corran Narrows to ensure they are aware of the project and planned activities is however recognised.

20.4 Potential Operational Impacts

During operations, CFIIS enables a resilient and reliable ferry service with a slight increase in capacity. The ferry upgrade primarily provides a sustainable long-term option to retain the existing transport linkage across the Corran Narrows between the local communities and for residents and visitors to the area. It ensures the vital income streams for the tourism industry and associated businesses, without losing the remote "island" feel of the peninsula. Growth in demand for the ferry service is predicted and accommodated by the CFIIS, but the CFIIS is not the reason for that growth. As such, although the CFIIS maintains resilience in the ferry service, it does not provide a positive change in socioeconomic terms as the service remains largely the same as is currently provided.

The following effects on population and socioeconomics may result from the operational phase of the CFIIS:

- Creation of direct jobs;
- Effects on the local community; and
- Effects on local businesses.

20.4.1 Direct and Indirect Jobs

The NEV ferry service is understood to require a similar number of operators as the present ferry service, and may present no, or few, additional direct jobs. Similarly, indirect jobs are unlikely to be created during the operational phase as the CFIIS enables a 'business as usual' ferry service for the longer term. As such, any associated effects to local population, local communities, or the economy of the area are recognised as negligible to no impact.

20.4.2 Social Effects on the Local Community

The CFIIS will retain access between Ardgour and Nether Lochaber for communities on either side of the Narrows by enabling the ferry service to continue, albeit as a more sustainable, reliable and resilient transport link. As such, it does not constitute a significant positive impact to the local communities by improving or adding to the existing service, rather that it enables similar level of service to be provided longer term and potential growth in demand to be accommodated. Although the CFIIS does not offer a significant enhancement or benefit to the local economy, without it, the ferry service would ultimately not be able to operate, and potentially lead to the loss of businesses and de-population of the western peninsular communities as a knock-on effect.

Once CFIIS becomes operational and the NEV arrives, the ferry service from the Nether Lochaber side will move out of the settlement of Corran. This is likely to reduce effects on local residents associated with ferry operations including reductions in traffic levels and associated noise. On the Ardgour side, the CFIIS is within the settlement, close to residential receptors. The potential effects on residents include changes to noise levels, traffic changes and views. As with construction, these effects will be considered in the specific topics (see Sections 8, 18 and 16 respectively), although there is a need to understand the in-combination effects from a social perspective.

20.4.3 Economic effects on Local Businesses

20.4.3.1 Tourism

The CFIIS enables a 'business as usual' scenario once constructed, granting businesses and service providers on either side of the Narrows a more reliable and resilient transport link for tourists, local communities, goods, and services.

Specific businesses located close to the CFIIS, maybe directly affected during the operational phase. On the Nether Lochaber side of the development, it is recognised that moving the ferry infrastructure away from the serviced accommodation may increase the amenity value for visitors staying overnight, due to a reduction in traffic movements. Accommodation providers in this location are unlikely to be reliant on passing trade, with the majority of people booking ahead. As such, these businesses will not be adversely affected by the operational stage of the CFIIS and will not be considered further.

Local businesses on the Ardgour side, in the immediate vicinity of the CFIIS, namely The Inn at Ardgour and the Nomad Café, may be affected by changes to the landscape as a result of the CFIIS ferry infrastructure, traffic movements and associated in-air noise effects as discussed in Sections 16, 18 and 6 respectively. As with the construction stage there is a need to understand the in-combination effects on these receptors.

20.4.3.2 Fish Farming

It is not expected that there will be any adverse effects to the Linnhe fish farm, once the CFIIS is operational.

20.4.3.3 Other Businesses

Once operational it is not predicted that the CFIIS or associated ferry use will cause disturbance to other loch users (see Section 19.4.2). Hence other businesses that may require commercial vessel transit through Corran Narrows will not be affected. Noting that any risks of vessel collision will be assessed for operations as detailed in Section 19.5. Hence no impact to other businesses is expected once the CFIIS is operational.

20.5 Proposed Impact Assessment

It is proposed that direct and indirect jobs are **scoped out** of the EIA for both the construction and operations phases. Any employment creation through the construction phase either directly or indirectly is recognised as short-term and non-significant in EIA terms for the local area, and as such does not require further consideration through EIA.

Potential social effects to local communities and effects to specific local businesses proposed as **scoped in** to the EIA for both construction and operational phases. This is to allow the in-combination effects resulting from the CFIIS to be considered holistically, drawing upon the findings of other topics assessments within the EIA. This approach will allow a full assessment of the socioeconomic impacts to be undertaken and a joined up approach to any proposed mitigation to be proposed.

Table 20.5: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Direct jobs	Out	Out
Indirect jobs	Out	Out
Social Effects on the local community	In	In
Economic Effects on local businesses – Tourism (Ardgour Receptors only)	In	In
Economic Effects on local businesses – Fish Farming ('Linnhe' only)	In	Out
Economic Effects on local businesses – Other Businesses	Out	NA

NA = Not applicable.

21 Human Health

As defined in the World Health Organisation's (WHO) constitution, health is a state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity (WHO, 1946). From an EIA perspective, public health is considered in terms of both potential positive and negative impacts on the health of the population. Construction site health and safety for both employees and the general public is covered under compliance with the Health and Safety at Work Act 1974 and is not considered further within an EIA.

21.1 Policy and Guidance

The IEMA guide to Effective Scoping of Human Health in EIA was issued in 2022, and this sets out a framework for considering all aspects of Human Health through the EIA scoping process. This guidance has provided the framework for this scoping assessment. No external stakeholder engagement has been carried out, as input from the NHS Highlands Health Board has not been deemed appropriate at this stage due to the nature of the project and potential effects. The Scottish Public Health Observatory (ScotPHO) website has been utilised as a source of relevant information with regards to the health of the Scottish Public (ScotPHO, 2023).

The NPF4 sets out under 'Health and Safety' Policy 23:

> *'To protect people and places from environmental harm, mitigate risks arising from safety hazards and encourage, promote and facilitate development that improves health and wellbeing.' (Scottish Government, 2023).*

The Public Health Scotland's strategic plan 2022 to 2025 (Public Health Scotland, 2022) sets out a vision that health and wellbeing is promoted. This includes supporting action across Scotland to improve life expectancy and reduce health inequalities.

In a local context, the HwLDP Vision is that:

> *'By 2030, Highland will be one of Europe's leading regions. We will have created sustainable communities, balancing population growth, economic development, and the safeguarding of the environment across the area, and have built a fairer and healthier Highlands. Access to the outdoors is important to Highland for recreation, tourism and to*

help everyone maintain a healthy lifestyle. Achieving a Healthier Highlands is possible by providing for the development of places that contribute to increasing healthy lifestyles, opportunities for quality open space provision and access to enjoy the outdoors.'

Through the facilitation of the NEV, the CFIIS aligns with this vision as it ensures a viable, resilient link between the western peninsular populations and Lochaber. Healthy lifestyles can be promoted by providing access to a range of health services in Fort William and further afield, and access to enjoy the outdoors for those communities on either side of the Corran Narrows.

21.2 Baseline

As discussed in Section 2.1, the scheme is located at the Corran Narrows, approximately 7 miles south-west of Fort William. There are two small settlements in close proximity to the development; Ardgour on the western shore of Loch Linnhe, and Corran, on the eastern shore. Scoping will consider population health influencing factors such as behavioural, social, economic and bio-physical factors for the site-specific workforce for the CFIIS, the local populations of Ardgour and Corran and the wider regional populations on either side of the Corran Narrows.

Ardgour is a small settlement of approximately 30 houses and the Inn at Ardgour. Several settlements are located across the western Ardnamurchan peninsula, and all rely on either the Corran Ferry service or an alternative 40-mile journey, partly by single track road, to access vital health and wellbeing services.

There are a range of clinical, behavioural and lifestyle risk factors which impact upon human health. A 2009 report from WHO identified five behaviours which contribute to approximately 90% of the total burden of disease in high income country populations. These are noted as tobacco use, alcohol consumption, poor diet, physical inactivity and overweight and obesity, all of which have an impact on the health and wellbeing of people living in Scotland. For example, 63% of the adult population are categorised as 'overweight including obesity' resulting in health care impacts with an estimated economic cost of £4.6 billion per year (ScotPHO, 2023). The sum of these contributing factors results in Scotland having one of the lowest life expectancies in Western Europe, with the life expectancy at birth for males being 76.6 years on average and females being 80.8 years on average (ScotPHO, 2023).

In the Highland Council area, life expectancy is slightly higher than the Scottish average at 77.6 years and 82 years for males and females respectively. The population of the Highlands was 7th highest out of 32 council areas in Scotland in 2021, with a population of at 238,060. However, the population density is joint lowest in Scotland at 9 persons per square kilometre (National Records of Scotland, 2023). Although the Highland Council area covers a vast landscape encompassing isolated rural communities as well as the vibrant, expanding city of Inverness, the population of the Highlands is expected to remain stable over the next few years with a 0.5% forecast increase between 2018 and 2028. At a more local scale, the western peninsular communities are experiencing population trends that point towards an aging population and a 'brain drain' of younger people as mentioned previously in Section 20.2.

Deprivation also has an impact on health, wellbeing, and overall life expectancy. At present, almost one in five working-age adults in Scotland live in poverty (ScotPHO, 2023). However, none of the 20% most deprived areas of Scotland are found in the rural populations on the

Ardnamurchan Peninsula or within Ardgour or Corran settlements adjacent to the CFIIS (Scottish Government, 2020b), so this is not seen as a particular health concern for the project.

Medical practises are located at Morvern and Acharacle serving the rural populations on the western peninsula. Dentist care is available in Fort William, along with the provision of Accident and Emergency services at the Belford Rural District Hospital. The city of Inverness provides specialist medical clinics at Raigmore General District Hospital, and the National Treatment Centre. The Corran Ferry is utilised to provide a vehicular access service to the health facilities described in Fort William, as an alternative to the 40-mile additional road route.

21.3 Potential Effects

The IEMA Guide to Effective Scoping of Human Health in EIA proposes a list of determinants of health to be considered in scoping and a number of steps to be undertaken to identify whether any of the determinant factors should be scoped into the EIA. In the first instance, there needs to be a source – pathway – receptor linkage to make an impact likely. Where a determinant factor is likely to occur, then the scale of the change (be it positive or negative) needs to be assessed to identify if it could be significant. In the event that a negative effect could be significant, then committed mitigation can be taken into account to determine if the effect can be scoped out. In the event of a potentially positive effect, consideration is given to whether committed enhancements are sufficient to maximise the benefits. If so, the topic can be scoped out (IEMA, 2022b). Table 21.3.1 provides a list of determinants relevant to the CFIIS, identifies if there is a likelihood of an effect, considers significance and presents the committed mitigations/enhancements to inform the scoping in or out of each determinant.

Table 21.3.1: Consideration of Potential Human Health Effects

Categories	Wider Determinants of Health	Likelihood (Source, Pathway, Receptor)	Comments	Significance (Positive or Negative)	Committed Mitigation/ Enhancements	Scoped In/ Out
Health Related Behaviours	Physical Activity	Potential during operation.	The CFIIS will facilitate active travel by encompassing cycling and walking facilities in the design, contributing to the wider encouragement of participation in physical activities as described in Section 3: Development Description.	Positive – non-significant.		Out
	Risk Taking Behaviour	None.	The development does not have any elements which are likely to give rise to any direct change in risk-taking behaviours or diet/nutrition of the population.			Out
	Diet and Nutrition	None.				Out
Social Environment	Housing	Potential during construction.	Expected increased demand for accommodation in the Fort William area due to an influx of construction workforce. This could put pressure on rental housing availability in Fort William (as the closest larger settlement) and nearby towns, however this is not considered to be a significant impact due to the scale of the rental demand and duration of the construction period.	Negative – non-significant.		Out
		Potential during operation.	It is noted that there is not understood to be an increased demand for ferry operatives over and above current levels. Hence no change to the housing demand relating to the CFIIS.	No Change		Out
	Relocation	Potential during construction.	It is recognised that there may be a temporary relocation of workforce personnel associated with the CFIIS construction phase to the Fort William population catchment. Fort William has suitable leisure and social amenities to support the size of the CFIIS construction workforce, expected to be <50 people at any time during the construction period (some of	Negative – non-significant.		Out

Categories	Wider Determinants of Health	Likelihood (Source, Pathway, Receptor)	Comments	Significance (Positive or Negative)	Committed Mitigation/ Enhancements	Scoped In/ Out
			whom will already live locally). Significant impacts are deemed unlikely due to the short term small-scale relocation into the area.			
	Open space, leisure and play	Potential during construction.	The development is not located in an area where it may impact significantly upon the availability of, or access to, open space, leisure or play facilities (e.g., the playground at Ardgour or foreshores of Corran Narrows). Operation of the Corran Ferry will continue throughout the construction phase, ensuring access to open space and/or leisure activities within the wider area is uninhibited.	Negative – non-significant.		Out
		Potential during operation.	The CFIIS facilitates the introduction of the NEV. The associated continued reliability of the ferry service will facilitate continued access in either direction for outdoor pursuits or organised leisure activities.	No Change		Out
	Transport modes, access and connections	Potential during construction.	The construction works will not affect the ability of the ferry to operate, hence connectivity will be retained. Works on the new junction onto the A82 could require local traffic management but not to an extent that it would affect access as discussed in Section 18.	Negative – non-significant	Mitigation identified as part of the Traffic, Transport and Access Assessment (see Section 18).	Out
		Potential during operation.	The scheme promotes sustainable methods of transport via cycle/footpath connectivity (including to the National Cycle Network and the bus stop) and electric-powered vessels and vehicles. The CFIIS facilitates the introduction of the NEV. The associated continued reliability of the ferry service will facilitate continued access to amenities including health	Positive – Non-Significant	Mitigation & Enhancement identified as part of the Traffic, Transport and Access	Out

Categories	Wider Determinants of Health	Likelihood (Source, Pathway, Receptor)	Comments	Significance (Positive or Negative)	Committed Mitigation/ Enhancements	Scoped In/ Out
			services, social care and education for the Ardgour community and Ardnamurchan populations.		Assessment (see Section 18).	
	Community safety	Potential during construction.	No linkage between the scheme and human health related to crime risk. Construction health and safety risks will be managed by working in accordance with the Health and Safety at Work Act 1974 to ensure risk of injury to the public is minimised. Safety measures such as security fencing and signage will be in place to exclude unauthorised people.	None		Out
		Potential during operation.	The proposed CFIIS design will reduce the safety risk of crew transfer through the provision of an overnight berthing structure, eliminating the safety risks associated with vessel-to-vessel crew transfer. The new A82 road junction provides the opportunity for improved road safety at a known hazardous junction.	Positive – non-significant.	Mitigation & Enhancement identified as part of the Traffic, Transport and Access Assessment (see Section 18).	Out
	Community identity, culture, resilience and influence	Potential during operation.	As discussed in Section 2.2, the ferry has operated on the Corran Narrows for centuries, and hence is part of the community identity. This is particularly true on the Ardgour side, as it is the main access point onto the Peninsula. Provision of a resilient ferry service leads to the increased likelihood of retaining communities and populations across the Ardnamurchan peninsula, resulting in a positive (but not significant) impact in EIA terms.	Positive – non-significant.	Mitigation & Enhancement identified as part of the LVIA (see Section 16).	Out

Categories	Wider Determinants of Health	Likelihood (Source, Pathway, Receptor)	Comments	Significance (Positive or Negative)	Committed Mitigation/ Enhancements	Scoped In/ Out
			Negative impacts on the Corran community associated with ferry traffic marshalling in the middle of the settlement, will be removed by the relocation of the ferry slipway to the north of the settlement. It is recognised that landscape and visual effects can impact upon community identity, this will be fully considered in Section 16: Landscape and Visual. Overall, the impacts on community are deemed to be positive.			
	Social participation, interaction and support	Potential during operation.	A reliable ferry service facilitated by the CFIIS will ensure ongoing connectivity to social networks, thus allowing communities from either side of the Corran Narrows to participate in community events for social engagement, and access family and/or social support networks.	No Change		Out
Economic Environment	Education and training	Potential during construction.	The CFIIS may provide opportunities for work experience placements, apprenticeships, and further training during the construction phase. This may have a positive (although not significant in EIA terms) health impact on the mental wellbeing of the local community.	Positive – non-significant.		Out
		Potential during operation.	The reliable ferry service facilitated by the CFIIS may help retain the populations on the Ardnamurchan peninsula and in turn, increase the viability of rural primary and secondary education providers. Rural populations may utilise the ferry service to attend the University of the Highlands and Islands	No Change		Out

Categories	Wider Determinants of Health	Likelihood (Source, Pathway, Receptor)	Comments	Significance (Positive or Negative)	Committed Mitigation/ Enhancements	Scoped In/ Out
			(UHI) West Highland College campus at Fort William, enhancing and retaining skills within the rural populations on the western side of the Corran Narrows. Conversely, students from Lochaber may utilise the continued ferry service to access UNI courses at the UHI college building at Strontian.			
	Employment and income	Potential during construction.	CFIIS presents local employment opportunities during construction and within the wider supply chain, as noted in Section 20: Population and Socioeconomics. This will have a positive health impact (although non-significant in EIA terms) on the mental wellbeing of the local community.	Positive – non-significant.		Out
		Potential during operation.	The new ferry service facilitated by the CFIIS is noted as requiring similar staffing numbers as the current service, hence this is considered not to impact the employment potential or income for the local community.	No Change		Out
Bio-physical Environment	Climate change mitigation and adaptation	Potential during construction.	The construction works will not change flood risks to the village of Ardgour.	No Change		Out
		Potential during operation.	One of the primary drivers of the CFIIS is to reduce carbon emissions over the lifespan of the ferry service via the introduction of an NEV. Carbon emissions for operations has been proposed to be scoped in to allow for lifecycle carbon assessment; see Section 22: Climate Change. The design of the development takes into account the likelihood of more intense and frequent extreme weather events and aims to ensure it will not	Positive – unknown significance. No Change	Design to take account of flooding and climate change as detailed in Section 11; Seabed, Coastal Processes and Flooding.	Out

Categories	Wider Determinants of Health	Likelihood (Source, Pathway, Receptor)	Comments	Significance (Positive or Negative)	Committed Mitigation/ Enhancements	Scoped In/ Out
			exacerbate the impacts of climate change on local communities.			
	Air quality	Potential during construction.	Human health impacts associated with air quality are considered in Section 8: Air Quality. Mitigation will be implemented to minimise any effects to air quality, and consequently any knock-on health implications through the exposure to dust. Hence, it does not require separate consideration.	Negative – non-significant.	Mitigation identified as part of the Air Quality Impact Assessment (see Section 8).	Out
	Water quality or availability	Potential during construction/ operation	Water quality is considered in Section 10 with no significant effects identified for either construction or operational phases, and therefore no knock-on human health implications.	Negative – non-significant.	Mitigation identified for Water Quality (see Section 10.6).	Out
	Land quality	Potential during construction/ operation.	Potential effects on geology, land and soil quality as a result of the CFIIS will not be significant, as noted in Section 9: Geology, Land and Soils. Any associated human health effects from land quality impacts are considered to be non-significant.	Negative – non-significant.	Mitigation identified for Geology, Land and Soils (see Section 9.5).	Out
	Noise and vibration	Potential during construction and operation.	The development has potential during both construction and operational activities to give rise to adverse in-air noise and vibration impacts, which can in turn have effects on human health. As in-air noise and vibration has potential to give rise to significant impacts to human health, this is proposed to be scoped in to the EIA, and addressed via a Noise Impact Assessment as discussed in Section 6: In-Air Noise and Vibration.	Negative – unknown significance.	Mitigation identified as part of the Noise Impact Assessment (see Section 6).	Out

Categories	Wider Determinants of Health	Likelihood (Source, Pathway, Receptor)	Comments	Significance (Positive or Negative)	Committed Mitigation/ Enhancements	Scoped In/ Out
	Radiation	None.	Electrical cables give rise to Electric and Magnetic Fields (EMF), however as these are undergrounded, they will be insulated from human receptors. Consequently, there will be no impact to human health.	None	All cables will be installed underground.	Out
Institutional and Built Environment	Health and social care services	Potential during construction.	The construction phase of CFIIS could give rise to a potential increase in demand due to the creation of employment, however, additional workforce will be working age and expected to be in good physical health in order to undertake construction site duties. This is therefore deemed a negligible impact to the provision of health and social care services	Negative – Negligible.		Out
	Built environment	Potential during operation.	Built facilities of the CFIIS have been designed in consideration of inclusivity and access-for-all (i.e., wheeler access where appropriate, disabled car parking bays and a changing places toilet.	Positive – non-significant.	Facilities included within the proposals, including (Changing place toilet).	Out
	Wider societal infrastructure and resources	Potential during operation.	The CFIIS will provide continuity and resilience in essential life-line services and social connectivity for isolated rural communities. The facilitation of electric-powered transport is hoped to promote future investment in local/sustainable energy generation projects and utilisation of more sustainable transport options, supporting public health and mental wellbeing.	Positive – non-significant.		Out

Categories	Wider Determinants of Health	Likelihood (Source, Pathway, Receptor)	Comments	Significance (Positive or Negative)	Committed Mitigation/ Enhancements	Scoped In/ Out
			The CFIIS layout has also been developed so as not to conflict with future council and community aspirations for a fixed link across the Corran Narrows.			

21.4 Mitigation Measures

As detailed in Table 21.3.1, mitigation and enhancements identified to minimise negative effects and maximise beneficial effects considered in other topics, such as Air Quality, will ensure the protection of human health. As such, no specific human health mitigation is required.

21.5 Proposed Impact Assessment

Through consideration of topics relevant to human health in these other sections, it is considered that sufficient assessment and mitigation will be outlined within the CFIIS EIAR to manage potential negative impacts on human health. As such, Human Heath is **scoped out** of the EIA for both CFIIS construction and operations as detailed in Table 21.5.1.

Table 21.5.1: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Impacts on Human Health	Out	Out

22 Climate Change

This section aims to identify potential environmental impacts from GHG emissions and/or savings from the construction and operational phases of the proposed scheme.

22.1 Legislation, Policy and Guidance

Scotland has its own national targets to reduce GHG emissions, which are set out in the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. This Act aims to ensure Scotland contributes appropriately to the world's efforts to deliver on the Paris Agreement. Emissions Reduction Targets includes a reduction of all GHGs to net-zero by 2045 at the latest, with interim targets for reductions of at least 56% by 2020, 75% by 2030, and 90% by 2040, as per the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019.

It is noted that the Climate Change Committee, an independent statutory body established under the Climate Change Act 2008, have since stated that continued delays to Scotland's Climate Change Plan (CPP) and further slippage in promised climate policies mean that the Climate Change Committee no longer believe that the Scottish Government will meet its statutory 2030 goal to reduce emissions by 75% (CCC, 2024). The Scottish Government have since recognised that a new CCP, with different targets within the existing legislation, is the most likely course of action.

With regards to international policy context, the UK is a signatory to a number of the United Nations Framework Convention on Climate Change agreements (UNFCCC, 2022), including:

- **The Kyoto Protocol -** transposed into the Climate Change Act 2008 (as amended), which committed the UK to achieving a net carbon account for the year 2050 to be 100 % lower than the 1990 baseline;
- **The Paris Agreement -** a legally binding international treaty agreed in 2016, that aims to limit global warming to below 2, preferably to 1.5 degrees Celsius, compared to pre-

industrial levels. It requires countries to reach global peaking of GHG emissions as soon as possible to achieve a climate neutral world by mid-century; and

- **Glasgow Climate Pact -** an agreement in which countries will intensify efforts to build climate change resilience, to curb GHG emissions and to provide the necessary finance for both.

The Scottish Government have a number of planning policies detailed in NPF4 which aim to deliver the aforementioned targets. NPF4 policies that are relevant to climate change and the proposed scheme are as follows:

- **Policy 1 – Tackling the Climate & Nature Crises:** When considering all development proposals significant weight will be given to the global climate and nature crises;
- **Policy 2 – Climate Mitigation & Adaptation:** To encourage, promote and facilitate development that minimises emissions and adapts to the current and future impacts of climate change;
- **Policy 11 - Energy:** To encourage, promote and facilitate all forms of renewable energy development onshore and offshore. This includes energy generation, storage, new and replacement transmission and distribution infrastructure and emerging low-carbon and zero emissions technologies including hydrogen and carbon capture utilisation and storage;
- **Policy 13 – Sustainable Transport:** To encourage, promote and facilitate developments that prioritise walking, wheeling, cycling and public transport for everyday travel and reduce the need to travel unsustainably; and
- **Policy 20 - Blue & Green Infrastructure:** To protect and enhance blue and green infrastructure and their networks (Scottish Government, 2023).

The Scottish Government also has general policies as part of the Scotland's National Marine Plan which are in favour of sustainable development and use of the marine environment. Relevant policies to climate change and the proposed scheme are as follows:

- **GEN 5 - Climate Change:** Marine planners and decision makers must act in the way best calculated to mitigate, and adapt to, climate change; and
- **GEN 14 - Air Quality:** Development and use of the marine environment should not result in the deterioration of air quality and should not breach any statutory air quality limits (Scottish Government, 2015a).

In the local context, HwLDP policy relevant to climate change includes:

- **Policy 67 - Renewable Energy Developments:** Renewable energy development proposals should be well related to the source of the primary renewable resources that are needed for their operation. The Council will also consider:
    - the contribution of the proposed development towards meeting renewable energy generation targets; and
    - any positive or negative effects it is likely to have on the local and national economy (THC, 2012).

The following guidance and information were used to inform this section:

- IEMA Guide: Assessing GHG Emissions and Evaluating their Significance 2nd Edition (IEMA, 2022c);

- Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation (IEMA, 2020c);
- GHG Protocol Corporate Standard (World Resources Institute, 2015); and
- Pathways to Net Zero: Using the IEMA GHG Management Hierarchy (IEMA, 2020d).

22.2 Baseline

22.2.1 Greenhouse Gas Emissions

Since the mid-1800s, the human population has actively contributed towards the release of carbon dioxide and GHGs into the air, causing global temperatures to rise and long-term changes in climate patterns. This was mainly due to burning of fossil fuels during the Industrial Revolution (Met Office, 2023). Latest statistical data available shows that in 2021, Scotland's total emissions of GHGs were estimated to be 41.6 million tonnes carbon dioxide equivalent ($MtCO_2e$) (Scottish Government, 2021). Figure 22.2.1 illustrates the trend in Scottish GHG emission between 1990-2021.

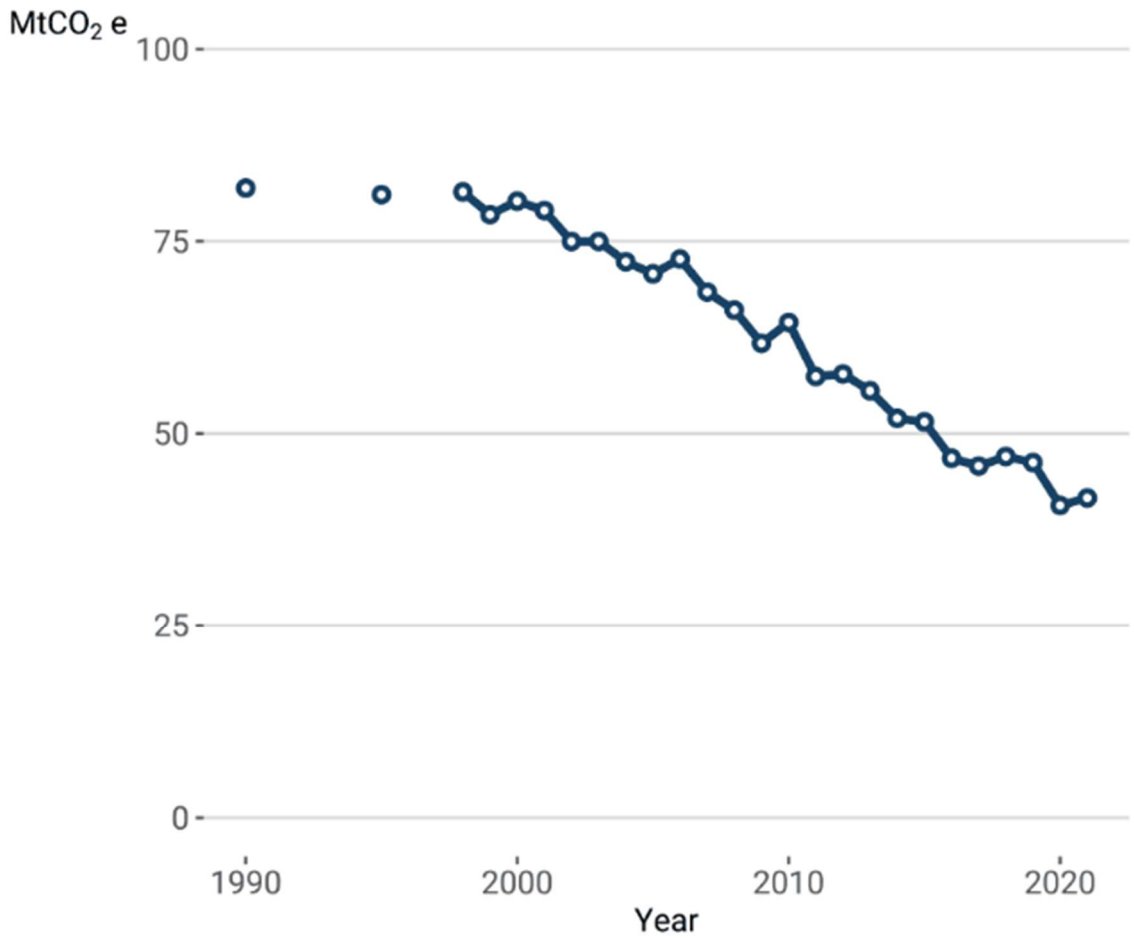

Figure 22.2.1: Scottish GHG Emissions, 1990-2021 (Scottish Government, 2021)

The Corran Ferry service currently consumes approximately 850 litres of diesel per day, or just over 310,000 litres per year. Emissions from Scottish domestic ferries, including council and private operators contribute towards 1.7% of total transport emissions which equates to less than 1% of total GHG emissions in Scotland (Transport Scotland, 2022).

22.2.2 Climate Change

As a result of carbon emissions since the start of the Industrial Revolution (1850) until 2022, the global mean temperature has increased by over 1 °C (Met Office, 2023).

It is predicted that by 2070:

- Winters will be between 1 and 4.5 °C warmer and up to 30 % wetter; and
- Summers will be between 1 and 6 °C warmer and up to 60 % drier (Met Office, 2023).

Scotland in general, has cool summers, mild winters, and rainfall throughout the year. However, in recent times, the climate has started to change as a result of global warming. Over the last few decades, Scotland has experienced a warming trend, with shifting rain patterns. It is expected that in the future, winters will be warm and wet, with summers being hot and dry (Scotland's Environment, 2023). To put this into context, Scotland has experienced 10 of its warmest years, since records began, since 1997. Furthermore, we can also expect an increase in the volume of extreme weather events, such as flooding, which may be more intense than previously experienced.

In the UK, coastal waters are also rising at rates of up to 2 millimetres (mm) per year due to climate change, and as a net result, the whole of Scotland is now experiencing sea-level rise (NatureScot, 2022b).

22.3 Potential Construction Effects

22.3.1 Greenhouse Gas Emissions

The carbon cost associated with the proposed scheme can arise from a multitude of activities, such as:

- Intrinsic carbon cost associated with raw materials – metals, concrete, wood and plastics;
- Carbon emissions as a result of vehicle and vessel movements associated with delivery of construction materials and transport for the construction workforce; and
- Carbon emissions from construction plant use.

The aforementioned impacts will be minimised, where practicable, by the reuse of material on site, for example, rock and dredge material as infill. Similarly, materials will be responsibly sourced, with consideration and preferentially utilising locally sourced materials, recycled materials over raw materials. Transport carbon emissions will be minimised by effective scheduling of construction works and material and plant delivery.

22.3.2 Climate Change

Construction activities associated with the CFIIS are not expected to contribute to an increase in extreme weather events and flooding. Extreme weather is a possibility during construction and may hamper progress of works, for example high winds can restrict the pilling works, the use of cranes and other tall plant items. In addition, high winds can generate adverse wave conditions which may impact construction activities for the marine works. The construction management team will need to consider both seasonality and weather restrictions to minimise delays where possible. Weather forecasts will be used to predict extreme weather events, to inform planning, to ensure the site is 'made safe' ready for a given event. This may involve the

stowing away or tying down of plant and equipment. Although a consideration, impacts as a result of extreme weather are unlikely to be significant to the outcome of the CFIIS or the surrounding area.

22.4 Potential Operational Effects

22.4.1 Greenhouse Gas Considerations

The following operational activities will change GHG emissions:

- Ferry operations;
- Lighting and onshore operations; and
- EV charging and active travel.

CFIIS facilitates the introduction of an NEV, which will reduce the GHG emissions associated with the operation of the ferry service over the use of diesel-powered vessels. It is acknowledged the diesel-powered MV Corran may continue to operate the ferry service in the short-medium term and as a backup vessel. Additionally, a temporary diesel generator may be utilised to charge the NEV battery system until a suitable grid connection is finalised. Ultimately, the proposed NEV will lead to lower total emissions when in use, using modern technology, efficient design and with the opportunity to be powered from the national grid which has a growing portion of renewable energy sources connected.

It is recognised that there will still be GHG emissions associated with the lighting and onshore operations of the CFIIS. Electricity will be required for the proposed EV charging units, new scheme lighting, the purser's kiosks and toilet block. Although the fossil fuel contribution to electricity provided by the national grid continues to reduce, electricity in the UK still has a GHG cost.

The proposed electric EV charging stations and connectivity to the active travel network will encourage and facilitate public use of 'greener' methods of transport. Providing facilities for electric vehicles will encourage their usage. Maintaining the connection to the active travel network will continue to encourage the use of bikes and will discourage the use of cars and other fossil fuel powered vehicles. The active travel network is discussed further in Section 18: Traffic, Transport and Access.

The CFIIS facilitates the introduction of the NEV, the vessel itself is not part of the project. However, it is recognised that there is a carbon cost associated with construction of the new vessel, but the carbon cost of a vessel, regardless of whether it is a NEV, or diesel powered, would be similar.

In summary, the operations of the CFIIS, by nature, will result in a positive effect on GHG emissions over the life to the project, as the project will encourage the use of renewable electricity over the burning of fossil fuels. Operational GHG emissions will still require further assessment within the EIA to gain a greater understanding of the overall carbon cost of the development.

22.4.2 Climate Change

The design of the development will take into consideration the likelihood of sea level rise and more intense and frequent extreme weather events, including flooding. Wave and tidal modelling that has been undertaken thus far, has taken extreme weather events into consideration, in order to inform the current design. Various elements of the scheme have been incorporated to improve ferry service resilience in adverse weather, including the introduction and locations of the alignment structures, fendering, breakwater and the overnight berthing structure. Purser kiosks also provide a benefit to staff members during adverse weather events, providing a safe shelter from the sun, rain or cold weather. Therefore, it is expected that there will be no significant adverse environmental impacts of climate change on CFIIS operations. It is recognised that there is a link between climate change and coastal processes (extreme storms) and flooding (including sea level rise), these are considered in Section 11: Seabed, Coastal Processes and Flooding.

22.5 Proposed Impact Assessment

One of the primary drivers of the CFIIS is to reduce carbon emissions over the lifespan of the ferry service through the introduction of a NEV, whilst providing infrastructure for a reliable transport service for tourists and locals alike. As such, it is proposed that GHG emissions for both the construction and operational phase are **scoped in** to the EIA to provide an in depth understanding of impacts and their significance.

It is proposed that construction and operational phase climate change impacts are **scoped out** of the CFIIS EIA. By design, the project will consider effects of climate change, namely sea level rise and an increase in intensity and frequency of extreme weather. Hence, no significant effects on the scheme are expected. However, it is recognised in Section 11: Seabed, Coastal Processes and Flooding that flooding requires further assessment, inclusive of flooding caused by climate change. A summary can be seen in Table 22.5.1.

Table 22.5.1: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
GHG Emissions	In	In
Climate change impacts	Out	Out

Carbon dioxide equivalent (CO_2e) calculations will be undertaken for all stages of the development, to allow a lifecycle carbon assessment to be undertaken in alignment with the GHG Protocol Corporate Standard (World Resources Institute, 2015). This will not consider the cost of construction of the new vessel. Where appropriate the current UK Government GHG Conversion Factors for materials and activities will be utilised (UK Government, 2023a).

23 Major Accidents and Disasters

The IEMA guidelines on Major Accidents and Disasters in EIA (IEMA, 2020e) provide the following statements which have been used in for the purpose of scoping:

- A major accidents is '*an event (for instance a train derailment or major road traffic accident), that threatens immediate or delayed serious environmental effects to human health, welfare and/or the environment and requires the use of resources beyond those of the client or its appointed representatives (i.e., contractors) to manage*';
- Major accidents can be caused by both man-made and natural hazards;
- A disaster is '*a man-made/external hazard (such as an act of terrorism) or a natural hazard (such as an earthquake) with the potential to cause an event or situation that meets the definition of a major accident'*; and
- A significant environmental effects in relation to a major accidents and/or disaster assessment '*could include the loss of life, permanent injury and/or temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration*'.

23.1 Legislation and Guidance

Various legislation is in place to as part of the governance structure of activities which could give rise to major accidents. This is to help ensure major man-made accidents do not occur. Relevant legislation is discussed as required in Section 23.3.

The guidance utilised in the production of this section is:

- Major Accidents and Disasters in EIA: A Primer - IEMA Guidelines (IEMA, 2020e).

23.2 Baseline

23.2.1 Biological Hazards

As the COVID-19 pandemic has highlighted, the spread of communicable diseases through the population can pose a high risk to people on both local and global scales. Although the Corran Ferry service provides a highly-utilised transport connection between the communities of the western peninsula and the Isle of Mull with those of Lochaber and the wider region, the communities on either side of Loch Linnhe (and beyond) are still connected by other, transport links. As such the Corran Ferry service is not identified as a notable contributor toward the spread of communicable diseases.

During the COVID-19 pandemic, the Corran Ferry service remained operational as an essential service provider. Throughout the period that government COVID-19 measures were in place, the Corran Ferry service continued to provide transport services for the local community and businesses by implementing protocols compliant with federal government guidance to ensure the health and safety of its employees and members of the public. This included a period in which passengers were not charged a fare for the ferry, so as to reduce the risk of disease transmission. No issues requiring further incident management with regards to COVID-19 arose in relation to Corran Ferry operations. There are currently no COVID-19 management measures in force in the UK (UK Government, 2023b).

Biological hazards may also be considered in terms of infestations by fungal pathogens, insects etc. There are no known occurrences or current sources identified, that could be transferred by the ferry.

23.2.2 Fire

There are no records or anecdotal evidence of fires associated with the ferries or ferry infrastructure having occurred. There are, however, flammable materials including fuels and oils stored and used on the ferries. These are appropriately managed in line with CAR and COSHH Regulations.

23.2.3 Transport and Navigation Incidents

The A861 through Ardgour, although an 'A' road, is a single carriageway from the existing ferry slipway to the south, and a single track road with passing places from the slipway to the north. The A861 has a 30 mph speed limit through Ardgour past the Inn at Ardgour and the existing ferry infrastructure.

On the Nether Lochaber side, the A82 trunk road, is a single carriageway of two-way traffic, with a 50 mph speed limit in proximity to the CFIIS scoping boundary. Hence, transport incidents in proximity to the CFIIS would be unlikely to be of a scale to be classed as major accidents due to the volume of traffic and speed of traffic flow.

As discussed previously, the A82 junction with the A861 through Corran is a known regional hotspot for traffic accidents. Six incidents have occurred in the vicinity of the A82 junction between 2017 and 2022 (refer Section 18.2.5 for further information) although none of these would have been classed as a major accident. It is noted a road traffic accident that blocks the A82, may result in lengthy diversions for traffic due to a lack of local alternative road routes.

As outlined in Section 19.2.4, only a few maritime incidents were identified in Loch Linnhe in the recent past, none of which would be considered major accidents.

23.2.4 Natural Disasters

Storm events bringing strong winds are a relatively regular occurrence in western Scotland. Whilst storm wind and wave conditions in the Corran Narrows are slightly subdued by the low lying, sheltered nature of location compared to more exposed land, the existing ferry service is particularly at the mercy of adverse weather. Hence, in considerably adverse weather conditions, the Coran Ferry service can be suspended due to safety considerations. Consequently, there is no risk of major accident occurring during storm events.

While earthquakes are occasionally recorded in Scotland, most are of a low magnitude (<2) on the Richter scale and subsequently go unnoticed by the general population. A study by Musson (2007) shows that historically, the Great Glen Fault (on which the Corran Narrows are located) appears to act as the locus for an assemblage of faults that produce minor earthquakes. However, none of these minor faults are of uniquely important status and Musson (2007) goes on to say that it would be incorrect to state that the Great Glen Fault is an "active fault" for seismic activity. The most recent record of an earthquake in Scotland was recorded as originating at Moidart, West Highland in 2017. This was classified as Light (measuring 4.0 on the Richter Scale). The most recent record of a Moderate earthquake (measuring 5.0 on the Richter Scale) was in 1901 near Inverness (British Geological Survey, 2023).

23.3 Potential Impacts

New development and/or aspects of construction and operational scenarios have the potential to vary the effects, or magnitude of effects, with regard to major accidents and disasters. A list of potential major accidents and disasters has been developed, and each is considered in terms of how the location and proposed use of the CFIIS may affect the risk of each accident/disaster scenario (see Table 23.3.1).

The IEMA (2020a) guidance in its scoping decision process flow asks the question: '*Do existing design measures or legal requirements, codes and standards adequately control the potential major accident and/or disaster, or will it be adequately covered/assessed by another topic?*' If the answer is yes, the topic can be scoped out for further consideration. Hence, Table 23.3.1 signposts to relevant sections within this document, design standards, legal requirements, codes and standards.

Table 23.3.1: Potential Major Accidents and Disasters

Major Accident or Disaster	Location Risk?	Proposed Use Risk?	Comments	Design Measures or Legal Requirements, Codes and Standards	Topic Section	Scoped in or out?
Building Collapse	No	No	Buildings associated with the CFIIS include the purser kiosks and toilet block. The unlikely event of building collapse (during the construction or operational phase) would not be classed as a major accident due to the number of people that are likely to be affected due to the small scale of the buildings.	Managed via Construction (Design and Management) Regulations 2015 (CDM Regulations), Building standards.	NA	**Scope out.**
Transport Incident: Major Road Traffic Accident	No	No	A road traffic accident on either the A82 or A861 (during the construction or operational phase) would be unlikely to be classed as major accident due to the volume of traffic and speed of flow. It is noted a road traffic accident that blocked the A82 for passing traffic may result in the largest adverse effect due to long alternative road routes, although this is still unlikely to constitute a major accident under the IEMA definition. The potential for traffic accidents and other impacts are further discussed in Section 18: Traffic, Transport and Access. The CFIIS includes the development of a new junction for vehicles accessing/leaving the new ferry service infrastructure on the Nether Lochaber side. This new junction, in the operational phase, will improve access compared to the existing junction at Corran resulting in safer traffic flow and exit/entry onto the A82.	Design Manual for Roads and Bridges (DMRB) (National Highways *et al.*, 2024).	Section 18: Traffic, Transport and Access.	**Scope out.**
Navigation Incident: Major Vessel Collision	Yes	Yes	In the unlikely event of a vessel collision in the vicinity of the Corran Narrows and CFIIS, it is highly unlikely this would be classed as a major accident. The exception could be a collision involving the Corran Ferry and/or a cruise liner due to the number of people that may be affected. As outlined in Section 19: Navigation, collision risk associated with the construction and operational phases of the CFIIS will not be significant, and the CFIIS would not exacerbate the adverse effects of any collision.	The Code of Practice for Safe Navigation in Upper Loch Linnhe (THC, 2005); International Regulations for Preventing Collisions at Sea as amended (International Maritime Organization, 1972); and THC Ferry Operations Manuals and	Section 19: Navigation.	**Scope out.**

Major Accident or Disaster	Location Risk?	Proposed Use Risk?	Comments	Design Measures or Legal Requirements, Codes and Standards	Topic Section	Scoped in or out?
			A Navigational Risk Assessment will be developed/updated to incorporate the changes resulting from the CFIIS for both construction and operational phases (refer Section 19: Navigation).	Safety Management Systems.		
Malicious Attacks/ Terrorism	No	No	There is no known reason why the CFIIS would be a target for terrorism. Furthermore, the CFIIS does not lend itself to a means of sabotage that would give rise to a major accident.	NA	NA	**Scope out.**
Biological Hazard: Epidemic / Pandemic	No	No	Construction or operations of the CFIIS is not expected to result in an increased risk of communicable diseases. The Corran Ferry service is not identified as a major contributor toward the spread of communicable diseases as there are other transport linkages between communities.	THC has management procedures in place to deal with disease outbreaks such as COVID-19 which could impact the ferry service. Where required, these are updated in line with Scottish and/or UK Government guidance.	NA	**Scope out.**
Biological Hazard: Animal/ Insect Infestation	No	No	No major sources of biological hazards have been identified in the region and the CFIIS would not exacerbate any such hazard. Risk of terrestrial and marine non-native invasive species introduction/spread has been considered in Section 13.2.1.2 in Terrestrial Ecology and Ornithology and Sections 14.1.3.3 and 14.1.4.1 in Benthic Ecology respectively.	Wildlife and Countryside Act 1981, as amended.	Section 13.2.1.2 in Terrestrial Ecology and Ornithology and Section 14.1.3.3 in Benthic Ecology.	**Scope out.**
Earthquake	Yes	No	The site of the development is situated on the Great Glen Fault, an area which historically is shown to be a locus for minor earthquakes. Earthquakes could have impacts to scheme buildings, however even in the unlikely event of building collapse, this would not be classed as a major accident due to the number of people that can use these buildings at any time (refer 'Building collapse' above).	Managed via Construction (Design and Management) Regulations 2015 (CDM Regulations), Building standards.	NA	**Scope out.**

Major Accident or Disaster	Location Risk?	Proposed Use Risk?	Comments	Design Measures or Legal Requirements, Codes and Standards	Topic Section	Scoped in or out?
			Damage to new and existing ferry infrastructure (i.e., overnight berthing structure, slipways, marshalling areas) resulting from earthquakes may result in service disruption, but would not result in events that would constitute a major accident.			
Coastal Flooding	Yes	Yes	As outlined in Section 11: Seabed, Coastal Processes and Flooding, construction activities are not expected to contribute to an increase in flooding events. The proposed CFIIS will consider flood levels by design and will be designed to not impact upon flood risk to others or exacerbate the flood risk from incidents such as by tidal locking of drainage systems during the operational phase. Land under the CFIIS is already prone to some level of coastal flooding, and creation of the land-reclamation area will technically encroach on the coastal waterbody, however the impact of this will be negligible and it is not anticipated to increase flood risk.	The CFIIS outline and detailed design has been/will be developed to minimise the effects of coastal flooding.	Section 11: Seabed, Coastal Processes and Flooding.	**Scope out.**
High Winds/ Storm	Yes	Yes	High wind speeds adversely affect the wave conditions of the Corran Narrows causing potential service disruption. Current operational protocols dictate that in truly adverse weather conditions, the Corran Ferry service does not operate. This practice will be carried forward through the construction and into the operational phases of the CFIIS. The overnight berthing structure of the CFIIS has been designed in consideration of 1 in 50 year storms to protect the vessels from damage or from being pushed off their berths the operational phase of the CFIIS.	The CFIIS outline design has been developed to minimise the effects of adverse weather conditions for vessel berthing and operation.	NA	**Scope out.**
Fire	No	Yes	There is a low risk of the construction or operational phases of the CFIIS starting or sustaining fire. Potential ignition sources and flammable materials include new electrical infrastructure (i.e., NEV charging feeder pillar and switchboards) and diesel infrastructure (i.e. generator and storage cube).	Electrical infrastructure will be designed to Construction (Design and Management) Regulations 2015 (CDM Regulations), Building standards.	Appropriate storage of materials is discussed in Section 15: Materials and Waste.	**Scope out.**

Major Accident or Disaster	Location Risk?	Proposed Use Risk?	Comments	Design Measures or Legal Requirements, Codes and Standards	Topic Section	Scoped in or out?
			Materials during construction and operational phases will be stored appropriately to minimise fire risk (refer Section 15: Materials and Waste. In the unlikely event of a fire at the development of the CFIIS, the scale of such a fire would be unlikely to constitute a major accident under the IEMA definition.	Diesel storage managed under COSHH and CAR Regulations.		

NA = Not applicable.

23.4 Proposed Impact Assessment

As the CFIIS is not expected to increase the occurrence or exacerbate the effects of major accidents or disasters, it is proposed that this topic is **scoped out** of the CFIIS EIA. Where lesser risks relating to accidents or disasters have been identified, these are considered within other topics of this report, as detailed in Table 23.3.1.

Table 23.4.1: Summary of Effects Scoping Table

Potential Impact/Effect	Phase	
	Construction	Operations
Major Accidents and Disasters	Out	Out

24 Initial Schedule of Mitigation

Table 24.1 comprises the ISoM including the mitigation measures originating in various sections of this Scoping Report. Mitigation measures in some instances are relevant to more than one topic area, where this is the case it has been highlighted in Table 24.1. The ISoM focusses on the construction phase of the project and details the mitigation which is taken account of in the scoping out of topics from the EIAR. Operational mitigation and further construction mitigation, where required, will be determined during further assessments through the EIA process, which will be included in the EIAR Schedule of Mitigation (SoM). As outlined in Section 1.2, mitigation outlined in this ISoM will be carried forward into the EIAR SoM for the CFIIS project. This will then be utilised in the production of the CEMD developed for the CFIIS.

Table 24.1: Initial Schedule of Mitigation for CFIIS Construction

Originating Section	Topic's Relevant To	Adopted Mitigation
6	• In-Air Noise and Vibration	• If required, impacts from blasting will be controlled through the setting of vibration limits, defined in consultation with the blast engineer, and governed through construction RAMS.
9	• Geology, Land and Soils	• Materials to be re-used on site where practicable.
	• Geology, Land and Soils	• Soils will be appropriately handled to ensure the structure is not degraded, including minimal movement and suitable storage to maximise reinstatement value.
	• Geology, Land and Soils	• If previously unidentified contaminated land is suspected or found on site, works in the immediate vicinity will be halted and advice sought from the Environmental Clerk of Works (ECoW) in the first instance. If the soils have already been excavated, they will be isolated from other materials while advice is sought.
	• Geology, Land and Soils	• Soil removed from temporary areas will be stored to allow it to be used as part of the site reinstatement, where practicable.
	• Geology, Land and Soils • Water Quality • Terrestrial Ecology & Ornithology • Marine Ecology	• A Pollution Incident Response Plan will be developed in alignment with GPP 22 (NIEA, DEFRA, SEPA and NRW, 2018b)
	• Geology, Land and Soils • Water Quality • Terrestrial Ecology & Ornithology • Marine Ecology	• Spill kits will be made available close to the working areas with equipment suitable for the types and quantities of materials being utilised.

Originating Section	Topic's Relevant To	Adopted Mitigation
10	• Water Quality • Marine Ecology	• Appropriate techniques to be deployed to prevent surface water run-off, potentially including the use of geotextile silt fencing, in alignment with GPP 5: Works and Maintenance in or Near Water (NIEA, DEFRA, SEPA and NRW, 2018c).
	• Water Quality • Marine Ecology	• Visual inspections will be conducted regularly during dredging, blasting and marine rock breaking activities to monitor water turbidity caused by suspended particles, engineered containment measures (e.g., a silt curtain) will be considered, if required.
13	• Terrestrial Ecology and Ornithology • Geology, Land and Soils	• A Japanese Knotweed eradication plan will be developed and implemented.
14	• Marine Ecology	• All construction vessels, including vessels under 10m in length, will adhere to the general principles in the SMWWC when undertaking their activities.
15	• Materials and Waste • Geology, Land and Soils • Water Quality • Air Quality • Terrestrial Ecology & Ornithology • Marine Ecology	• A Materials Management Plan will be implemented to detail the storage and handling requirements of materials that have a potential to affect the environment, this will align with: o CAR GBRs 26 and 28 and GPP 2 - for oil storage and refuelling; o COSHH Regulations - to ensure chemicals are appropriately stored and used taking account of specific risks; o GPP 5 and GPP 6 – for storage of soil stock piling and concrete handling;
	• Materials and Waste • Geology, Land and Soils • Water Quality • Air Quality • Terrestrial Ecology & Ornithology • Marine Ecology	• A Waste Management Plan will be produced and implemented; this will detail how: o The waste hierarchy will be implemented; o All waste which is not able to be reused will be segregated to facilitate recycling; and o Waste removed from site will be disposed of; by a licensed waste contractor in line with the waste hierarchy

25 Conclusion

Scoping Opinions are sought from THC and the MD-LOT under Regulations 17 and 14 respectively of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017, as amended, and the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017, as amended. The opinions will be used to inform the scope of the EIA that is required in support of the Planning Permission and Marine Licence applications. This report has considered all the topics that may be required for inclusion within an EIA and has proposed that a number of topics can be scoped out taking account of the mitigation proposed in Table 24.1. Table 25.1 details the topics proposed to be scoped out or included within any EIAR, for the proposed Corran Ferry Infrastructure Improvement Scheme.

Table 25.1: Summary of Topics and Effects Scoped In or Scoped Out for the CFIIS EIA Assessment

Topic	Construction	Operations
In-Air Noise and Vibration		
Noise (excluding blasting)	In	In
Vibration (excluding blasting)	In	Out
Road traffic	In	In
Blasting noise and vibration	Out	NA
Underwater Noise		
Rock stripping and potentially blasting	In	NA
Piling	In	NA
Dredging	Out	Out
Vessel movement	Out	Out
Air Quality		
Demolition dust effects on human receptors, namely Ardgour residents	Out	NA
Earthworks dust effects on human receptors	In	NA
Construction effects on human receptors	Out	NA
Trackout on human receptors and the A82	In	NA
Dust effects on ecological receptors	Out	NA
Geology, Lands and Soils		
Loss of geology and soils	Out	NA
Spread of existing contaminants	Out	NA
Degradation of soils	Out	NA
Soil contamination	Out	NA
Water Quality		
Marine		
Increase of solids in the water column	Out	Out
Pollution from a loss of containment	Out	Out
Sewage Disposal	NA	Out
Fresh Water (Watercourse)		
Increase of solids in the water column	Out	NA
Pollution from a loss of containment	Out	NA

Topic	Construction	Operations
Seabed, Coastal Processes and Flooding		
Impacts to the seabed	Out	Out
Impacts to coastal processes in the Corran Narrows	NA	In
Impacts to flood risk	NA	In
Biodiversity		
Terrestrial Ecology and Ornithology		
Habitat change	In	In
Habitat degradation	In	NA
Spread of INNS	In	NA
Disturbance	In	In
Accidental physical injury	In	In
Marine Ecology		
Benthic		
Habitat changes	In	In
Sedimentation	In	In
Spread of marine INNS	In	In
Marine Mammals		
Underwater noise	In	Out
Vessel (and construction activity) interaction	Out	Out
Injury due to dredge disposal at sea	In (if disposal to sea is required)	Out
Fish and Shellfish		
Habitat changes	Out	Out
Underwater noise effects	In	Out
Construction activity effects	Out	NA
Dredge activity interactions	Out	Out
Materials and Waste		
Consumption of materials and resources	In	Out
Materials storage and use	Out	Out
Waste management	In	Out
Landscape and Visual		
Landscape effects	Out	In
Visual effects	Out	In
Archaeology and Cultural Heritage		
Direct impacts on terrestrial and marine cultural heritage assets (designated and non-designated) within the scoping boundary	In	In
Impacts on the settings of designated cultural heritage assets, features within the 2km study area	In	In
Direct impacts on cultural heritage assets outwith the scoping boundary	Out	Out

Topic	Construction	Operations
Impacts on the settings of non-designated cultural heritage assets and features	Out	Out
Impacts on the settings of heritage assets beyond 2km of the score study area	Out	Out
Traffic, Transport and Access		
Traffic, transport and access effects on road users and local residents	In	In
Navigation		
Disruption to the Corran ferry service	In	Out
Disruption to other loch users	In	Out
Potential for collision incidents between vessels	In	In
Potential for collision incidents with new infrastructure	In	In
Impacts on Corran point lighthouse	Out	Out
Population and Socioeconomics		
Direct jobs	Out	Out
Indirect jobs	Out	Out
Social effects on the local community	In	In
Economic Effects on local businesses – Tourism (Ardgour Receptors only)	In	In
Economic Effects on local businesses – Fish Farming ('Linnhe' only)	In	Out
Economic Effects on local businesses – Other Businesses	Out	NA
Human Health		
Impacts on Human Health	Out	Out
Climate Change		
GHG emissions	In	In
Climate change impacts	Out	Out
Major Accidents and Disasters		
Major accidents and disasters	Out	Out

Key

No significant effects expected – Scoped Out	
Potential for significant effects – Scoped In	
Not Applicable	

The EIAR will be produced in line with the requirements laid out in the EIA Regulations, it will specifically include:

- A design description detailing the specifics known at the point of EIAR and highlighting any areas where refinement may occur.
- Consideration of alternatives including those presented during initial public consultation.

- Provide a sufficient description of the development including a construction method statement.
- It will present the outcome of the scoping process.
- Detain mitigation primary and tertiary mitigation taken account of during the impact assessment process.
- Present a SoM which will build upon the ISoM presented in Section 24.

It is noted that the EIA and application submissions will be supported by other documentation including but not limited to:

- Biodiversity Enhancement and Management Plan;
- HRA Supporting Documentation;
- BPEO for Dredging; and
- Transport Assessment.

The project team are committed to working with Highland Council and their design engineers to ensure the design minimises environmental effects and where this is not practicable, appropriate mitigation will be implemented.

26 Glossary

Acronym	Definition
µPa	Micro-pascal
AA	Appropriate Assessment
AQMA	Air Quality Management Areas
BAP	Biodiversity Action Plan
BBC	British Broadcasting Corporation
BPEO	Best Practicable Environmental Option
BS	British Standard
CAR	The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended)
CCP	Climate Change Plan
CD	Chart Datum
CEMD	Construction Environmental Management Document
CFIIS	Corran Ferry Infrastructure Improvement Scheme
CO_2e	Carbon Dioxide Equivalent
COSHH	Control of Substances Hazardous to Health
dB	decibels
DMRB	Design Manual for Roads and Bridges
DEFRA	Department of Environment, Food and Rural Affairs
ECoW	Environmental Clerk of Works
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMF	Electric and Magnetic Fields
GEN	General Planning Principles
GES	Good Environmental Status Descriptors
GHG	Greenhouse Gas
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GPP	Guidance for Pollution Prevention
GVA	Gross Value added
Ha	Hectare(s)
HES	Historic Environment Scotland
HGV	Heavy Goods Vehicle
HIE	Highlands and Islands Enterprise
HLAMap	Historic Land-Use Assessment Data for Scotland
HRA	Habitats Regulations Appraisal
HwLDP	Highland wide Local Development Plan
IMO	International Maritime Organization
IROPI	Imperative Reasons of Overriding Public Interest
ISoM	Initial Schedule of Mitigation
JNCC	Joint Nature Conservation Committee
km	kilometres
km^2	Kilometres-squared
LCA	Land Capability for Agriculture
LCT	Landscape Character Types
LDP	Local Development Plans
LSE	Likely Significant Effects
LVIA	Landscape and Visual Impact Assessment
m	metres

Acronym	Definition
m^2	Metres-squared
m^3	Metres-cubed
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MPA	Marine Protected Area
mph	mile per hour
MPS	Marine Policy Statement
$MtCO_2e$	Million tonnes carbon dioxide equivalent
NBN	National Biodiversity Network
NCAP	National Collection of Aerial Photography
MPA(NC)	Nature Conservation Marine Protected Area
NIEA	Northern Ireland Environment Agency
NRHE	National Record for the Historic Environment
NM	Nautical Miles
NML	Noise Monitoring Location
NMP	Scottish National Marine Plan
NMPi	National Marine Plan Interactive
NPF	National Planning Framework
NRW	Natural Resources Wales
NSA	National Scenic Areas
NSR	Noise Sensitive Receptors
OSPAR	The Convention for Protection of the Marine Environment of the North-East Atlantic
PAC	Pre-Application Consultation
PAN	Planning Advice Note
PMF	Priority Marine Feature
PTS	Permanent Threshold Shift
s	seconds
SAC	Special Area of Conservation
ScotPHO	Scottish Public Health Observatory
SEL_{cum}	cumulative weighted Sound Exposure Level
SEPA	Scottish Environment Protection Agency
SLA	Special Landscape Area
SoM	Schedule of Mitigation
SPA	Special Protected Area
SPAD	Scottish Palaeoecological Archive Database
SPL_{peak}	peak Sound Pressure Level
SPP	Scottish Planning Policy
SSEN	Scottish and Southern Electricity Networks
SSSI	Sites of Special Scientific Interest
SW	Spectral Wave
THC	The Highland Council
TTS	Temporary Threshold Shift
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
WFD	Water Framework Directive
WHO	World Health Organisation
WHILDP	West Highland and Islands Local Development Plan
ZTV	Zone of Theoretical Visibility

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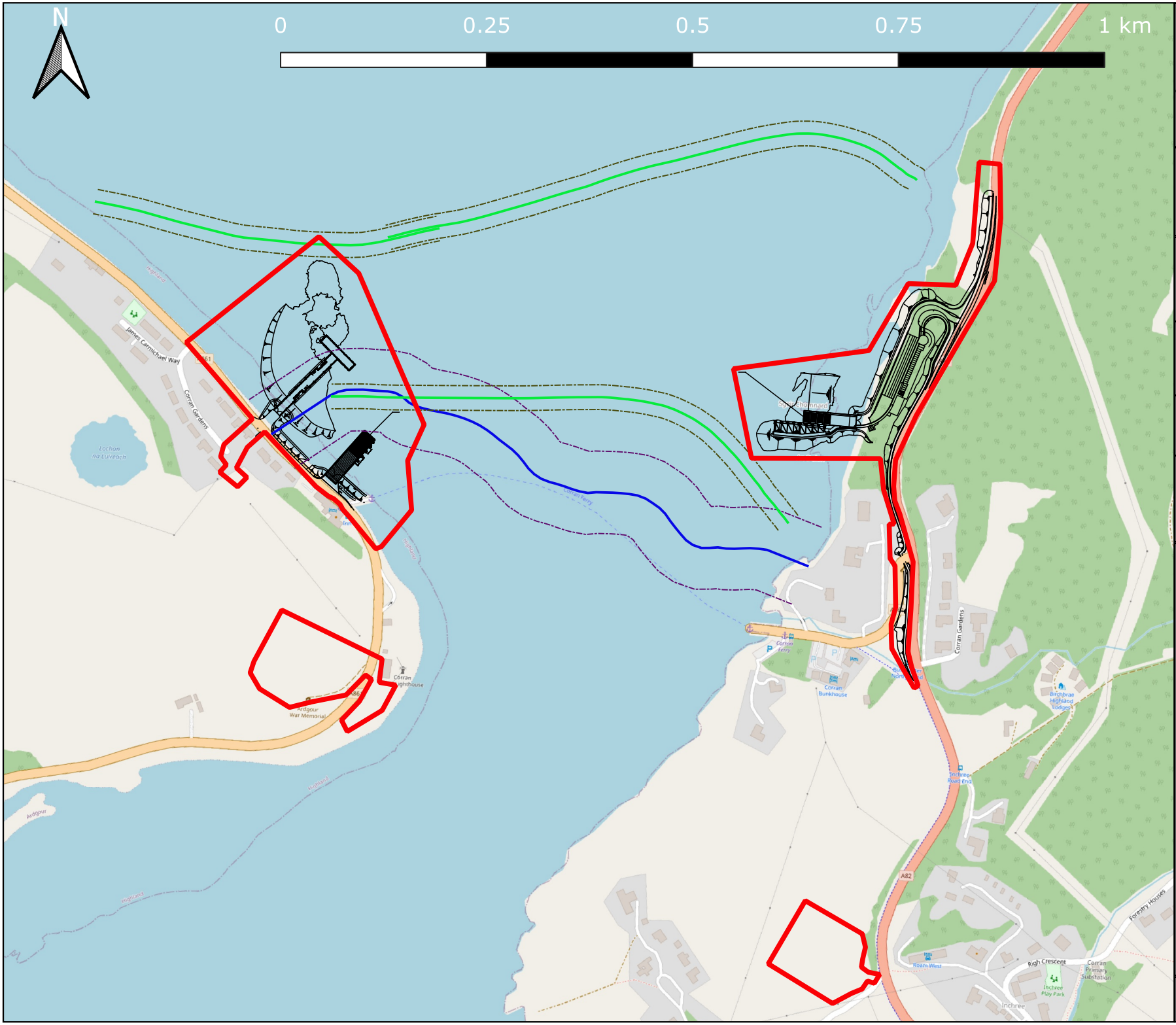
Drawings



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Title: 99_DRG_15_1 Scoping Boundary (with SSEN cables)

Projection: OSGB 1936/British National Grid
EPSG: 27700

Open Streetmap
"Base map and data from OpenStreetMap and OpenStreetMap Foundation".
OpenStreetMap® is open data, licensed under the Open Data Commons Open Database License (ODbL) by the OpenStreetMap Foundation (OSMF)

Legend

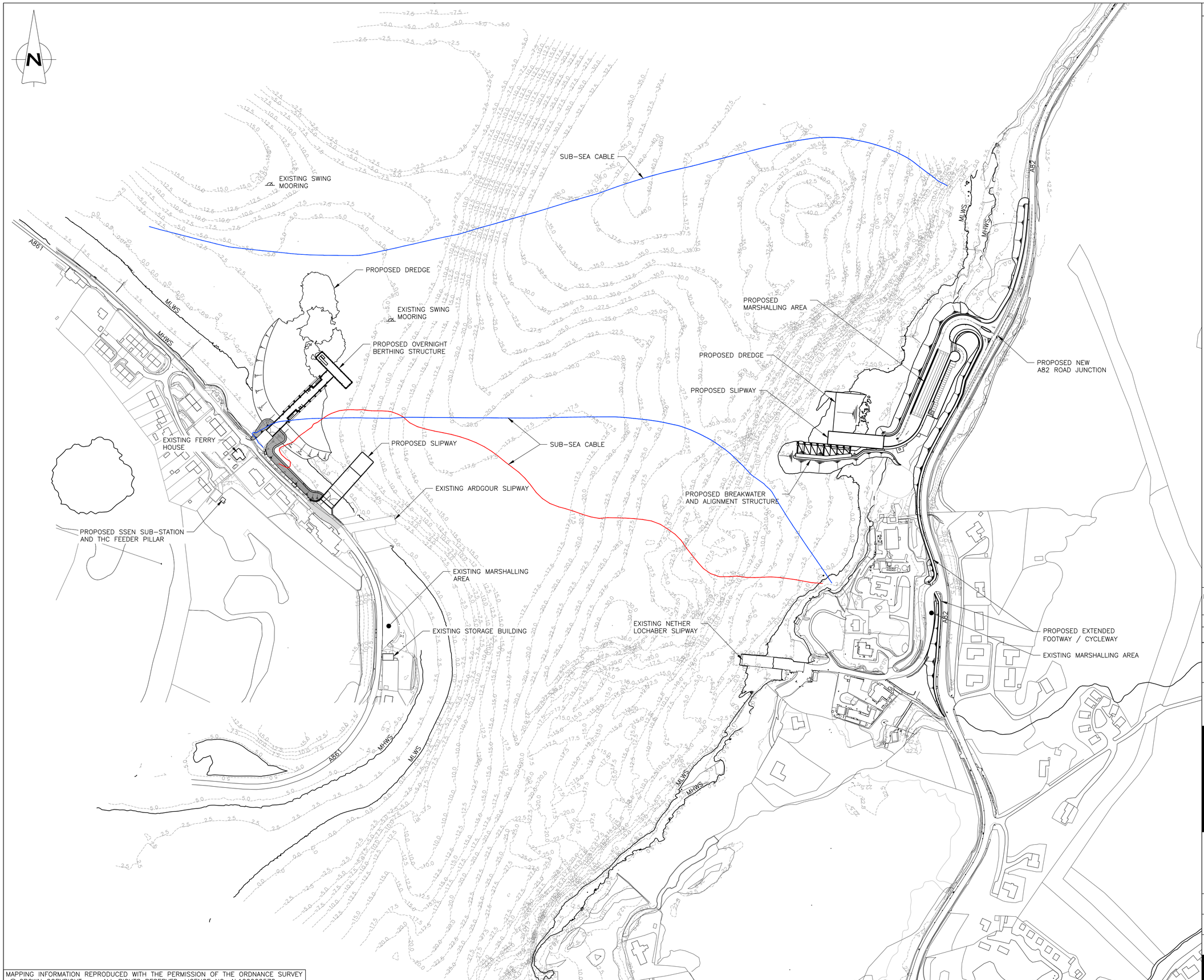
- Conceptual Design
- Scoping Boundary

11kV Cable

- 11kV Currently Energised
- 11kV Exclusion Zone

33kV Cables

- 33kV De-energised Cables
- 33kV Exclusion Zone



GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES RELATIVE TO CHART DATUM UNLESS NOTED OTHERWISE.
3. CHART DATUM IS 1.96m BELOW ORDNANCE DATUM.
4. TIDE LEVELS ARE AS BELOW:

HAT	+4.9mCD
MHWS	+4.4mCD
MHWN	+3.3mCD
MLWN	+1.7mCD
MLWS	+0.7mCD
LAT	0.0mCD

5. FOR PROPOSED NETHER LOCHABER LAYOUT, REFER TO DRAWING NUMBER 2387-WS-ZZ-NL-DR-C-5101.
6. FOR PROPOSED ARDGOUR LAYOUT, REFER TO DRAWING NUMBER 2387-WS-ZZ-AG-DR-C-0102.
7. SWING MOORINGS (2NO.) FOR EXISTING MV CORRAN AND MV MAID OF GLENCOUL

REV	DATE	DETAILS	DRAWN	CHK'D	APP'D
P02	08.05.24	ARDGOUR MARSHALLING, ACCOMMODATION AND OVERNIGHT STRUCTURE REVISED.	LS	BP	TR

AMENDMENTS

CLIENT

The Highland Council
Comhairle na Gaidhealtachd

PROJECT

CORRAN FERRY REDEVELOPMENT

Wallace Stone
Consulting Civil Engineers

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DRAWING TITLE

PROPOSED SITE LAYOUT

DRAWN	CHECKED	APPROVED
PM	BP	BP
DATE 02.04.24	DATE 03.04.24	DATE 03.04.24
SCALE (A1) 1:2000	STAGE PRELIMINARY	REV P02

DRAWING No.
2387-WS-ZZ-ZZ-DR-C-0101

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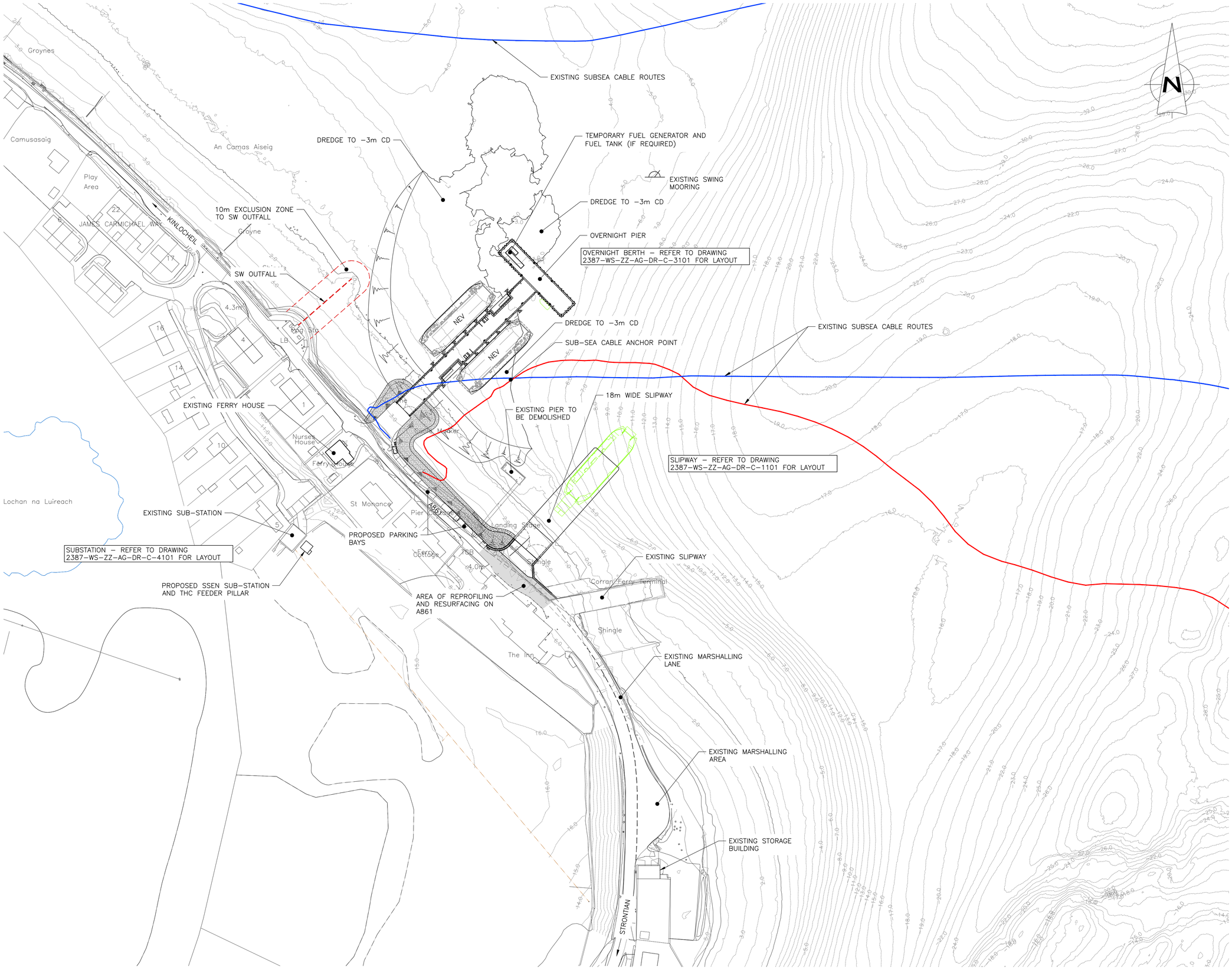

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2. ALL LEVELS ARE IN METRES RELATIVE TO CHART DATUM UNLESS NOTED OTHERWISE.
3. TIDE LEVELS ARE AS FOLLOWS:

HAT	+4.9mCD
MHWS	+4.4mCD
MHWN	+3.3mCD
MLWN	+1.7mCD
MLWS	+0.7mCD
LAT	0.0mCD

4. CHART DATUM IS 1.96m BELOW ORDNANCE DATUM.
5. NEV = NEW ELECTRIC VESSEL
6. EXISTING SSEN CABLES TO BE DE−ENERGISED AND REMOVED LOCALLY TO ACCOMMODATE WORKS.
7. SWING MOORINGS ON SEABED FOR MV CORRAN AND MV MAID OF GLENCOUL.

LEGEND

SUBSEA CABLE – (DE−ENERGISED)

SUBSEA CABLE – (ENERGISED)

REV	DATE	DETAILS	DRAWN	CHK'D	APP'D
P03	26.03.24	PROPOSED MARSHALLING AREA REMOVED. PROPOSED ACCOMMODATION REMOVED. EX MARSHALLING LANE EXTENDED	LS	BP	TR
P02	14.03.24	REVISED OVERNIGHT BERTH STRUCTURE. ALIGNMENT STRUCTURE REMOVED. SLIPWAY WIDENED.	LS	BP	TR

AMENDMENTS

CLIENT

The Highland Council
Comhairle na Gaidhealtachd

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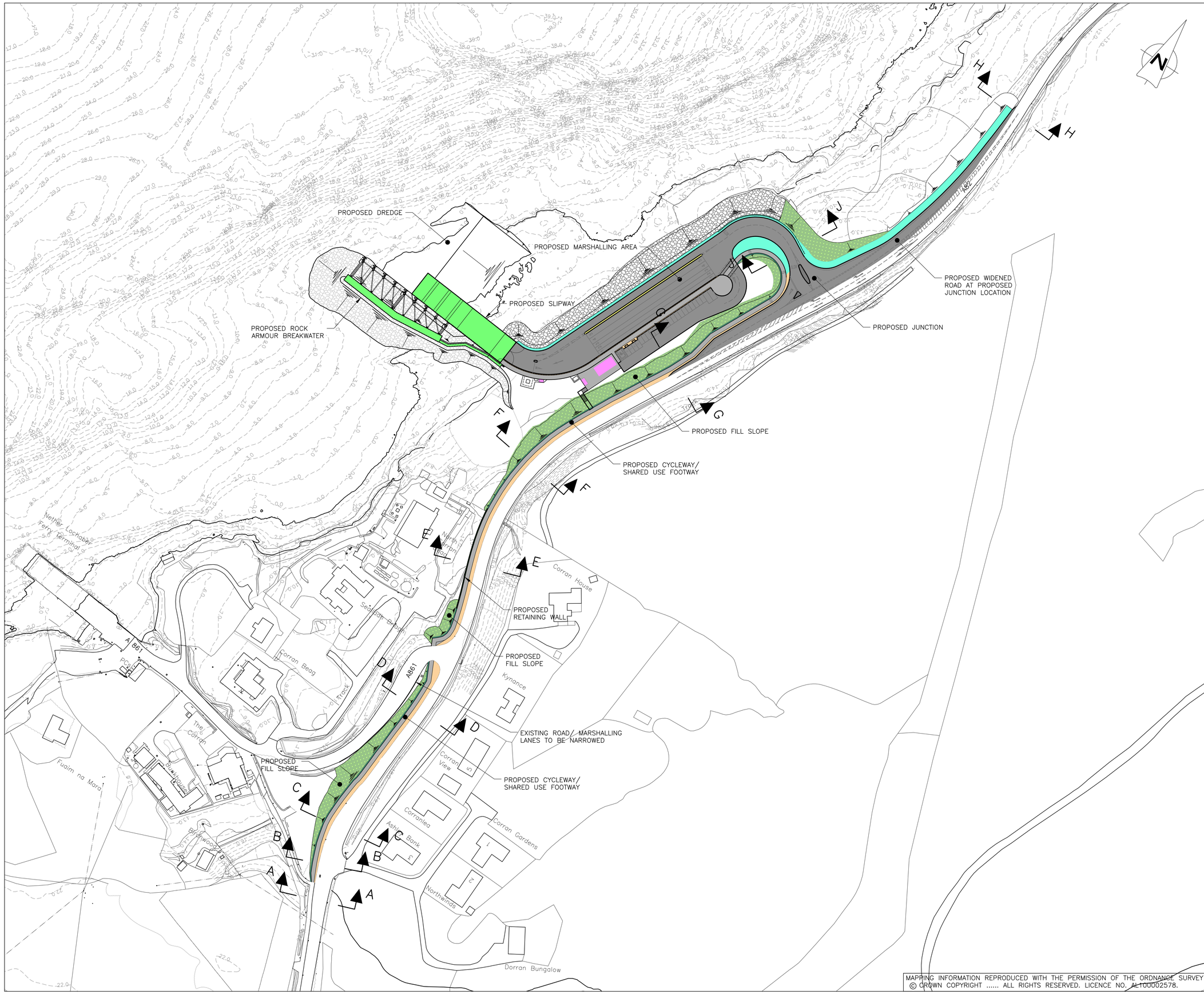
DRAWING TITLE

ARDGOUR PROPOSED SITE LAYOUT

DRAWN	CHECKED	APPROVED
LS	BP	TR
DATE	DATE	DATE
OCT 2023	07.02.2024	07.02.2024
SCALE (A1) 1:1000	STAGE PRELIMINARY	REV P03

DRAWING No.
2387−WS−ZZ−AG−DR−C−0102



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MLWN	+1.7mCD
MLWS	+0.7mCD
LAT	0.0mCD

5. FOR MARSHALLING AREA LAYOUT REFER TO DRAWING NUMBER 2387–WS–ZZ–NL–DR–C–5102.
6. FOR SLIPWAY AND ALIGNMENT STRUCTURE LAYOUT REFER TO DRAWING NUMBER 2387–WS–ZZ–NL–DR–5103.
7. FOR A82 SECTIONS REFER TO DRAWING NUMBERS 2387–WS–ZZ–NL–DR–5111 TO 5114.

LEGEND:

- PROPOSED CARRIAGEWAY
- PROPOSED FOOTWAY / CYCLEWAY
- PROPOSED TRAFFIC ISLAND
- PROPOSED BUFFER
- PROPOSED VERGE
- PROPOSED CONCRETE
- PROPOSED SLOPE
- PROPOSED STONE WALL
- PROPOSED BUILDING
- PROPOSED ROCK ARMOUR

REV	DATE	DETAILS	DRAWN	CHK'D	APP'D
P02	01.04.24	DREDGE PROFILE REVISED	PM	BP	BP

AMENDMENTS

CLIENT: The Highland Council / Comhairle na Gaidhealtachd

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DRAWING TITLE

NETHER LOCHABER PROPOSED GENERAL LAYOUT

DRAWN	CHECKED	APPROVED
PM	BP	TR
DATE 27.10.23	DATE 21.12.23	DATE 21.12.23
SCALE (A1) 1:1000	STAGE PRELIMINARY	REV P02

DRAWING No.
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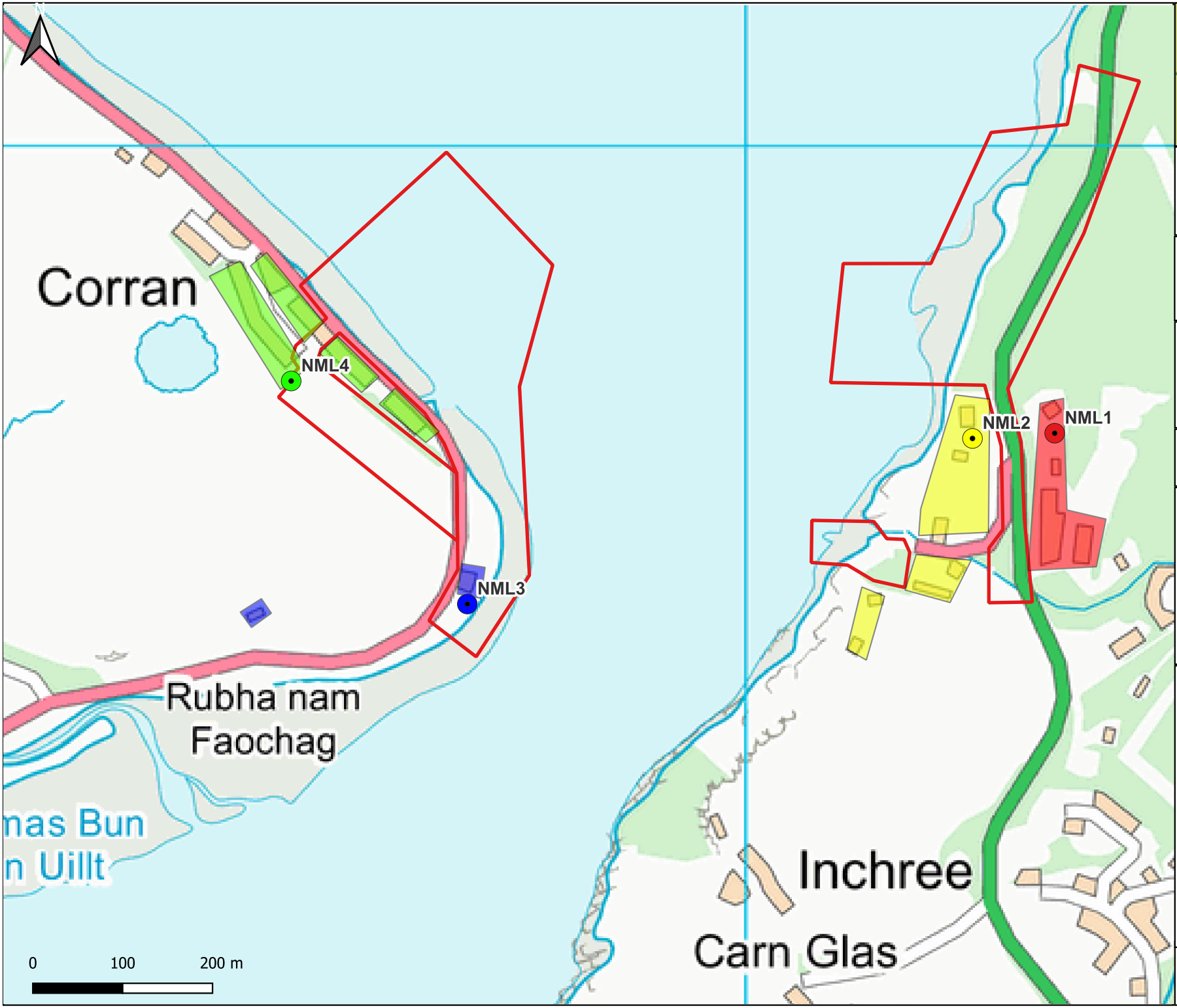

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Email: info@affriclimited.co.uk
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Title:
99_DRG_08_1 Corran Ferry Infrastructure Improvement Scheme Noise Monitoring Locations and Noise Sensitive Receptors

Projection: OSGB 1936/British National Grid
EPSG: 27700
Scale 1:6000

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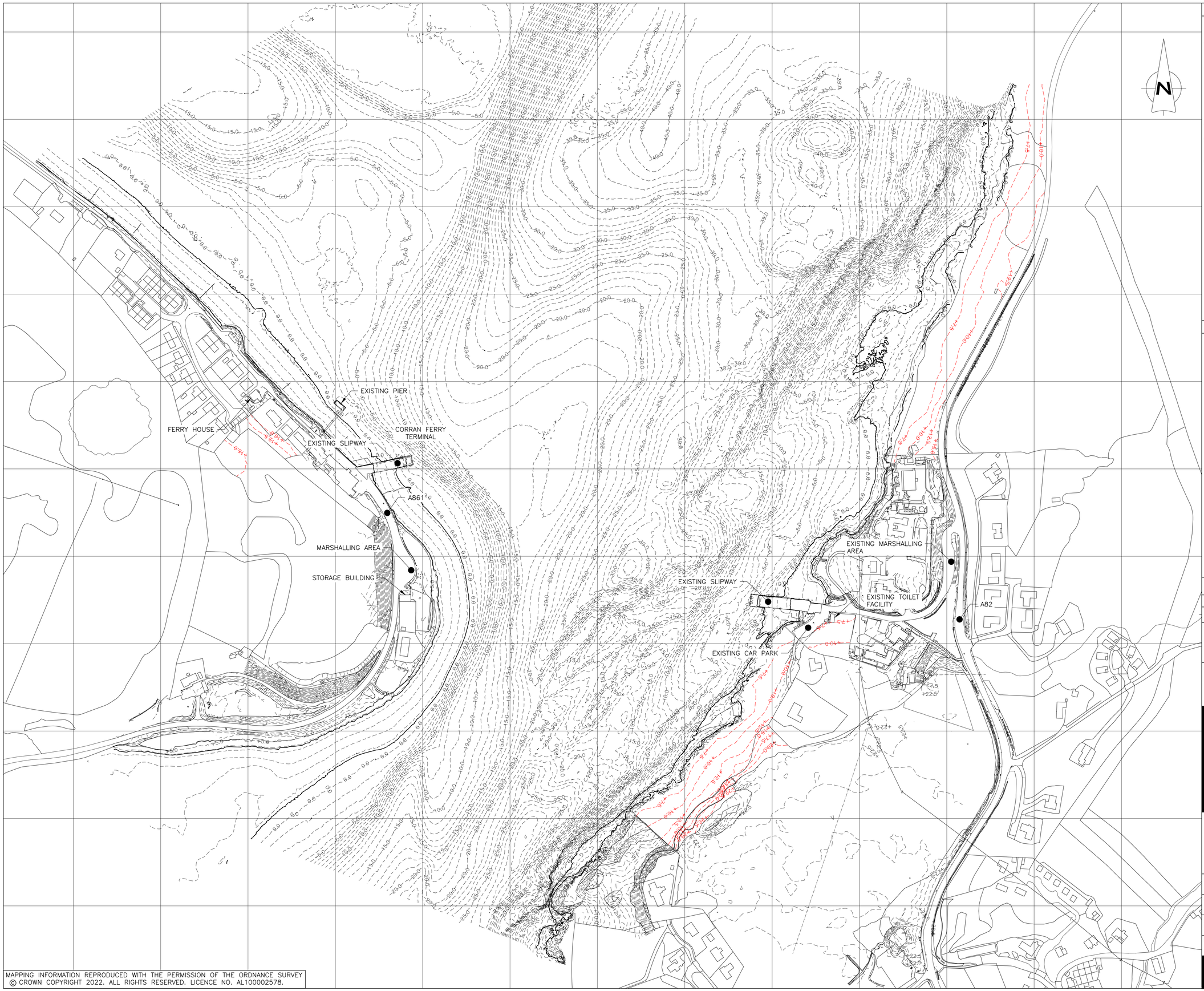
Legend

- Indicative Red Line Boundary
- **Indicative Noise Monitoring Locations (NMLs)**
  - NML1
  - NML2
  - NML3
  - NML4
- **Nearest Noise Sensitive Receptors (NSRs)**
  - Nearest NSRs Represented by NML1
  - Nearest NSRs Represented by NML2
  - Nearest NSRs Represented by NML3
  - Nearest NSRs Represented by NML4

Page 1	Rev No: 1	Drawing Date: 24/08/2023



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MLWN	+1.7mCD
MLWS	+0.7mCD
LAT	0.0mCD

4. CHART DATUM IS 1.96m BELOW ORDNANCE DATUM.
5. BATHYMETRIC CONTOURS (BELOW MHWS) SHOWN AT 1m INTERVALS WITH LABELS EVERY 5m.
6. TOPOGRAPHIC CONTOURS (ABOVE MHWS) SHOWN AT 0.5m INTERVALS WITH LABELS EVERY 2.5m.

LEGEND

0.0 CONTOURS (FROM ASPECT SURVEY DATA)

0.0 INDICATIVE CONTOURS (FROM ORDNANCE SURVEY DATA)

REV	DATE	DETAILS	DRAWN	CHK'D	APP'D
A	08.09.22	MINOR AMENDMENTS.	TC	BP	TR

AMENDMENTS

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The Highland Council
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DRAWING TITLE

EXISTING SITE LAYOUT

DRAWN	CHECKED	APPROVED
TC	BP	TR
DATE	DATE	DATE
JUL 22	JUL 22	JUL 22

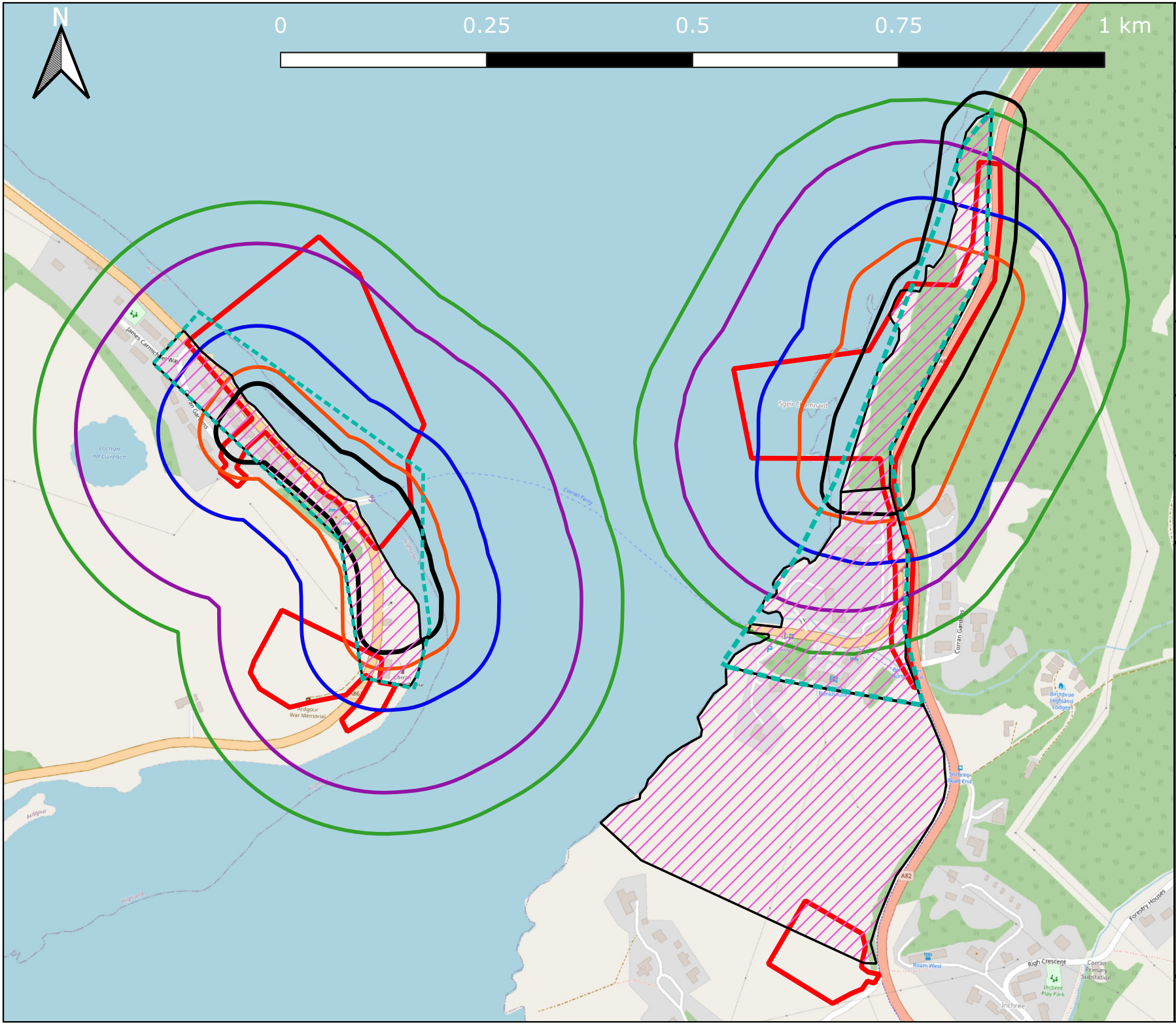
SCALE (A1) 1:2000

STAGE PRELIMINARY

REVISION A

PROJECT No. 2387

DRAWING No. 901



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Title: 99_DRG_14_1 Ecological Survey Boundaries

Projection: OSGB 1936/British National Grid
EPSG: 27700

Open Streetmap
"Base map and data from OpenStreetMap and OpenStreetMap Foundation".
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Legend

- Scoping Boundary
- Breeding Bird Survey Area
- PEA Survey Area
- PSS Bat Survey Area
- PSS Red Squirrel Survey Area
- PSS Badger Survey Area
- PSS Otter Survey Area
- PSS Pine Marten Survey Area

Corran Ferry

Affric

Bare Earth Zone of Theoretical Visibility

Viewpoint list
1 - Linnhe Picnic Area
2 - Nether Lochaber Ferry Terminal
3 - Ardgour Ferry Terminal
4 - Ardgour Village
5 - A861, north of Ardgour
6 - Proposed slipway on eastern loch shore
7 - North of Nether Lochaber Ferry Terminal

13. Moidart - Ardgour

Ben Nevis and Glen Coe

Ardgour House

Key

- Site boundary
- 1km buffers to 5km
- Landscape Viewpoint
- Corepath
- Sustrans cycle route
- Scheduled Monument
- Garden or Designed Landscape
- Wild Land Area
- Special Landscape Area
- National Scenic Area
- Visibility of berthed ferry (max 20m height)

Zone of Theoretical Visibility

Modelled height 10m above ground, including reclaimed land

- Highest visibility of proposals (100% visible)
- Lowest visibility of proposals

Generated using Ordnance Survey's Terrain5 dataset which does not take into account the screening effects of buildings or vegetation.

ZTV calculated using ArcGIS 10.6 Viewshed tool with observer eye height 2m above ground and corrections for earth curvature and atmospheric refraction applied

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0 0.5 1 2
Kilometres

N

Scale @ A3:
1:40,000

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18/04/2024 19411/ZV/001c
Drawn by: TH Checked by: KM Approved by: TH

Corran Ferry

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Screened Zone of Theoretical Visibility

Viewpoint list
1 - Linnhe Picnic Area
2 - Nether Lochaber Ferry Terminal
3 - Ardgour Ferry Terminal
4 - Ardgour Village
5 - A861, north of Ardgour
6 - Proposed slipway on eastern loch shore
7 - North of Nether Lochaber Ferry Terminal

13. Moidart - Ardgour

Ben Nevis and Glen Coe

Key
- Site boundary
- 1km buffers to 5km
- Landscape Viewpoint
- Corepath
- Sustrans cycle route
- Scheduled Monument
- Garden or Designed Landscape
- Wild Land Area
- Special Landscape Area
- National Scenic Area
- Building
- Woodland
- Visibility of berthed ferry (max 20m height)

Zone of Theoretical Visibility

Modelled height 10m above ground, including reclaimed land

Highest visibility of proposals (100% visible)

Lowest visibility of proposals

Visibility calculated using Ordnance Survey's Terrain5 DTM dataset, with screening effects of woodland (10m) and buildings (6m) modelled using layers from OS OpenMapLocal data.

ZTV calculated using ArcGIS 10.6 Viewshed tool with observer eye height 2m above ground and corrections for earth curvature and atmospheric refraction applied.

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0 0.5 1 2
Kilometres

N

Scale @ A3:
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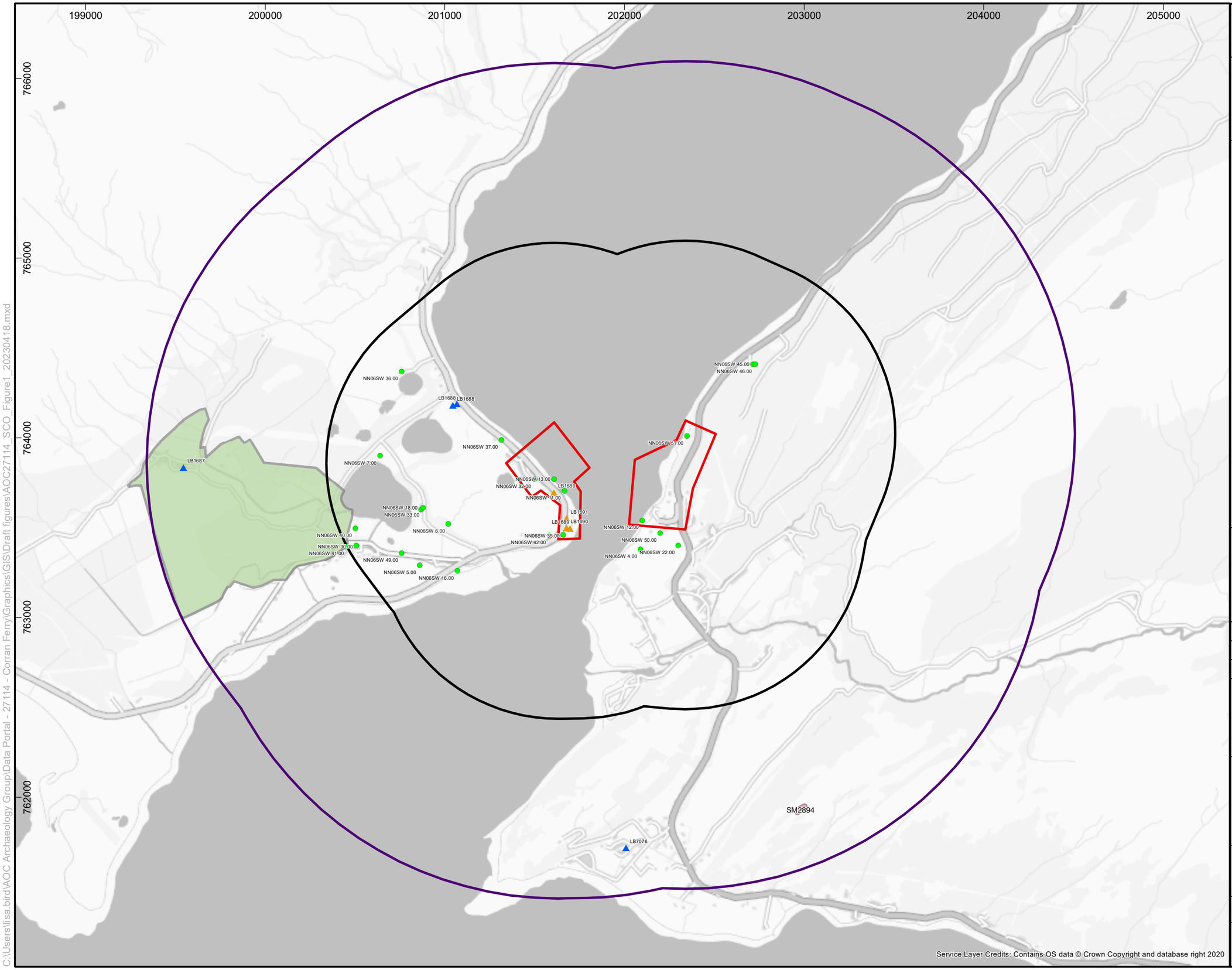

C:\Users\lisa.bird\AOC Archaeology Group\Data Portal - 27114 - Corran Ferry\Graphics\GIS\Draft figures\AOC27114_SCO_Figure1_20230418.mxd

Figure 1

Heritage Constraints Map

Legend
- Site Boundary
- 1km Study Area
- 2km Study Area
- Scheduled Monument Extent
- Listed Building- Category B
- Listed Building- Category C
- Inventory Garden and Designed Landscape Extent
- Non-designated Heritage Asset

FOR
Affric

Drawn/checked:	LB/SO
DWG no:	01/27114/Sco/01/01
AOC Project No.:	27114

AOC Archaeology Group

(C) AOC Archaeology Group 2023

N

SYSTEM
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE
1:20,000 @ A3

SCALE
0 1,000m

Appendix 1. Environment Agency's Water Framework Directive Scoping Template

Water Framework Directive assessment: scoping template for activities in estuarine and coastal waters

Use this template to record the findings of the scoping stage of your Water Framework Directive (WFD) assessment for an activity in an estuary or coastal water.

If your activity will:

- take place in or affect more than one water body, complete a template for each water body
- include several different activities or stages as part of a larger project, complete a template for each activity as part of your overall WFD assessment

The WFD assessment guidance for estuarine and coastal waters will help you complete the table.

Your activity	**Description, notes or more information**
Applicant name	The Highland Council
Application reference number (where applicable)	*TBC*
Name of activity	CFIIS
Brief description of activity	*See Section 3 of Scoping Report*
Location of activity (central point XY coordinates or national grid reference)	*See section 2.1 of Scoping Report*
Footprint of activity (ha)	TBC
Timings of activity (including start and finish dates)	Approximately 18 months of construction works.
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	*See Section 3 of Scoping Report*
Use or release of chemicals (state which ones)	None planned

Water body[1]	**Description, notes or more information**
WFD water body name	*Loch Linnhe North*
Water body ID	*(SEPA ref: 200089)*
River basin district name	*Loch Linnhe*
Water body type (estuarine or coastal)	*Estuarine*
Water body total area (ha)	*25.3km^2*
Overall water body status (2022)	*Good*
Ecological status	*Good*
Chemical status	*Pass*
Target water body status and deadline	*Good*
Hydromorphology status of water body	*High*
Heavily modified water body and for what use	*NA*
Higher sensitivity habitats present	*Potential PMF: kelp beds*
Lower sensitivity habitats present	*Rocky shore*
Phytoplankton status	*High*
History of harmful algae	*No*
WFD protected areas within 2km	*None*

[1] *Water body information can be found in the Environment Agency's catchment data explorer and the water body summary table. Magic maps provide additional information on habitats and protected areas. Links to these information sources can be found in the WFD assessment guidance for estuarine and coastal waters.*

Specific risk information

Consider the potential risks of your activity to each of these receptors: hydromorphology, biology (habitats and fish), water quality and protected areas. Also consider invasive non-native species (INNS).

Section 1: Hydromorphology

Consider if hydromorphology is at risk from your activity.

Use the water body summary table to find out the hydromorphology status of the water body, if it is classed as heavily modified and for what use.

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status	Requires impact assessment	Impact assessment not required	*No - Waterbody currently good overall but high for hydromorphology.*
Could significantly impact the hydromorphology of any water body	Requires impact assessment	Impact assessment not required	*No - Unlikely but being considered as part of coastal processes (see Scoping Report Section 11.4.2).*
Is in a water body that is heavily modified for the same use as your activity	Requires impact assessment	Impact assessment not required	*No*

Record the findings for hydromorphology and go to section 2: biology.

Section 2: Biology

Habitats

Consider if habitats are at risk from your activity.

Use the water body summary table and Magic maps, or other sources of information if available, to find the location and size of these habitats.

Higher sensitivity habitats [2]	Lower sensitivity habitats [3]
chalk reef	cobbles, gravel and shingle
clam, cockle and oyster beds	intertidal soft sediments like sand and mud
intertidal seagrass	rocky shore
maerl	subtidal boulder fields
mussel beds, including blue and horse mussel	subtidal rocky reef
polychaete reef	subtidal soft sediments like sand and mud
saltmarsh	
subtidal kelp beds	
subtidal seagrass	

[2] *Higher sensitivity habitats have a low resistance to, and recovery rate, from human pressures.*

[3] *Lower sensitivity habitats have a medium to high resistance to, and recovery rate from, human pressures.*

Consider if the footprint[4] of your activity is:	Yes	No	Biology habitats risk issue(s)
0.5km^2 or larger	Yes to one or more – requires impact assessment	No to all – impact assessment not required	No
1% or more of the water body's area			No
Within 500m of any higher sensitivity habitat			Potentially close to subtidal kelp beds
1% or more of any lower sensitivity habitat			No

[4] *Note that a footprint may also be a temperature or sediment plume. For dredging activity, a footprint is 1.5 times the dredge area.*

Fish

Consider if fish are at risk from your activity, but only if your activity is in an estuary or could affect fish in or entering an estuary.

Consider if your activity:	Yes	No	Biology fish risk issue(s)
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary	Continue with questions	Go to next section	No - see Scoping Report Section 14.3.5, underwater noise impacts require further consideration for farmed fish only.
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)	Requires impact assessment	Impact assessment not required	
Could cause entrainment or impingement of fish	Requires impact assessment	Impact assessment not required	

Record the findings for biology habitats and fish and go to section 3: water quality.

Section 3: Water quality

Consider if water quality is at risk from your activity.

Use the water body summary table to find information on phytoplankton status and harmful algae.

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)	Requires impact assessment	Impact assessment not required	No
Is in a water body with a phytoplankton status of moderate, poor or bad	Requires impact assessment	Impact assessment not required	No
Is in a water body with a history of harmful algae	Requires impact assessment	Impact assessment not required	No

Consider if water quality is at risk from your activity through the use, release or disturbance of chemicals.

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the Environmental Quality Standards Directive (EQSD) list	Requires impact assessment	Impact assessment not required	No
It disturbs sediment with contaminants above Cefas Action Level 1	Requires impact assessment	Impact assessment not required	No

If your activity has a mixing zone (like a discharge pipeline or outfall) consider if:	Yes	No	Water quality risk issue(s)
The chemicals released are on the Environmental Quality Standards Directive (EQSD) list	Requires impact assessment[5]	Impact assessment not required	No

[5] *Carry out your impact assessment using the Environment Agency's surface water pollution risk assessment guidance, part of Environmental Permitting Regulations guidance.*

Record the findings for water quality go on to section 4: WFD protected areas.

Section 4: WFD protected areas

Consider if WFD protected areas are at risk from your activity. These include:

- special areas of conservation (SAC)
- special protection areas (SPA)
- shellfish waters
- bathing waters
- nutrient sensitive areas

Use Magic maps to find information on the location of protected areas in your water body (and adjacent water bodies) within 2km of your activity.

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within 2km of any WFD protected area[6]	Requires impact assessment	Impact assessment not required	No – Only the Moidart and Ardgour SPA designated for Golden Eagle (1.3km NW) within 2km, highly unlikely to be affected by water quality issues.

[6] *Note that a regulator can extend the 2km boundary if your activity has an especially high environmental risk.*

Record the findings for WFD protected areas and go to section 5: invasive non-native species.

Section 5: Invasive non-native species (INNS)

Consider if there is a risk your activity could introduce or spread INNS.

Risks of introducing or spreading INNS include:

- materials or equipment that have come from, had use in or travelled through other water bodies
- activities that help spread existing INNS, either within the immediate water body or other water bodies

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	Requires impact assessment	Impact assessment not required	Yes, see Scoping Report Sections 13.1.3, 14.1.3.3 and 14.1.4.1.

Record the findings for INNS and go to the summary section.

Summary

Summarise the results of scoping here.

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	
Biology: habitats	Yes	Benthic ecology impacts require consideration especially as PMF may be present.
Biology: fish	No	
Water quality	No	
Protected areas	No	
Invasive non-native species	Yes	Marine INNS onsite, need to avoid spread on and offsite.

If you haven’t identified any receptors at risk during scoping, you don’t need to continue to the impact assessment stage and your WFD assessment is complete.

If you’ve identified one or more receptors at risk during scoping, you should continue to the impact assessment stage.

Include your scoping results in the WFD assessment document you send to your activity’s regulator as part of your application for permission to carry out the activity.

Appendix 2. Preliminary Ecological Appraisal Report

Corran Ferry

Infrastructure Improvement Scheme

Preliminary Ecological Appraisal Report

Report No: 99_REP_05

Body Document and Appendices 1 & 2 only. Appendices 3 & 4 can be provided on request.

Date: 06/09/2022

Document Control

	Name	Title	Signature	Date
Author	Ffion Maguire	Ecologist	[Redacted]	06/09/2022
Reviewer	Claire Williams	Senior Environmental Consultant	[Redacted]	06/09/2022
Authoriser	Fiona Henderson	Director	[Redacted]	06/09/2022

Effective Date:	**06/09/2022**

Revision No:	Signature	Comments	Date
1A	[Redacted]	For internal review	06/09/2022
1	[Redacted]	For issue	06/09/2022

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Executive Summary

Affric Limited have undertaken a Preliminary Ecological Appraisal (PEA) of the land surrounding the existing ferry terminals at Ardgour and Nether Lochaber, either side of the Corran Narrows in Loch Linnhe, south of Fort William. The survey was undertaken to help inform the suitability of proposed locations for development works associated with the Corran Ferry Infrastructure Improvement Scheme (CFIIS) by outlining potential ecological constraints to development by providing baseline information on the ecological nature of the Survey Area and recommendations on further ecological survey work (if required). The PEA was undertaken by suitably qualified ecologists, Ffion Maguire and Texa Sim, on 23rd August 2022.

The site is situated within 5km of five designated sites, including Onich to North Ballachulish Woods and Shore Site of Special Scientific Interest (SSSI), Onich to North Ballachulish Special Area of Conservation (SAC), Moidart and Ardgour Special Protection Area (SPA), Glen Etive and Glen Fyne SPA and Kentallen SSSI. Habitats within the Survey Area are not considered to be an extension of the designates sites, however, may provide connective habitat for protected species in the wider locality. Both Moidart and Ardgour SPA and Glen Etive and Glen Fyne SPA are protected due to the presence of Golden Eagle (*Aquila chrysaetos*). However, the Survey Area was considered to be sub-optimal for the species due to the sub-urban nature of the site and subsequent disturbance and lack of suitable resources.

The Survey Area has been divided into four zones (Zone 1, 2, 3 and 4). Zones 1 – 3 are situated on the eastern bank of Loch Linnhe. Zone 4 is situated on the western bank of the loch. The Survey Area supports a range of habitats typical of a sub-urban coastal area, including buildings, amenity grassland, broadleaved woodland, coniferous woodland, scrub and heathland. The land surrounding the Survey Area is predominantly comprised of coniferous woodland, heathland, grazing pasture and hard infrastructure.

The broadleaved woodland situated in Zone 1 and the small pockets of coniferous and broadleaved woodland in Zones 2 and 3 have potential suitability for bats, Badger (*Meles meles*), Red squirrel (*Sciurus vulgaris*) and Pine marten (*Martes martes*). Therefore, if works are proposed within these Zones, further species-specific surveys will be required.

Breeding Bird Surveys were undertaken by Atmos Consulting Limited in the summer of 2022 to determine potential ecological constraints in relation to ornithology. Thus, although this report contains comment on birds identified within the Survey Area, the Breeding Bird Survey Report should be referred to for recommendations in relation to ornithology.

Rhododendron (*Rhododendron ponticum*) and Japanese Knotweed (*Fallopia japonica*) were identified within the Survey Area. Both species are Invasive Non-Native Species (INNS) listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). If construction works encroach upon areas supporting invasive species, INNS Management Plans (INNSMP) will be required. Extensive Rhododendron clearance has recently been undertaken within Zone 3. As such, the current habitat predominantly comprised of cleared vegetation. The clearance of invasive species is likely to have a positive impact upon the habitat by promoting the growth of native species. If construction works are to take place within Zone 3, there may be a need to re-survey the area. Habitats within Zone 3 are known to support Lesser butterfly-orchid (*Platanthera bifolia*), a UK Biodiversity Action Plan (BAP) protected species. Lesser butterfly-orchid was not identified during the Extended Phase 1 Habitat Survey, however, a National

Vegetation Classification (NVC) Survey of Zone 3 would be advisable if it is to be included within the proposed design.

1 Introduction

Affric Limited have undertaken a Preliminary Ecological Appraisal (PEA) of the land surrounding the existing ferry terminals at Ardgour and Nether Lochaber, either side of the Corran Narrows in Loch Linnhe, south of Fort William. The purpose of the survey was to help inform the suitability of proposed locations for development works associated with the Corran Ferry Infrastructure Improvement Scheme (CFIIS) by providing baseline information on the ecological nature of the Survey Area and identifying potential ecological constraints to development.

For the purpose of this report, the 'Survey Area' includes the land situated within the blue line boundary (Drawing 99_DRG_02_01). The Survey Area covers in the region of 20ha, which includes land on both the eastern and western banks of Loch Linnhe. The Survey Area has been split into four Zones (Zones 1, 2, 3 and 4), in order to help identify specific areas requiring further survey work. Survey Zones are shown in Drawing 99_DRG_02_1.

1.1 Objectives of Study

The purpose of the Preliminary Ecological Appraisal Report (PEAR) is to establish the baseline ecological conditions of the Survey Area and inform of potential ecological constraints to development by undertaking an Extended Phase 1 Habitat Survey and desktop study.

This report will detail the following:

- Desk study results;
- Field survey methodology;
- Field survey results; and
- Recommendations for further survey (if required).

1.2 Survey Area Description

The Survey Area runs alongside either side of Loch Linnhe, through the villages of Nether Lochaber and Ardgour. As such, much of the surrounding area incorporates habitats and infrastructure associated with a coastal village. A large part of the Survey Area is part of the sub-urban landscape, comprised of residential and commercial buildings with associated hard and soft landscaping. However, areas of woodland, grassland, scrub and heathland remain. Rhododendron (*Rhododendron ponticum)* has become a significant problem within the local area, dominating much of the existing habitats.

1.3 Proposed Works

The Highland Council (THC) are proposing to upgrade the existing ferry terminals at Corran. The upgrade will involve the replacement of the existing ferry with two electric vessels requiring installation of infrastructure to support their use, including a new slipway at Ardgour and Nether-Lochaber, marshalling areas, public facilities, and a berthing pier. The development will involve both marine construction and dredging works below Mean High Water Springs (MHWS), as well as construction works above Mean Low Water Springs (MLWS). Several designs are proposed. The PEAR will help assist design selection by informing the suitability of proposed locations for development works associated with the CFIIS.

2 Methodology

2.1 Study Area

The Survey Area covers around 20ha of land along the western and eastern banks of Loch Linnhe. As the PEAR was undertaken to inform optioneering. The Survey Area was comprised of four Zones (Zones 1, 2, 3 and 4) which were chosen with the various design proposals in mind and were comprised of potential construction zones with an buffer deemed appropriate for the ecological nature and landscape of the site. The desktop study was extended to include a 5km buffer from the Survey Area in order to properly assess local records of species populations which may utilise the wider habitat mosaic.

2.2 Desktop Study

A data collection exercise was undertaken to provide additional contextual ecological information of the site.

Ecological background information of the survey area and 5km buffer was obtained from a variety of sources. Information of designated sites was obtained from DEFRA via MAGIC Map (DEFRA, 2022) and NatureScot via SiteLink (NatureScot, 2022). A review of information available on the National Biodiversity Network (NBN) Atlas (NBN, 2022) was undertaken to obtain information on local records of protected species. Aerial photography from Google Maps (Google, 2022) was also utilised.

2.3 Extended Phase 1 Habitat Survey

An Extended Phase 1 Habitat Survey was undertaken by suitably qualified ecologists, Ffion Maguire and Texa Sim on 23rd August 2022 following the guidance of CIEEM's Guidelines for Baseline Ecological Assessment (CIEEM, 2017). The Extended Phase 1 Habitat Survey was undertaken across the entirety of the Survey Area. The survey should not be considered to be representative of a full protected species or botanical survey but a baseline survey to provide an overview of the ecology of the site to help inform upon the need for further survey work (if required).

Phase 1, as described in JNCC's Handbook for Phase 1 Habitat Survey, a Technique for Environmental Audit (JNCC, 2010), is considered to be a standardised method of assessing and recording habitat types. Habitats within the Survey Area were mapped on-site. Where required, descriptive 'Target Notes' were recorded for features of ecological interest (Appendix 2). A Site Habitat Map was produced using Quantum Geographic Information System (QGIS) software.

The Extended Phase 1 Habitat Survey included a preliminary survey of the site's suitability to support protected species. In order to assess the site's suitability for protected species, species-specific best practice guidelines were followed.

2.4 Limitations

The survey was undertaken during heavy rain. The heavy rain caused much of the rocky coastline to become inaccessible due to risk of slipping. However, as the habitat was situated below the high tide mark, access was not required as part of the terrestrial Extended Phase 1 Habitat Survey. There were access limitations within the woodland and heathland due to dense ground flora, although it was still possible to suitably map the habitats. Some locations within the Survey Area could not be accessed due to constraints of land ownership. However, this

land was part of residential plots, and as such will not be impacted as part of development. Residential plots comprised of residential dwellings, outbuildings, mown gardens and introduced shrub were mapped as 'buildings'. The site survey was undertaken during August, which is considered to be an appropriate time to complete a Phase 1 Habitat Survey. On the other hand, August is considered to be sub-optimal for the survey of certain species, such as Badger (*Meles meles*).

3 Results

3.1 Desktop Study

3.1.1 Statutory Designated Sites

A review of SiteLink and MAGIC Maps confirmed that there are several designated sites within 5km of the Survey Area (Table 3.1).

Table 3.1.1: Summary of Designated Sites within 5km of the Survey Area

Designated Site	Approximate distance from Survey Area	Ecological Features of Importance	Comments
Onich to North Ballachulish Woods and Shore SSSI	0.5km SE	Structural and metamorphic geology; calcium-rich spring water-fed fens; upland mixed ash woodland; and upland oak woodland	The site supports semi-natural woodland, unusual mire communities and Dalradian rocks. The woods are of ecological interest both for their extent and for the variation in structure and flora
Onich to North Ballachulish SAC	0.5km SE	Old Sessile oak (*Quercus petraea*) woods with Ilex and Blechnum with smaller areas of alkaline fens and Tilio-Acerion forests	The site supports three Annex I habitats, including 91A0 old Sessile oak woods with Ilex and Blechnum; 7230 Alkaline fens and 9180 Tilio-Acerion forests
Moidart and Ardgour SPA	1km NW	Regularly supports a population of Golden eagle (*Aquila chrysaetos*)	In 2003, 11 territories of Golden eagle were recorded, which is more than 2.4% of the GB population
Glen Etive and Glen Fyne SPA	4km SSE	Regularly supports a population of Golden eagle (*Aquila chrysaetos*)	In 2003, 19 territories of Golden eagle were recorded, which is more than 4.2% of the GB population
Kentallen SSSI	5km SSW	Geological SSSI	No further information available

3.1.2 Non-statutory Designated Sites

There are no known non-statutory designated sites within 5km of the Survey Area.

3.1.3 Protected Species Records

A review of existing species records on NBN Atlas indicates that there are records of protected within the Survey Area and 5km buffer. An overview of herptiles (amphibians and reptiles) and

protected terrestrial mammals recorded within 500m of the Survey Area and Red Birds of Conservation Concern (BoCC) and protected invertebrate species recorded within the Survey Area is shown in Table 3.2.

Table 3.1.2: Overview of species records

Group	Common name	Scientific name
Amphibians	Common frog	*Rana temporaria*
Birds	Common bullfinch	*Pyrrhula pyrrhula*
	Common cuckoo	*Cuculys canorus*
	Dunlin	*Calidris alpina*
	Eurasian curlew	*Numenius arquata*
	Herring gull	*Larus argentatus*
	House sparrow	*Passer domesticus*
	Kittiwake	*Rissa tridactyla*
	Long-tailed tit	*Aegithalos caudatus*
	Mistle thrush	*Turdus viscivorus*
	Ringed plover	*Charadrius hiaticula*
	Shag	*Phalacrocorax aristotelis*
	Song thrush	*Turdus philomelos*
	Starling	*Sturnus vulgaris*
	Whinchat	*Saxicola rubetra*
	Wood warbler	*Phylloscopus sibilatrix*
Reptiles	Common lizard	*Zootoca vivipara*
	Slow-worm	*Anguis fragilis*
Terrestrial mammals (excl. bats)	Eurasian otter	*Lutra lutra*
	Eurasia red squirrel	*Sciurus vulgaris*
	Pine marten	*Martes martes*
Invertebrates - bees	Moss carder-bee	*Bombus muscorum subsp. celtibus*

3.1.4 Invasive Species Records

Japanese knotweed (*Fallopia japonica*) and Himalayan balsam (*Impatiens glandulifera*) have been previously recorded within Zone 4, on the western banks of Loch Linnhe. Both species are listed as invasive under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

3.2 Extended Phase 1 Habitat Survey

3.2.1 Habitats

The Survey Area was comprised of habitats associated with a coastal village in the Scottish Highlands. Much of the Survey Area was developed with residential and commercial plots. However, the Survey Area also supports semi-natural habitats such as woodland and heathland. The areas of habitat types identified within each of the four zones is provided in Table 3.3. A description of habitats present within the Survey Area is shown in Table 3.4. A Site Habitat Map has been produced using QGIS to provide a visual representation of the habitats present within the Survey Area (Drawing 99_DRG_02_1).

Table 3.3: Approximate Area of Each Habitat Type (as Described in JNCC, 2010), Identified within the Four Survey Zones

Habitat Type	Approximate Area within Zone 1	Approximate Area within Zone 2	Approximate Area within Zone 3	Approximate Area within Zone 4
Semi-natural broadleaved woodland	0.023km^2	0.005km^2	0.006km^2	N/A
Semi-natural coniferous woodland	N/A	0.003km^2	0.001km^2	N/A
Planted coniferous woodland	N/A	N/A	N/A	0.001km^2
Dense/continuous scrub	N/A	N/A	N/A	0.003km^2
Improved grassland	N/A	<0.001km^2	0.003km^2	0.001km^2
Poor semi-improved grassland	N/A	N/A	N/A	0.003km^2
Amenity grassland	N/A	0.003km^2	N/A	N/A
Introduced shrub	N/A	0.001km^2	0.024km^2	N/A
Buildings	N/A	0.022km^2	0.002km^2	0.018km^2
Other habitat	N/A	N/A	0.057km^2	N/A

Table 3.4: Overview Habitats Present within the Survey Area

Habitat code	Habitat	Description
A1.1.1	Semi-natural broadleaved woodland	Zone 1 is predominantly comprised of semi-natural broadleaved woodland. The majority of the woodland is dominated by stands of Silver birch (*Fagus sylvatica*) of forest growth form, with a low abundance of Alder (*Alnus glutinosa*), Rowan (*Sorbus aucuparia*), Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*), Wild cherry (*Prunus avium*) and Scots pine (*Pinus sylvestris*). In these areas, patches of Bracken (*Pteridium spp.*) and Bramble (*Rubus fruticosus*) dominate the understorey. A patch of Japanese Knotweed (*Fallopia japonica*) is present within the woodland and appears to be spreading westwards. Rhododendron (*Rhododendron ponticum*) is also present. In areas of the woodland where the ground becomes wetter due to small fens, Alder dominates. In these areas there is a decrease in the abundance of Bracken and Bramble, as Soft rush (*Juncus effusus*) takes precedence. Small patches of semi-natural broadleaved woodland are also present in Zones 2 and 3, though these were inaccessible due to dense scrub. However, the woodlands appeared to be dominated by Silver birch with an understorey dominated by Bramble.
A1.2.1	Semi-natural coniferous woodland	A small area of coniferous woodland is present in Zone 2. The woodland canopy isa monoculture of Scots Pine (*Pinus sylvestris*). The ground vegetation appears to be dominated by dense Rhododendron (*Rhododendron ponticum*) scrub, which limited accessibility to survey.
A1.3.2	Planted mixed woodland	Small linear feature dominated by Cherry laurel (*Prunus laurocerasus*) separating the residential plots in Zone 4 from grazing pasture at the rear.
A2.1	Continuous scrub	Linear feature of dense scrub situated in Zone 4 upon the western banks above the A861. Scrub dominated by Gorse (*Ulex spp.*), Bramble (*Rubus fruticosus*) and Rhododendron (*Rhododendron ponticum*). Young/semi-mature Rowan (*Sorbus* aucuparia) and Scots Pine (*Pinus sylvestris*) also present.

Habitat code	Habitat	Description
B4	Improved grassland	Equine grazing pasture in Zone 3 was inaccessible due to land ownership. Appeared to be dominated by Ryegrass (*Lolium spp.*). The grass sward was heavily grazed and showed indication of improvement. Sheep grazing pasture situated towards the west of Zone 4. Dominated by Ryegrass (*Lolium spp.*) and White clover (*Trifolium repens*), with a low abundance of Buttercup (*Ranunculus spp.*), and Dandelion (*Taraxacum officinale*). Small patches of tall herb, Thistle (*Cirsium spp.*) and large patches of Rush (*Juncus effusus*) are present.
B6	Poor semi-improved grassland	Patches of poor semi-improved grassland situated between residential and commercial plots and hard infrastructure within Zone 4. Grassland is relatively patchy. However, covers <75% of the ground. Low species diversity.
D1 & J1.4 matrix	Dry dwarf shrub heath, introduced shrub matrix	Dry upland dwarf heath dominated by Heather (*Calluna spp.*) and Gorse (*Ulex spp.*) that has become heavily encroached by dense patches of Rhododendron (*Rhododendron ponticum*) scrub situated towards the southwest of Zone 3.
J1.2	Amenity grassland	Area of amenity grassland to the north of the eastern ferry terminal in Zone 2. Species identification limited due to heavy mowing. Grassland appears to be dominated by Ryegrass (*Lolium spp.*) and White clover (*Trifolium repens*)
J5	Cleared introduced shrub (other habitat)	Area of recently cleared Rhododendron (*Rhododendron ponticum*) scrub, situated towards the southeast of Zone 3.
J6	Buildings	Residential plots, comprised of buildings with associated hard and soft landscaping, commercial buildings and hard infrastructure are present on both the western and eastern banks of Loch Linnhe (Zones 1, 2, 3 and 4).

3.2.2 Protected Species

3.2.2.1 Amphibians

No freshwater standing waterbodies have been formerly mapped within 250m of Zones 1, 2 or 3. Nonetheless, woodland, grassland and heathland habitats within the Survey Area provide suitable terrestrial habitats to support amphibians. As smaller, unmapped waterbodies may provide suitable breeding habitat for amphibians, it is recommended that Zones 1, 2 and 3 be considered suitable to support common and widespread amphibians as a precautionary approach.

Two lochans are present within 250m of Zone 4. The lochans are part of a larger habitat mosaic of standing waterbodies, grassland and heathland which likely support metapopulations of

common and widespread amphibian species. There are records of Common Frog (*Rana temporaria*) and Common Toad within 5km of the Survey Area. Residential plots and grassland within Zone 4 provide some suitability for amphibians and may be used as 'steppingstone' habitat whilst commuting.

Ultimately the entirety of the Survey Area was considered to have suitability to support populations of common and widespread amphibian species such as Common Frog.

3.2.2.2 Bats

A scoping survey was undertaken concurrently to the PEA to determine suitable habitats on-site for roosting bats which may require a Preliminary Bat Roost Assessment (PRA). Several woodland blocks were identified within Zones 1, 2 and 3. This included a large woodland block dominated by Silver birch (*Betula pendula*) which made up the majority of Zone 1, a small block of native coniferous woodland dominated by Scots pine (*Pinus sylvestris*) to the rear of the existing toilet block in Zone 2, and some small pockets of Silver birch dominated broadleaved woodland within Zones 2 and 3. The woodland blocks were all considered to have suitability for roosting bats. Although no specific Potential Roosting Features (PRF) were identified during the initial scoping survey, it was acknowledged that the woodlands provided features of old growth often associated with roosting bats. As such, the woodlands were perceived to have suitability for roosting bats as a precautionary approach (trees should be inspected on a tree-by-tree basis once proposal designs are complete). Common pipistrelle (*Pipistrellus pipistrellus*) and Soprano pipistrelle (*Pipistrellus pygmaeus*) have been recorded within 5km of the Survey Area. Both are crevice dwelling bat species that may use small PRFs within the trees on-site for roosting. It was identified that there were constraints to a ground-level inspection due to the density of the canopy and ground vegetation. Thus, it is likely that a climbed inspection will be required during further survey work.

Built structures within the Survey Area predominantly comprised of in-use residential and commercial buildings. If works are proposed to any existing built structure as part of the proposed development, a PRA of the built structure will be required.

The entirety of the Survey Area was also surveyed for suitability for foraging/commuting bats. The Survey Area is comprised of a matrix of invertebrate-rich habitats suitable for bat foraging, including grassland, heathland, scrub woodland, residential plots and Loch Linnhe. The Survey Area is surrounded by a range of high-quality habitats, particularly native coniferous woodland. Therefore, suitability for foraging/commuting bats was considered to be high.

3.2.2.3 Birds

The Survey Area supports several habitat types which are considered to be suitable for the associated bird species, including broadleaved woodland, coniferous woodland, heathland, amenity grassland and coastal margins. The potential for the proposals to impact upon protected bird species has already been identified early on in the planning process. As such, a Breeding Bird Survey was carried out by Atmos Consulting Limited in the summer of 2022. The survey report should be referenced for information on ecological constraints in relation to ornithology.

3.2.2.4 Invertebrates

Common hawker (*Aeshna juncea*) were identified within the grazing pasture west of Zone 4. No protected invertebrate species were identified during the suite survey. However, Moss

carder bee (*Bombus muscorum subsp. celticus*), a UK BAP invertebrate species, has been previously identified immediately adjacent to the southwestern boundary of Zone 4. However, habitats within Zone 4 are considered to be largely unsuitable for the species due to their sub-urban nature. Habitats within the Survey Area are not considered to be unique or of particularly high quality for invertebrates within the wider locality. As such, the project is unlikely to have any long-term impact upon local populations of invertebrates.

3.2.2.5 Reptiles

No reptiles, or evidence of reptiles, were identified during the site survey. However, Slow-worm (*Anguis fragilis*) and Common lizard (*Zootoca vivipara*) have been previously recorded within 5km of the Survey Area. Habitats within the Survey Area, including grassland, heathland, scrub and woodland are considered to provide a suitable habitat mosaic to the support populations of common and widespread reptilian species, such as Slow-worm.

A large area of Rhododendron (Rhododendron ponticum) scrub has recently been cleared within Zone 3. The clearance of an invasive scrub is likely to decrease shading and promote the growth of locally native flora. Thus, there is the potential for heathland habitat to become more favourable to reptiles. If construction works are to take place within Zone 3, there will be a need to resurvey the area to inform whether the habitat has suitability for reptiles, particularly Adder (*Vipera berus*).

3.2.2.6 Badger

There are records of Badger (*Meles meles*) within 5km of the site. The substrate within the woodland in Zone 1 was heavily waterlogged, and so was considered to be sub-optimal for sett building. Nonetheless, there is potential for Badger to forage/commute through the site. Suspected snuffle holes were identified within the broadleaved woodland in Zone 1 by an observer during the Breeding Bird Survey in March 2022. Mammal trails were noted within the dense ground vegetation during the Extended Phase 1 Habitat Survey, however no setts, day beds, latrines, foraging signs, scratching posts, hair or footprints were identified. The site survey was undertaken during August, which is considered to be sub-optimal for Badger survey due to the density of the ground vegetation and a reduction in Badger activity. It is therefore recommended that further species survey work take place during the optimal time period (October to April) for disturbance in Zone 1. The Badger Survey should also incorporate the small pockets of woodland within Zones 2 and 3 which were inaccessible during the site survey. These woodlands are well connected to high quality habitats within the wider locality and may provide suitable refuge for sett building.

3.2.2.7 Hedgehog

No Hedgehog (*Erinaceus europaeus*), or evidence of Hedgehog, was identified during the site survey. However, the species are known to be present within the local area. Habitats within the Survey Area, including woodland, amenity grassland and residential gardens are considered to provide a suitable habitat mosaic to support a population of Hedgehog.

3.2.2.8 Otter

There are records of Otter (*Lutra lutra*) within 500m of the Survey Area, however no Otter, or evidence of Otter, was identified during the site survey. Otter are known to be present in the area (confirmed sighting from local residents). Habitats within the Survey Area are not considered to be suitable to support a holt, due to lack of suitable habitat above high tide.

However, Otter may use the coastal margins as a layup. Otter likely use the coastal habitats spontaneously for foraging/commuting.

3.2.2.9 Pine Marten

No Pine marten (*Martes martes*), or evidence of Pine marten, was identified during the site survey. There are, however, records of Pine Marten within 500m of the Survey Area. The broadleaved woodland in Zone 1 and the smaller pockets of broadleaved and coniferous woodland in Zones 2 and 3 are considered to provide suitability to support Pine marten, when taking into consideration the larger habitat mosaic within the wider locality.

3.2.2.10 Red Squirrel

No Red squirrel (*Sciurus vulgaris*), footprints, feeding signs or dreys were identified during the site survey. However, there are records of Red squirrel within the broadleaved woodland in Zone 1. The broadleaved woodland in Zone 1 and the smaller pockets of broadleaved and coniferous woodland in Zones 2 and 3 are considered to provide suitability to support Red squirrel, when taking into consideration the larger habitat mosaic within the wider locality. In particular, it is likely that Red squirrel utilise the woodland in Zone 1 in conjunction with the coniferous woodland situated on the other side of the A82. Species record notes state that the species have been observed running across the A82 between the two woodland blocks.

3.2.2.11 Scottish Wildcat

There are records of Scottish wildcat within 5km of the Survey Area, however no evidence of Scottish wildcat (*Felix silvestris*) was identified during the site survey. Suitable habitat within the Survey Area is small in size and fragmented from any high-quality habitat by urban development, including busy roads (such as the A82) and residential and commercial structures. Therefore, it would be considered justifiable to assume that Scottish wildcat are absent from the Survey Area.

3.2.2.12 Water Vole

There are no known records of Water vole (*Arvicola amphibius*) within 5km of the Survey Area. Furthermore, no suitable watercourses or drains were identified within the Survey Area to provide suitable habitat to support Water vole. Based on the lack of suitable habitat it would be considered justifiable to assume that Water Vole are not present within the Survey Area.

3.2.2.13 Common and Widespread Terrestrial Mammals

The Survey Area supports a range of different habitats suitable to support populations of common and widespread terrestrial mammals, such as Rabbit (*Oryctolagus cuniculus*). Furthermore, habitats within Zone 3 were considered to be suitable to support Mountain Hare (*Lepus timidus*) which has been recorded within 5m of the Survey Area.

3.2.2.14 Protected Plant Species

Habitats within Zone 3 are known to support Lesser butterfly-orchid (*Platanthera bifolia*).. However, Lesser butterfly-orchid was not identified during the site survey. Heathland habitat within the area is considered to be suitable for the species. Although, the area has become heavily encroached by Rhododendron (*Rhododendron ponticum*) scrub which is likely to have increased shading and degraded the former habitat.

3.2.3 Invasive Species

3.2.3.1 Japanese Knotweed

A large patch of Japanese Knotweed (*Fallopia japonica*) was identified within the broadleaved woodland in Zone 1 (Target Note TN7; drawing 99_DRG_03_1. The patch was formerly identified during the Breeding Bird Survey, undertaken by Atmos. Japanese Knotweed is an INNS listed in Section 9 of the Wildlife and Countryside Act 1981 (as amended). The species is considered to be highly invasive and can have considerable impact upon hard infrastructure.

3.2.3.2 Rhododendron

Rhododendron (*Rhododendron ponticum*) is present throughout much of the Survey Area and has become established within several different habitats, including broadleaved woodland, coniferous woodland, scrub and heathland. Where present, the species dominates the ground-flora and has likely impacted upon former biodiversity. Rhododendron is an INNS listed in Section 9 of the Wildlife and Countryside Act 1981 (as amended).

A large area, previously dominated by Rhododendron, has recently been cleared to manage the INNS (Target Note TN11; depicted as J5 on drawing 99_DRG_03_01). The habitat was once a matrix of dry dwarf heath and introduced shrub (Rhododendron). It is hoped that the clearance will promote a growth of native flora and have a positive impact upon local biodiversity.

4 Discussion

The Extended Phase 1 Habitat Survey was undertaken in order to scope the Survey Area for potential ecological constraints to re-development in the area. As such, ecological features requiring further survey work within different zones (Zones 1, 2, 3 and 4) are provided to help inform upon suitable locations for re-development. Recommendations in relation to each survey Zone are provided below.

4.1 Zone 1

R1 A Badger Walkover Survey of the broadleaved woodland should be undertaken by a suitably qualified ecologist during an appropriate season (October – April).

R2 A Terrestrial Mammal Survey of the broadleaved woodland should be undertaken by a suitably qualified ecologist to determine the presence and distribution of Red squirrel and Pine marten (if any).

R3 A Preliminary Bat Roost Assessment (PRA) of individual trees requiring tree works (including removal) should be undertaken by a suitably qualified ecologist. Due to the complexity of the woodland and constraints of a ground-level inspection, a climbed inspection may be required. Potential Roost Features (PRF) should be inspected by endoscope by a suitably licenced bat worker.

R4 An Invasive Non-Native Species Management Plan (INNSMP) for Japanese Knotweed should be put in place and implemented with a matter of urgency.

R5 Otter are likely to utilise coastal margins spontaneously for foraging, commuting and potentially, as a layup. Therefore, suitable mitigation strategies to protect the species

should be produced. This should include a pre-construction survey to check for resting places and mitigation to avoid physical harm.

4.2 Zone 2

R1 A Badger Walkover Survey of the small pockets of broadleaved and coniferous woodland should be undertaken by a suitably qualified ecologist during an appropriate season (October – April).

R2 A Terrestrial Mammal Survey of the small pockets of broadleaved and coniferous woodland should be undertaken by a suitably qualified ecologist to determine the presence and distribution of Red squirrel and Pine marten (if any).

R3 A PRA of individual trees requiring tree works (including removal) should be undertaken by a suitably qualified ecologist. Due to the complexity of the woodland and constraints of a ground-level inspection, a climbed inspection may be required. PRFs should be inspected by endoscope by a suitably licenced bat worker.

R5 Otter are likely to utilise coastal margins spontaneously for foraging, commuting and potentially, as a layup. Therefore, suitable mitigation strategies to protect the species should be determined. This should include a pre-construction survey to check for holts

R6 An INNSMP for Rhododendron should be put in place to clear the Rhododendron from site, which will help promote the growth of native flora and provide a positive contribution to biodiversity net gain.

4.3 Zone 3

R7 An updated Extended Phase 1 Habitat Survey of the area should be undertaken by a suitably qualified ecologist prior to final project design as the existing habitats are likely to change as a result of recent clearance of the site. The updated PEAR should outline further survey work (if required).

R8 National Vegetation Communities (NVC) Surveys would be advisable to determine whether the habitat still support Lesser butterfly-orchid. Rhododendron clearance is likely to enhance the existing habitat to make it more suitable for Lesser butterfly-orchid. However, care should be taken when choosing suitable pesticides for clearance that is does not impact the protected species.

4.4 Zone 4

R6 An INNSMP for Rhododendron should be put in place to clear the Rhododendron from site, which will help promote the growth of native flora and provide a positive contribution to biodiversity net gain.

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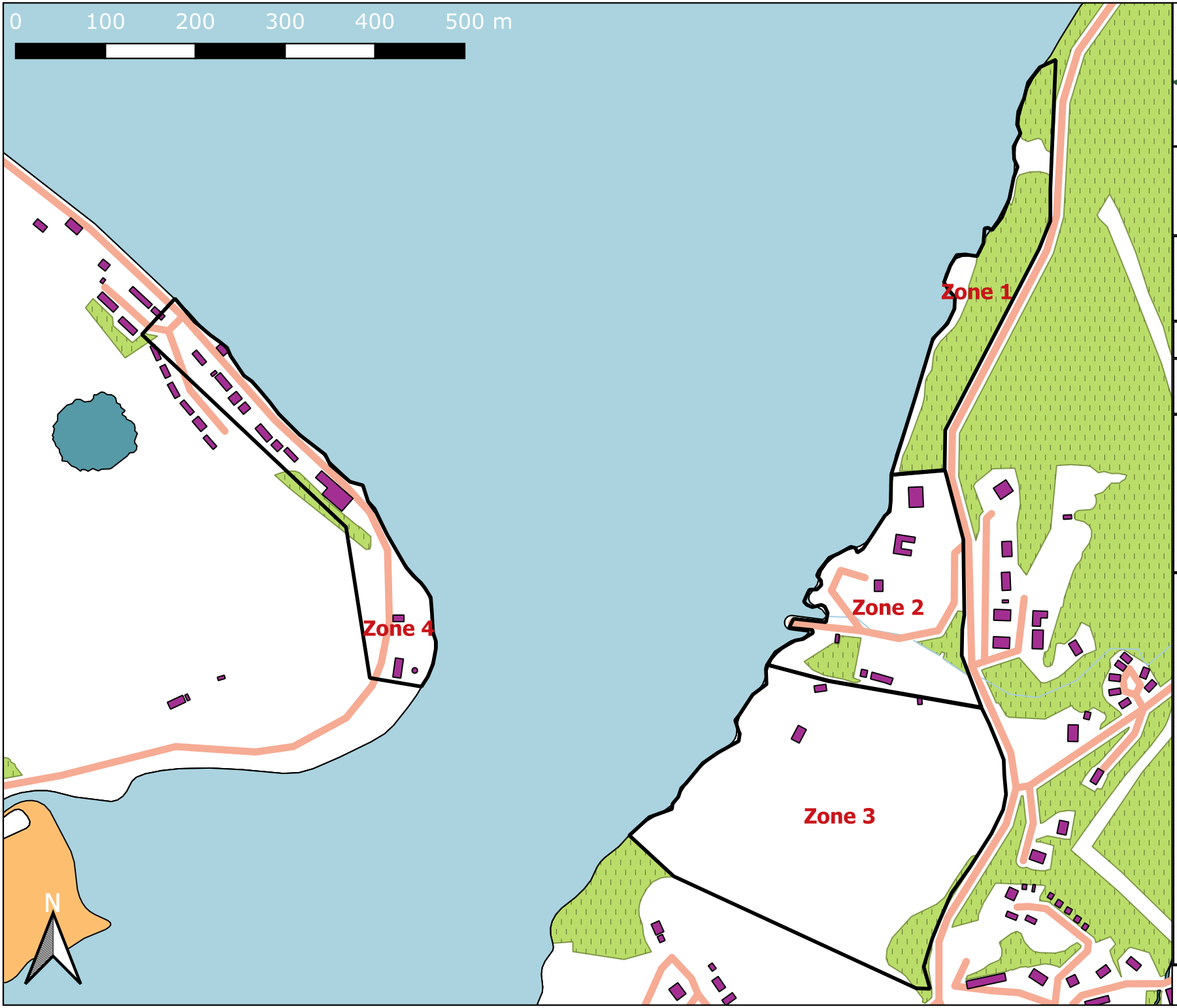
6 Glossary

Table 6.1: Glossary of terms used within the report

Acronym	Definition
BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BoCC	Birds of Conservation Concern
CIEEM	Chartered Institute of Ecology and Environmental Management
INNS	Invasive Non-Native Species
INNSMP	Invasive Non-Native Species Management Plan
JNCC	Joint Nature Conservation Committee
NBN	National Biodiversity Network
PEA	Preliminary Ecological Appraisal
PEAR	Preliminary Ecological Appraisal Report
PRA	Preliminary Bat Roost Assessment
PRF	Potential Roost Feature
SSSI	Site of Special Scientific Interest
SAC	Special Area of Conservation
SPA	Special Protection Area
THC	The Highland Council
QGIS	Quantum Geographic Information System

Appendix 1: Drawings



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99_DRG_02_1: Survey Area

Projection: OSGB 1936/British National Grid EPSG: 27700

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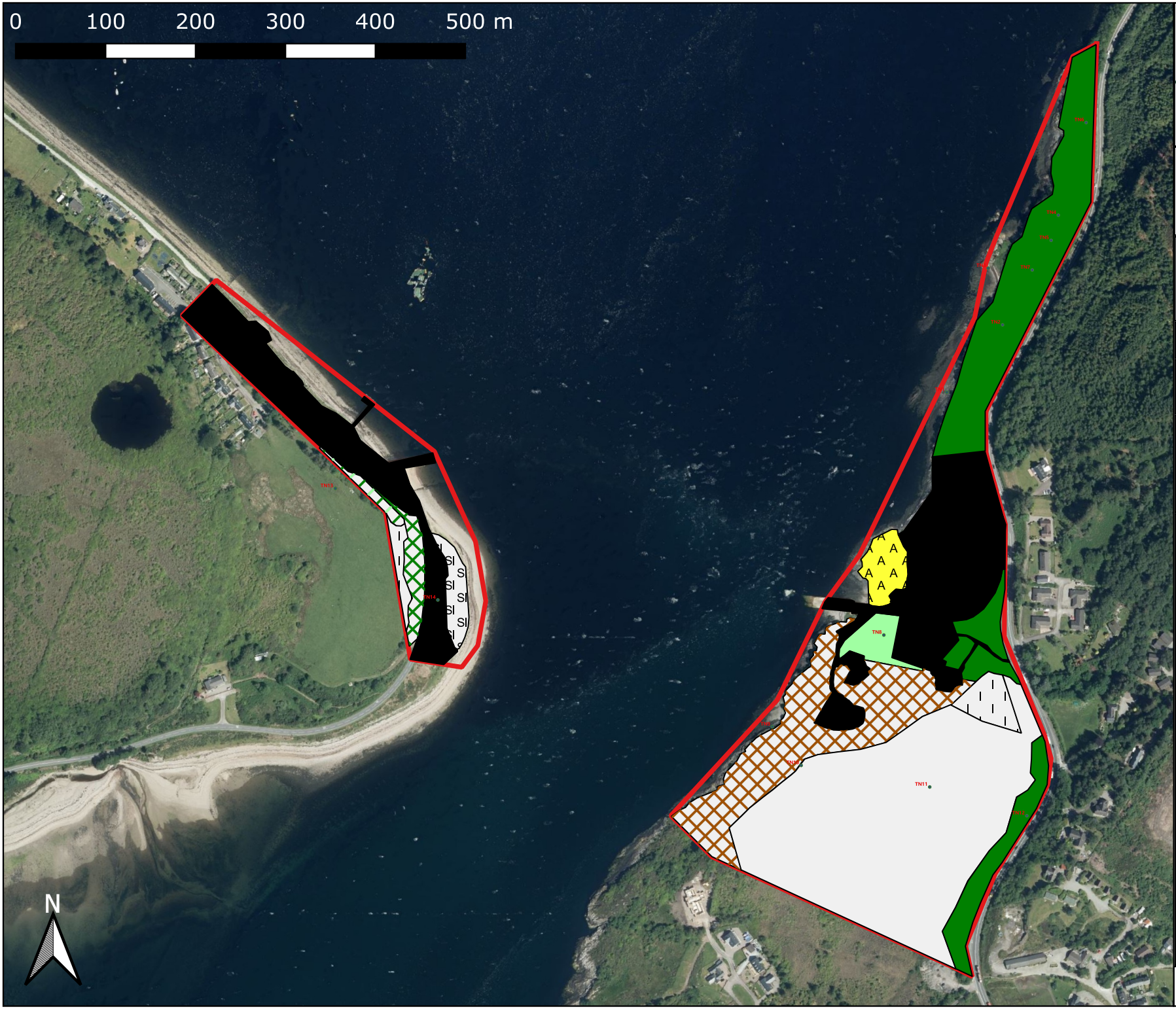
Open Streetmap "Base map and data from OpenStreetMap and OpenStreetMapFoundation".

Legend

- Buildings
- Foreshore
- Fresh Water
- Roads
- Tidal Water
- Woodland
- Zone 1
- Zone 2
- Zone 3
- Zone 4



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99_DRG_03_1: Site Habitat Map

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Legend

Habitats

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.2.1 - Coniferous woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- B4 - Improved grassland
- B6 - Poor semi - improved grassland
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.4 - Introduced shrub
- J3.6 - Buildings
- J5 - Other habitat
- Target Notes PEA
- Survey Area

Appendix 2: Target Notes

Table A2.1: Target notes recorded during the Extended Phase 1 Habitat Survey on the 23rd August 2022

Target Note No.	Easting	Northing	Description
TN1	202245	763783	Rocks slippery due to seaweed and heavy rain largely inaccessible
TN2	202307	763858	Large patch of Rhododendron
TN3	202291	763921	Cormorant identified on rocks
TN4	202369	763980	Mature Sycamore
TN5	202361	763952	Alder with Bracken understorey
TN6	202400	764083	Scattered Scots pine present
TN7	202340	763919	Large patch of Japanese knotweed spreading westwards
TN8	202175	763513	Woodland inaccessible due to Rhododendron shrub
TN9	202051	763411	Rocks slippery due to seaweed and heavy rain largely inaccessible
TN10	202083	763368	Steep incline difficult to climb due to rain and heathland vegetation
TN11	202226	763344	Rhododendron clearance recently taken place. Grasses starting to grow through dead vegetation
TN12	202334	763312	Linear feature of woodland inaccessible due to dense Bramble scrub
TN13	201565	763676	Offsite grazing pasture with patches of Juncus
TN14	201679	763552	Disused building with potential bat suitability

Appendix 3. Breeding Bird Survey Report

atmos CONSULTING

Corran Ferry
19410

Technical Report

Corran Ferry

Breeding Bird Survey

Affric limited

Affric making it happen

September 2022

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Version	Date	Reason
1.1	14/09/2022	Draft for internal review
1.2	19/09/2022	Client issue

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1 Introduction

1.1 Terms of Reference

Atmos Consulting Ltd. was commissioned by Affric Limited on behalf of Highland Council to undertake a breeding bird survey at Corran Narrows, Corran, Scottish Highlands (hereafter referred to as the "Site").

1.2 Site Location and Description

The Site is located on either side of the Corran Narrows, the narrowest point of Loch Linnhe, approximately 13km south-west of Fort William. The Site comprises two sections: one on the western side of the Corran Narrows at Corran Ferry Port, and another on the eastern side at Ardgour Ferry Terminal. The Site boundary of the Corran section extends from Corran Point north-west along the A861 and includes much of the Corran settlement. The Site boundary of the Ardgour section incorporates land between the waters of Loch Linnhe and the A82, extending north from Blàr Moine to Poll a' Phloid.

1.3 Objectives

The objectives of this report are to:

- Summarise the avian desk study information obtained to date for the Site; and
- Document the ornithological survey methodologies and avian species recorded.

1.4 Proposed Development

The proposed scheme is for expansion of the Corran and Ardgour ferry port facilities.

2 Methodology

2.1 Desktop Study

2.1.1 Designated Sites

The desktop study consisted of a search for statutory and non-statutory designated Sites with avian qualifying features within 10km of the Site, as well as a data review for sources of information relating to bird populations on and within the vicinity. Various data sources were utilised including the website of the statutory agency, NatureScot via the "Site Link Portal" (https://sitelink.nature.scot/home).

2.1.2 Species Records

A search of publicly available records within 2km of the Site was undertaken using various data sources including datasets freely available for commercial use held on the National Biodiversity Network (NBN) Atlas website (https://data.nbn.org.uk).

2.2 Survey Methodologies

Survey methodologies were in accordance with SNH (2017b) guidance as well as survey methodologies described in Gilbert *et al*. (1998) and Hardey *et al*. (2013).

All surveys were carried out by experienced ornithological surveyors who hold NatureScot Schedule 1 bird licences.

2.2.1 Breeding Bird Survey

A breeding bird survey was carried out using the Brown & Shepherd breeding bird survey method (Brown & Shepherd, 1993). This technique is used to census upland breeding waders such as golden plover *Pluvialis apricaria*, dunlin *Calidris alpina*, greenshank *Tringa nebularia* and other species of open upland moor, but can be used in a residential / agricultural setting to record all species and provides a reliable estimate for most species.

Surveys were undertaken between April and June, avoiding high winds and other unfavourable weather conditions. The method is based on a constant search effort, allowing 20 to 25 minutes per 500 x 500m quadrat of open land. A predetermined route through each quadrat was followed so that all areas of each quadrat were approached to within at least 100m, with the surveys taking place between 08:30 and 18:00, in accordance with the guidelines.

The behaviour and location of each individual bird was recorded on a 1:25,000 scale map, using standard BTO codes. Records from each survey were combined into a final visit map, so that duplicate records of the same birds could be removed.

Birds were assumed to be breeding or holding a territory (confirmed breeding) at a location if one or more of the following was recorded:

- Presence of a nest, eggs or young (including newly fledged); and / or
- A bird was observed carrying food or breeding material.

In the absence of either of these indicative behaviours, birds were classified as probable breeding if one or more of the following was recorded:

- Courtship, displaying or singing in the same location on more than one visit;
- Agitated behaviour including alarm calls or distraction display; and / or
- Territorial disputes.

In the absence of any of the above indicative behaviours, birds were classified as possible breeding if one or more of the following was recorded:

- Singing or displaying on one visit;
- A pair in suitable habitat; and / or
- Birds reacting antagonistically on one visit.

Other records were considered to be of non-breeding birds.

2.3 Survey Limitations

Surveys were undertaken at a suitable time of year and under suitable weather conditions and no limitations have been identified in this regard.

3 Results

3.1 Desk Study

3.1.1 Designated Sites

Statutory Designations

There are two designated sites with avian qualifying features in the vicinity (< 10km) of the proposed development (Table 1 refers).

Table 1: Designated Sites

Designated Site	Designated Feature	Distance from Site Boundary
Special Protection Areas (SPA)		
Moidary and Ardgour (NatureScot, 2010)	Golden Eagle *Aquila chrysaetos*	Approximately 1.5km to the north-west
Glen Etive and Glen Fyne (NatureScot, 2010)	Golden Eagle *Aquila chrysaetos*	Approximately 3.75km to the south-east

3.1.2 Species Records

A search of the NBN Atlas (undertaken under licence OGL, CC-BY-NC) for the last 10 years within a 2km radius of the proposed development showed records for six species (Table 2 refers) that are listed either on:

- Annex I of the EC Birds Directive (2009/147/EC);
- Schedule 1 of the Wildlife and Countryside Act 1981 (as amended); or
- Red or Amber lists of Birds of Conservation Concern 5 (BoCC 5) (Stanbury *et al.*, 2021).

Table 2: Recorded Bird Species (data from NBN Atlas)

Species[1]	Annex I	Schedule 1	Red list (BoCC 5)	Amber list (BoCC 5)
Dunnock *Prunella modularis* [1]				X
House sparrow *Passer domesticus* [1]			X	
Wren *Troglodytes troglodytes* [1]				X
Black guillemot *Cepphus grille* [1]				X
Herring gull *Larus argentatus* [1]			X	
Willow warbler *Phylloscopus trochilus* [1]				X

[1] Data sourced from Birds (BTO / JNCC / RSPB Partnership)

3.2 Breeding Bird Survey

Three Brown and Shepherd visits were carried out as detailed in Table 3. The study area for this survey included the site boundary plus a 200m buffer (access permitting) (Appendix A, Figure 1 refers).

Table 3: Moorland Breeding Bird Survey Effort 2020

Visit Number	Date	Observer	Start time	Stop time	Duration
1	23/06/2022	Alexander Kennard	09:30	13:30	4hrs
2	12/07/2022	Alexander Kennard	10:00	14:30	4hrs 30mins
3	27/07/2022	Alexander Kennard	09:50	13:20	3hrs 30mins

During the breeding bird survey, a total of 42 species were recorded (Appendix A, Figure 1 refers). Table 4 presents, alphabetically, each of the species in terms of their conservation value and breeding status at the Site.

Table 4: Breeding Bird Survey Recorded Species

BTO Code	Common Name	Scientific Name	EU Birds Directive: Annex I	Schedule 1 Wildlife & Countryside Act 1981	Scottish Biodiversity List (SBL)	Birds of Conservation Concern (BoCC)	Breeding Status and number of territories (possible, probable, confirmed or non-breeding)
AE	Arctic tern	*Sterna paradisaea*	X		X	Amber	Non-breeding (1)
TY	Black guillemot	*Cepphus grylle*				Amber	Confirmed (1) Non-breeding (2)
B.	Blackbird	*Turdus merula*				Green	Probable (3) Possible (2)
BT	Blue Tit	*Cyanistes caeruleus*				Green	Possible (2)
CG	Canada goose	*Branta canadensis*				Introduced	Non-breeding (2)
C.	Carrion crow	*Corvus corone*				Green	Probable (1)
CH	Chaffinch	*Fringilla coelebs*				Green	Probable (3)
CT	Coal tit	*Periparus ater*				Green	Probable (1) Possible (1)
CD	Collared dove	*Streptopelia decaocto*				Green	Possible (1)
CM	Common gull	*Larus canus*				Amber	Probable (2) Possible (2) Non-breeding (4)
CS	Common sandpiper	*Actitis hypoleucos*				Amber	Possible (2)
CN	Common tern	*Sterna hirundo*	X		X	Amber	Non-breeding (2)
E.	Eider	*Somateria mollissima*				Amber	Possible (1) Non-breeding (4)
GC	Goldcrest	*Regulus regulus*				Green	Possible (2)

BTO Code	Common Name	Scientific Name	EU Birds Directive: Annex I	Schedule 1 Wildlife & Countryside Act 1981	Scottish Biodiversity List (SBL)	Birds of Conservation Concern (BoCC)	Breeding Status and number of territories (possible, probable, confirmed or non-breeding)
GO	Goldfinch	*Carduelis carduelis*				Green	Probable (1)
GD	Goosander	*Mergus merganser*				Green	Possible (2)
GB	Great black-backed gull	*Larus marinus*				Amber	Non-breeding (1)
GT	Great tit	*Parus major*				Green	Possible (2)
GR	Greenfinch	*Chloris chloris*				Red	Probable (2) Possible (1)
H.	Grey heron	*Ardea cinerea*				Green	Non-breeding (4)
HG	Herring gull	*Larus argentatus*			X	Red	Possible (4) Non-breeding (5)
HC	Hooded crow	*Corvus cornix*			X	Green	Non-breeding (1)
HM	House martin	*Delichon urbicum*				Red	Probable (1) Non-breeding (1)
HS	House sparrow	*Passer domesticus*			X	Red	Probable (5)
LR	Lesser redpoll	*Acanthis cabaret*				Red	Probable (1)
MA	Mallard	*Anas platyrhynchos*				Amber	Non-breeding (1)
MP	Meadow pipit	*Anthus pratensis*				Amber	Probable (1)
OP	Osprey	*Pandion haliaetus*	X	X	X	Amber	Non-breeding (1)
OC	Oystercatcher	*Haematopus ostralegus*				Amber	Probable (1) Possible (3) Non-breeding (2)
PF	Pied wagtail	*Motacilla alba*				Green	Probable (3)
RA	Razorbill	*Alca torda*				Green	Non-breeding (2)
R.	Robin	*Erithacus rubecula*				Green	Probable (4) Possible (1)
RC	Rock pipit	*Anthus petrosus*				Green	Possible (1)
RO	Rook	*Corvus frugilegus*				Amber	Possible (1)
SI	Siskin	*Carduelis spinus*			X	Green	Possible (1)
SF	Spotted flycatcher	*Muscicapa striata*			X	Red	Possible (1)
SG	Starling	*Sturnus vulgaris*			X	Red	Probable (1)
SL	Swallow	*Hirundo rustica*				Green	Possible (1)
W.	Wheatear	*Oenanthe oenanthe*				Amber	Possible (1)
WW	Willow warbler	*Phylloscopus trochilus*				Amber	Probable (5) Possible (2) Non-breeding (1)
WP	Woodpigeon	*Columba palumbus*				Amber	Probable (2) Non-breeding (1)

BTO Code	Common Name	Scientific Name	EU Birds Directive: Annex I	Schedule 1 Wildlife & Countryside Act 1981	Scottish Biodiversity List (SBL)	Birds of Conservation Concern (BoCC)	Breeding Status and number of territories (possible, probable, confirmed or non-breeding)
WR	Wren	*Troglodytes troglodytes*			X	Red	Probable (4)

4 Discussion & Mitigation

Three species recorded on site are Annex I listed species: arctic tern, common tern and osprey. However, all observations were identified as non-breeding individuals. Therefore no specific mitigation is required.

All wild birds are protected by law whereby for any wild bird species, it is an offence to intentionally or recklessly:

- kill, injure or take a bird
- take, damage, destroy or interfere with a nest of any bird while it is in use or being built
- obstruct or prevent any bird from using its nest
- take or destroy an egg of any bird

If further works are required during the bird breeding season (considered to be March to August, inclusive), the following measures are recommended in order to minimise any potential impact on breeding birds within the Site:

- A breeding bird survey should be undertaken prior to construction commencing.
- A toolbox talk on breeding birds should be given to all site staff before works commence.
- Site staff should stay vigilant for the presence of nests especially in areas of thick scrub as well as any breeding bird behaviour including birds carrying food, nesting materials, alarm calling or making distraction displays.
- The working footprint will be limited to the minimum required to undertake the works and all vehicles will keep to designated routes.
- Any materials or machinery left overnight should be checked at the start of each day for the presence of breeding or recently fledged birds.
- If any nests are located within the footprint of the works, all works within that area should cease and an Ecologist contacted for advice.
- In the event a nest is identified, an exclusion zone should be established appropriate to the species and after taking advice from an Ecologist – generally the exclusion zone will be 5 – 10m for non Schedule 1 birds. Such exclusion zones would only be required while the nest is considered "active".

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Appendices

Appendix A. Figures

Figure 1 - Breeding Bird Survey Results

Corran Ferry

Figure 1
Breeding Bird Survey Results

Key

Site boundary

Survey area - 250m buffer

Category

Schedule 1/Annex 1

Scottish Priority Species

Not designated

Breeding Status

Confirmed

Probable

Possible

Non-breeding

202000

764000

763000

PW

Corran

Camas nam Faochag

Camas Bun an Uillt

Corran Narrows

Blar Moine

Inchree

Tòrr nam Foidean

A861

A82

RIGH CRESCENT

0 100 200

Meters

N

Scale @ A3:
1:5,500

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01/09/2022 19410/OR/001a

Drawn by: JT Checked by: TH Approved by: JW

Appendix 4. Protected Species Survey Report

Corran Ferry Infrastructure Improvement Scheme

Protected Species Survey

Report No. 99_REP_09_1

Body Document only. Appendices can be provided on request.

Date: 16/04/2024

Document Control

	Name	Title	Signature	Date
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Executive Summary

- A Protected Species Survey (PSS) for bats, badger, pine marten, red squirrel and otter was carried out by competent and experienced ecologists on the 24th May and the 16th August 2023;
- The results of the survey determined that there is the potential for roosting bats within broadleaved trees situated within the Nether Lochaber survey area and within the Lighthouse Store situated within the Ardgour survey area;
- Suitable habitat for badger was identified within the Nether Lochaber and Ardgour survey areas, however, no evidence of the species was identified;
- Suitable den sites for pine marten were identified within the Nether Lochaber survey area however, no definitive evidence of the species was identified;
- Suitable foraging habitat for red squirrel was identified within the Nether Lochaber survey area however, no evidence of the species was identified;
- Spraints and otter footprints confirmed the presence of the species within the Nether Lochaber and Ardgour survey areas. Potential otter holts, couches and layups were found within coastal margins of the Nether Lochaber and Ardgour survey areas;
- Patches of native bluebell were identified in the broadleaved woodland within the Nether Lochaber survey area;
- Two potential hibernacula for amphibians and reptiles were identified in the broadleaved woodland within the Nether Lochaber survey area; and
- Further survey work for bats, pine marten and otter has been recommended.

Table 0.1: Drawings Referenced within the Protected Species Survey Report

Drawing Number	Comments
99_DRG_03_1	Phase 1 Habitat Map produced during the Preliminary Ecological Appraisal (PEA).
99_DRG_11_1	Shows the approximate survey areas for each of the target species and the locations of target notes in Nether Lochaber.
99_DRG_12_1	Shows the approximate survey areas for each of the target species and the locations of target notes in Ardgour.

1 Introduction

The Highland Council (THC) are proposing to upgrade the existing ferry terminals at the Corran Narrows under the Corran Ferry Infrastructure Improvement Scheme (CFIIS). The CFIIS will involve the replacement of the existing ferry with up to two electric vessels along with associated new infrastructure in the villages of Ardgour and Nether Lochaber. The detailed designs of the development proposals have yet to be formalised.

Wallace Stone, as the principal engineering consultants to THC, have appointed Affric Limited (Affric) to undertake a Protected Species Survey (PSS) of the proposed development footprint of the CFIIS in order to determine the presence/likely absence of terrestrial ecological receptors, previously identified during the Preliminary Ecological Appraisal (PEA) (Affric, 2023). The PSS targeted bats (*Chiroptera spp*.), badger (*Meles meles*), pine marten (*Martes martes*), red squirrel (*Sciurus vulgaris*) and otter (*Lutra lutra*) and made note of any other protected species identified opportunistically.

The PSS will succeed information provided within the PEA, with regards to the target species (i.e., bats, badger, pine marten, red squirrel, and otter).

1.1 Survey Site Description

The survey site is comprised of two separate land parcels which run alongside either side of Loch Linnhe, through the villages of Nether Lochaber and Ardgour. These land parcels will hereafter be referred to as the Nether Lochaber and Ardgour survey areas (as shown in Drawings 99_DRG_11_1; and 99_DRG_12_1). As these land parcels are separated by a significant barrier which is impenetrable by most terrestrial species (Loch Linnhe) the two survey areas will be considered separately, with the exception of otter.

Both the Nether Lochaber and Ardgour survey areas incorporate habitats and infrastructure associated with a coastal village. The Nether Lochaber survey area is comprised, in-part, by a sub-urban landscape made up of residential and commercial buildings with associated hard and soft landscaping. In the surrounding areas, plant communities associated with woodland, grassland, scrub, and heathland habitats are present (see Drawing 99_DRG_03_1; and Affric, 2022). The Ardgour survey area is predominantly sub-urban, due to existing residential and commercial development although coastal margins and arable farmland provide semi-natural habitat (see Drawing 99_DRG_03_1; and Affric, 2022).

Unfortunately, invasive non-native species (INNS) have been recorded in both the Nether Lochaber and Ardgour survey areas. Rhododendron (*Rhododendron ponticum)* has become a significant problem within both the Nether Lochaber and Ardgour survey areas, dominating much of the existing habitats. Japanese knotweed (*Fallopia japonica*) has also been identified within the broadleaved woodland within the Nether Lochaber survey area (see Affric, 2022).

For further detail on the habitats situated within the survey areas, please refer to the Phase 1 Habitat Map and corresponding PEA Report (Drawing 99_DRG_03_1; and Affric, 2022).

1.2 Legislation and Policy

Otter and all bat species found naturally in Scotland are European Protected Species (EPS), and therefore receive full protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (hereafter referred to as the 'Habitat Regulations'). In addition, six species of bat are listed within the 'Highland Nature Biodiversity Action Plan 2021 – 2026' (HNBAP)

(THC, *et al*., 2022) including brown long-eared bat (*Plecotus auritus*), Daubenton's bat (*Myotis daubentonii*), natterer's bat (*Myotis nattereri*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and Nathusius' pipistrelle (*Pipistrellus nathusii*).

Badgers are a protected species under The Protection of Badgers Act 1992 as amended by the Wildlife and Natural Environment (Scotland) Act 2011.

Pine marten and red squirrels are protected under the Wildlife and Countryside Act 1981 (as amended). Both of these species are also listed within the Highland Nature Biodiversity Action Plan (HNBAP) (THC, *et al*., 2022).

For further details on relevant legislation, please refer to Appendix 2.

2 Methodology

2.1 Desktop Study

A data collection exercise (desktop study) for protected species was undertaken as part of the PEA process in August 2022 (Affric, 2022) during which, data was obtained from a variety of sources. Information on statutory sites including location, citations and conservation objectives was obtained from NatureScot's online portal 'SiteLink' (NatureScot, 2023). Commercially available records of protected species identified within the survey site and a reasonable commuting distance were obtained from the National Biodiversity Network (NBN) Atlas (NBN, 2023). Aerial photography from Google Maps was also utilised allow for an assessment of potential connectivity (Google, 2023).

A data search for records of each species was undertaken for the site and a 2km buffer, although where no records were inspected, a search was conducted up to 5km to gain further understanding of the wider locality.

As the results of the desktop study are greater than 12 months old, a review was undertaken to check for updated available ecological data of the target species during the interim (Chartered Institute of Ecology and Environmental Management (CIEEM), 2019). No new data records were identified thus, the desktop study within the PEA remains accurate and current. As such, an overview of the information identified during the PEA for the species associated with this report is provided in Section 3. For further information please refer to the PEA report (Affric, 2022).

2.2 Site Survey

A site survey for bats, badger, pine marten and red squirrel was carried out on 24th May 2023 and 16th August 2023. An otter survey was carried out on 24th May 2023. Surveys were carried out by appropriately competent and experienced ecologists.

The PSS was carried out within all suitable habitats for the target species (i.e., bats, badger, pine marten, red squirrel, and otter) within the proposed development footprint of the CFIIS and appropriate species-specific buffer zones (see Table 2.1). Where evidence of the target species, or potential features suitable for the target species, were identified, they were recorded and mapped as target notes (see Drawings 99_DRG_11_1; and 99_DRG_12_1). Evidence of target species identified outwith the species-specific buffer zone was still recorded

and mapped as target notes in order to provide additional context to the spatial distribution of the species.

Evidence of any other protected species identified during the survey was also recorded and mapped as target notes in order to ensure the survey areas were represented accurately.

Table 2.1: Species-specific Survey Areas During the Protected Species Survey on the 28th May and 16th August 2023 (as Shown in Drawings 99_DRG_11_1; and 99_DRG_12_1)

Receptor	Buffer zone	Survey area descriptor
Bats	Nether Lochaber and Ardgour survey areas and a 30m buffer zone.	Nether Lochaber and Ardgour bat survey areas.
Badger	Nether Lochaber and Ardgour survey areas and a 100m buffer zone.	Nether Lochaber and Ardgour badger survey areas.
Pine marten	Nether Lochaber and Ardgour survey areas and a 250m buffer zone.	Nether Lochaber and Ardgour pine marten survey areas.
Red squirrel	Nether Lochaber and Ardgour survey areas and a 50m buffer zone.	Nether Lochaber and Ardgour red squirrel survey areas.
Otter	Nether Lochaber and Ardgour survey areas and a 200m buffer zone.	Nether Lochaber and Ardgour otter survey areas.

2.2.1 Bats

A Preliminary Roost Assessment (PRA) for bats was undertaken as per the Bat Conservation Trust's (BCT) 'Bat Surveys for Professional Ecologists: Good Practice Guidelines' (Collins, 2016) (as at the time of survey, this was the most current BCT guidance). The PRA was comprised of a ground-level inspection of the trees and built structures within the Nether Lochaber and Ardgour bat survey areas (see Drawings 99_DRG_11_1; and 99_DRG_12_1).

During the PRA of the trees, the surveyor walked transects through the woods, recording any PRFs identified.

The inspection of the Lighthouse Store, involved a detailed external and internal inspection of the structure to identify potential bat entry/exit points, potential roosting location and evidence of bats, such as droppings, urine stains and foraging remains.

The suitability of trees and built structures to support roosting bats was assessed as per Table 2.2. Trees and/or buildings identified to have PRFs were recorded and mapped (see Drawings 99_DRG_11_1; and 99_DRG_12_1), including photographs, location, and description. As no bat droppings were identified during the PSS, no data was sent for eDNA analysis.

The PRA also included an assessment for the likeliness for foraging/commuting bats (as per Table 2.2). The assessment for foraging/commuting bats included an evaluation on available habitat, connectivity, and local species records (where appropriate).

Table 2.2: Assessment Criteria for Suitability of Habitats for Bats (developed from Collins, 2016)

Suitability	Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically but do not provide enough space, shelter, protection appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by a large number of bats (i.e., unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen form the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats but isolated, i.e., not very well connected to the surrounding landscape by other suitable habitat. Suitable but isolated habitat that could be used by small numbers of foraging bats.
Moderate	A structure or tree with one or more potential roost sites that could be use by bats due to their size, shelter, protection, conditions, and surrounding habitat but unlikely to support a roost of high conservation status.	Continuous habitat connected to the wider landscape that could be used by bats for commuting. Habitat that is connected to the wider landscape that could be used by bats for foraging.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger number of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions, and surrounding habitat.	Continuous, high-quality habit that is well connected to the wider landscape that is likely to be used regularly by commuting bats. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats. Site is close to and connected to known roosts.
Confirmed roost	Roost confirmed through the identification of bats within a roost or definitive signs of recent use by bats.	N/A.

New bat survey guidance was published by the BCT in September 2023 (Collins, 2023), which is taken into consideration within the conclusion and recommendations (see Section 6).

2.2.2 Badger

A site survey for badger was carried out in line with Scottish Badgers 'Surveying for Badgers, Good Practice Guidelines' (Scottish Badgers, 2018) and THC's 'Best Practice Guidance – Badger Surveys' (THC, 2006) within the Nether Lochaber and Ardgour badger survey areas (see Drawings 99_DRG_11_1; and 99_DRG_12_1). Due to the nocturnal nature of badgers, surveys

relied on the interpretation of field signs rather than direct observation of the animals themselves.

Field signs (where identified) were recorded and mapped (see Drawings 99_DRG_11_1; and 99_DRG_12_1). Field signs indicative of badger activity include:

- Setts;
- Day beds;
- Latrines;
- Signs of foraging including snuffle holes;
- Pathways;
- Scratching posts;
- Hairs; and
- Footprints.

Sett entrances, if identified, were photographed, and mapped. Each sett entrance was classified as Well Used (WU), Partially Used (PU) or Disused (D). Sett entrances were grouped where applicable and classified as a main sett, annex sett, subsidiary sett, or outlier sett, in accordance with survey guidelines (Scottish Badgers, 2018).

2.2.3 Pine Marten and Red Squirrel

A site survey for pine marten and red squirrel was undertaken as per the 'UK BAP Mammals Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation' (Cresswell, *et al*., 2012) within the Nether Lochaber and Ardgour pine marten and red squirrel survey areas (respectively) (see Drawings 99_DRG_11_1; and 99_DRG_12_1). The survey comprised of a site walkover, looking for evidence of pine marten (i.e., scats, prints and den sites) and red squirrel (i.e., animal sightings, dreys, and feeding signs, such as pinecones and caches). Evidence of either species, or features identified as having suitability to support a pine marten den and/or red squirrel drey were recorded and mapped for further investigation (see Drawings 99_DRG_11_1; and 99_DRG_12_1).

2.2.4 Otter

The otter survey was undertaken in broad accordance with the approach detailed by NatureScot's 'Standing Advice for Planning Consultations - Otters' (NatureScot, 2023), together with the guidance provided in 'Ecology of the European Otter' (Chanin, 2003). All accessible areas within the Nether Lochaber and Ardgour otter survey areas were surveyed, concentrating on coastal margins and rock armour.

Due to the often-elusive nature of otters, surveys relied on the interpretation of field signs rather than direct observation of the animals themselves. During the survey the following field signs were sought, with those which can be regarded as definitive, i.e., they provide certain confirmation of the presence of this species, marked with an asterisk:

- Spraints (faeces)*;
- Feeding remains (partially eaten prey items);
- Holts (den);
- Footprints*;
- Couches or Lay-Ups (resting place above ground); and
- Pathways and slides into water.

Field signs were recorded and mapped for further investigation (see Drawings 99_DRG_11_1; and 99_DRG_12_1).

2.3 Limitations

The PRA involved the inspection of a large number of trees, almost all of which were situated within a dense, closed-canopy broadleaved woodland. Every effort was made to inspect each individual tree, however as the survey was completed in May and August, the trees were in full leaf. Thus, there were limitations to the complete inspection of trees for PRFs which may have been hidden by foliage. This is accounted for within the final conclusions of this report. Foliage was not considered to have an impact upon the observation of red squirrel dreys, and the canopy itself could be inspected for evidence of drey building.

During surveying for otter, the small lochan at the rear of Corran Gardens (Lochan na Luireach) was inaccessible due to dense vegetation encircling it. A dry stream bed exits the lochan behind residential housing in the Nether Lochaber survey area; this terminates at a silted culvert and does not provide a pathway for otter to use for foraging between suitable habitats. It is located at the outer reaches of the survey area for otter.

Coniferous woodland towards the east of the Nether Lochaber survey area was inaccessible due to the density of the understorey and the steep topography. Areas of dense rhododendron scrub within the Ardgour survey area was also inaccessible. Where possible an assessment of these habitats and their suitability for protected species was made from access points which allowed view of the surrounding habitat types. Thus, the survey data captured was considered to be appropriate in determining the presence/likely absence of the target species.

3 Desktop Study

An overview of the relevant information identified during the desktop study of the PEA is provided in the sections below. For further information please refer to the PEA report (Affric, 2022).

3.1 Site Designations

No sites designated for the presence of badger, red squirrel, pine marten or bats are present within 20km of the survey site however, four Special Areas of Conservation (SAC) and one Site of Special Scientific Interest (SSSI) situated within 20km of the survey site have been designated partially, or in full, for otter. None of the five designated sites are considered to have ecological connectivity to the survey site (as justified within Table 3.1). Therefore, protected species as qualifying features of designated sites will not be considered within the conclusions or recommendations of this report.

Table 3.1: Sites Designated for Bats, Badger, Pine Marten, Red Squirrel and/or Otter within 20km of the Survey Site

Designated site	Qualifying feature(s)	Approximate distance from survey site	Ecological connectivity (yes/no)	Comments
Glen Creran Woods SAC	Otter	12.7km SSE	No	In a coastal environment otter generally range between 2-10km (Chanin, 2013). In order for otter from the SAC to reach the survey site, otter would need to travel approximately 15km. Hence, it is considered unlikely that otter associated with the Glen Creran SAC would be found within the survey site.
Sunart SAC and SSSI	Otter	18.1km WSW	No	In a coastal environment otter generally range between 2-10km (Chanin, 2013). In order for otter from the SAC and SSSI to reach the survey site, otter would need to travel approximately 37km. Hence, it is considered unlikely that otter associated with the Sunart SAC and SSSI would be found within the survey site.
Loch Moidart and Loch Shiel Woods SAC	Otter	18.9km NW	No	In a coastal environment otter generally range between 2-10km (Chanin, 2013). In order for otter from the SAC to reach the survey site, otter would need to travel approximately 130km. Hence, it is considered unlikely that otter associated with the Loch Moidart and Loch Shiel Woods SAC would be found within the survey site.
Loch Etive Woods SAC	Otter	19.3km SE	No	In a coastal environment otter generally range between 2-10km (Chanin, 2013). In order for otter from the SAC to reach the survey site, otter would need to travel approximately 40km. Hence, it is considered unlikely that otter associated with the Loch Etive Woods SAC would be found within the survey site.

3.2 Species Records

Records of the target species identified within and surrounding the survey site are discussed in Table 3.2.

Table 3.2: Overview of Records of the Target Species Identified Within and Surrounding the PSS Boundaries

Species	Nether Lochaber	Ardgour
Bats	There are no records of bat species within 2km of the Nether Lochaber survey area. However, records of common pipistrelle and soprano pipistrelle were identified within 5km of the Nether Lochaber survey area, thus the species are known to be present within the wider locality.	There are no records of bat species within 2km of the Ardgour survey area. However, records of common pipistrelle were identified within 5km of the Ardgour survey area, thus the species are known to be present within the wider locality.
Badger	There are no records of badger within the Nether Lochaber survey area. However, records were identified within 2km of the Nether Lochaber survey area thus the species are known to be present within the wider locality.	No records of badger were identified within 5km of the Ardgour survey area.
Pine marten	There is a record of a deceased pine marten identified immediately adjacent to the Nether Lochaber survey area on the A82. Further records were identified within the coniferous woodland, situated east of the Nether Lochaber survey area.	There are no records of pine marten within 2km of the Ardgour survey area. However, records of the species were identified within 5km, thus, the species are known to be present within the wider locality.
Red squirrel	There are records of red squirrel within close proximity to the Nether Lochaber survey area. In particular within the coniferous woodland on the eastern side of the A82.	There is a record of a red squirrel identified immediately adjacent to the Ardgour survey area, within a residential garden just of the A861. Further records were identified within 2km of the Ardgour survey area.
Otter	There are records of otter within the Nether Lochaber and Ardgour survey area. This includes records of the species within the Loch Linnhe waterbody, between the two parcels of land.	

It is worth noting that the identification of species records does not confirm that a species is still present within an area and that the lack of species records does not provide confirmation of the absence of a species, as the absence of species data can be a result of a lack of survey efforts or the non-submission of results.

4 Results

4.1 Bats

4.1.1 Roosting Bats – Trees

4.1.1.1 Nether Lochaber

Multiple PRFs suitable for individual bats were identified within the trees situated within the broadleaved woodland strip, situated in the Nether Lochaber survey area, between the A82 and Loch Linnhe. PRFs included gaps under peeling bark, woodpecker holes, small holes caused by insect infestation and rot (i.e., at branch junctions), snapped out tops and cracks in the stem structure (see Table 4.1). All of the PRFs identified were considered to be suitable for individual bats. None of the PRFs identified were considered to be suitable to support a large number of bats, for example a maternity roost. Hence, the trees were identified as having low suitability for roosting bats (see Table 4.1). However, due to the number of PRFs, it is considered that the woodland habitat in its entirety has an overall moderate to high potential for roosting bats, which should not be discounted.

4.1.1.1.1 Ardgour

One tree was identified within the wider survey area (i.e. area inspected for badger, otter and pine marten) as having moderate suitability for roosting bats, due to the presence of several PRFs associated with features of old growth (see TN31; Table 4.1). As the tree was situated >30m from any proposed works, it is not considered to be an ecological receptor of the CFIIS, however the tree was included within the results, as it provides further context of the wider locality and its suitability for bats.

4.1.1.2 Summary

The PRFs identified on trees during the survey are outlined in Table 4.1.

Table 4.1: Target Notes Recorded During the PSS on the 28th May and 16th August Regarding Roosting Bats in Trees

Target Note No.	Location		Description				Photo(s)
	Easting	Northing	Tree Tag No.	Species	Comments	Suitability	
TN10	202249	763719	99	Alder.	Two small holes on the stem due to the loss of branches and subsequent decay.	Low suitability	P1
TN11	202250	763730	98	Downy birch	Large cracks in the stem.	Low suitability	P2 – P3
TN12	202260	763741	Untagged due to access constraints.	Sycamore	Small holes in stem.	Low suitability	P4
TN13	202271	763765	52	Common ash	Small holes in stem and apparent cavity in centre of stem.	Low	P5 – P6
TN14	202286	763777	53	Silver birch	Cracks in stem. Apparent hollow in centre of stem.	Low	P7
TN15	202280	763818	97	Alder	Small gaps beneath peeling bark. Snapped out top.	Low	P8 & P9
TN17	202290	763840	66	Alder	Small hole in stem.	Low	P10
TN18	202301	763841	55	Alder	Small gaps under peeling bark. Snapped out stem.	Low	P11
TN19	202316	763846	56	Alder	Small holes on the stem due to woodpecker, insects and the loss of branches and subsequent decay.	Low	P12
TN20	202322	763850	57	Alder	Crack in stem.	Low	P13
TN21	202316	763855	58	Alder	Crack in Stem.	Low	P14
TN22	202338	763890	59	Alder	Small holes in stem caused by woodpecker and/or insects and rot. Gaps beneath peeling bark.	Low	P15
TN28	201456	763717	N/A outwith 30m buffer zone.	Beech	Large mature beech tree with many features of old growth, including fungal brackets and large cavities.	Moderate	P16 – P17

4.1.2 Roosting Bats - Built Structures

4.1.2.1 Nether Lochaber

No built structures were identified within the Nether Lochaber bat survey area that required further consideration in relation to roosting bats.

4.1.2.2 Ardgour

The CIIFS may include the refurbishment of a listed building, the Lighthouse Store (MHG17310); (Highland Historic Environment Record, 2023). The Lighthouse Store is situated NN01676355, immediately adjacent to the western banks of Loch Linnhe. The building dates back to the late 19th century and is single storey. The walls are three-bay, constructed with red-brick. The gable roof is constructed of overlapping slate tiles supported by a timber frame. There are window fixtures on all elevations of the building comprised of glass panels supported by timber frames. The external doorway is situated on the northern elevation and is comprised of wood. There is no chimney.

Internally, the building was relatively clean and tidy. The key holder confirmed that the floors and surfaces are cleaned on a semi-regular basis. There were three rooms in total, a large room which made up the majority of the building and two smaller rooms towards the eastern elevation. The rooms were filled with machinery, tools, and equipment, some of which had evidently been in place for some time. Machinery was inspected for potential bat droppings, although none were identified. Plywood has been placed over timber support beams to separate the main rooms from the roof void. The roof void could not be accessed for inspection however, where possible, a torch was used to look up into the roof space through gaps in the plyboard (predominantly around the edge of the room), to inspect for suitability of the structure for roosting bats. Additionally, the plyboard itself was inspected for evidence of urine stains.

Overall, the building was in fair condition and was being used by THC as a workshop and storeroom however, the lead flashing situated on the roof apex had risen in some places, particularly towards the eastern end of the building and several of the slate tiles have become risen providing potential access/egress points. There were also small gaps between the window and door fixtures and the brick walls. Internally, gaps in the plyboard ceiling structure provide potential access/egress between the roof void and the main structure. The PRFs were only considered to be suitable for individual roosting bats to use opportunistically. Furthermore, no evidence of roosting bats was identified internally or externally. Nonetheless, due to the number of PRFs, the building was considered to have moderate suitability for roosting bats.

4.1.2.3 Summary

The PRFs identified in built structures during the survey are outlined in Table 4.2.

Table 4.2: Target Notes Recorded During the PSS on the 28th May and 16th August Regarding Roosting Bats in Built Structures

Target Note No.	Location		Description				Photo(s)
	Easting	Northing	Tree Tag No.	Species	Comments	Suitability	
TN29	201682	763550	B1	Brick structure currently used as a workshop and storage area. Internal and external PRA undertaken.	Low	P18 – P23	TN29

4.1.3 Foraging/Commuting Bats

The Nether Lochaber bat survey area is comprised of broadleaved woodland, amenity grassland, infrastructure, and residential and commercial plots (with areas of hard and soft landscaping) (see Section 1.1). To the west is Loch Linnhe, an elongated sea loch and the east is a large area of coniferous woodland, separated from the survey area by the A82 (although the A82 is not considered to be an impenetrable barrier for foraging/commuting bats and there is therefore considered to be ecological connectivity between habitats within the survey area and those to the west). Coniferous and broadleaved woodland are considered to provide optimal habitat for foraging/commuting bats. The A82 may act as a navigational feature and open water (Loch Linnhe) and the sub-urban environment, including residential gardens, amenity grassland and streetlights may provide suitable foraging habitat for bats. The Nether Lochaber bat survey area is therefore considered to have high suitability for foraging/commuting bats overall.

The Ardgour bats survey area is comprised of amenity grassland, coastal margins, infrastructure, and residential and commercial plots (with areas of hard and soft landscaping). Nonetheless, the residential gardens are considered to provide continuous foraging/commuting habitat for bats. The large open areas of grazing pasture to the east and open water (Loch Linnhe) to the west are also considered to provide suitable foraging habitat. Thus, overall, the Ardgour bat survey area is considered to have good ecological connectivity with the wider locality. Streetlights may also provide suitable foraging habitat. The Ardgour bat survey area is therefore considered to have moderate suitability for foraging/commuting bats.

4.2 Badger

Although suitable habitat is present within the Nether Lochaber and Ardgour badger survey areas and there are records of badger within the wider locality, no evidence of badger was identified within either the Nether Lochaber or Ardgour badger survey areas.

4.3 Pine marten

No definitive evidence of pine marten was identified within either the Nether Lochaber pine marten survey area. However, five potential den sites were identified within the broadleaved woodland situated towards the north of the Nether Lochaber pine marten survey area (see Table 4.3.). The den sites were considered to be low suitability due to the lack of evidence of usage, suggesting that the potential sites may be suboptimal. A local resident confirmed that a pine marten previously denned within a residential outbuilding within their land in the Nether Lochaber pine marten survey area (see TN36; Table 4.3), thus, the species is considered likely to be present within the Nether Lochaber survey area.

No evidence of pine marten was identified within the Ardgour pine marten survey area.

Table 4.3: Target Notes Recorded During the PSS on the 28th May and 16th August Regarding Pine Marten

Target Note No.	Location		Description	Photo(s)
	Easting	Northing		
TN23	202283	763779	Small hollow beneath a rocky ledge. Dry and well sheltered by vegetation. Potential den site.	P24
TN24	202284	763780	Small hole beneath risen tree root, running into a larger hollow beneath the tree. Potential den site.	P25
TN25	202292	763773	Small hollow under rocky outcrop immediately adjacent to the A82. Noise and vibration levels are high due to traffic. However, hollow is well sheltered with vegetation and appears dry. Potential den site.	P26
TN26	202284	763783	Small hollow beneath roots of windblown tree. Ground appears slightly damp suggesting site may not be well sheltered. Potential den site.	P27
TN29	202366	763917	Large hollow beneath roots of a windblown tree. Well sheltered with moss and other vegetation. Several small holes in the vegetation running into the hollow suggest it may be (or have been) used by an animal for shelter. Potential den site.	P28
TN34	202399	764027	Area of windblown conifers providing a deadwood matrix with suitability for denning.	P29
TN35	202241	763654	Pine marten identified denning within residential outbuilding by landowner.	N/A

4.4 Red squirrel

Although suitable habitat is present within the Nether Lochaber and Ardgour red squirrel surveys areas and there are records of red squirrel within the wider locality, no evidence of red squirrel was identified within either the Nether Lochaber or Ardgour red squirrel survey areas.

4.5 Otter

Throughout both the Nether Lochaber and Ardgour survey areas, field signs were found in and around the shoreline, indicating the presence of otter either side of the Corran Narrows. A summary of these field signs noted during the survey is provided in Table 4.4. The survey area habitat provided ample opportunities within the rock and grassy slopes for places of shelter and laying-up, particularly to the northern edge of the Nether Lochaber survey area where natural rock formations meet the shoreline and there is less disturbance.

On the eastern shoreline, a potential holt (TN2) was identified in a rocky boulder formation at the rear of the unmarked road between the ferry terminal and North Corran Beag residential property. Two old spraints were located near one of the entrances (TN1), which led to a large rocky complex with numerous chambers to the rear. Although there was no evidence of current use, the side and top of the rock formation was covered in fresh grass clippings, which may have covered any recent field signs.

Further north, close to the edge of woodland adjacent to the shore was a potential lay-up and track in through grass (TN4). A spraint was located a few metres away on a prominent grassy knoll (TN3). These two target notes were located away from the residential dwellings and isolated in their locations from habitation or public access. TN5 was a potential lay-up in an area of flat grassland, adjacent to an old spraint and feeding remains on a nearby rocky ledge. A fresh spraint (TN6) was located within the same grassy area within a few metres of the potential lay-up, indicating recent use of the area by otter. At the northern extent of the 200m buffer, remains of a number of old spraints were located on a rocky outcrop (TN7) in an isolated location near to a transmission tower on the shoreline.

Within the Ardgour otter survey area, a potential lay-up (TN8) was identified north of the ferry terminal, at the base of the sea wall in front of the residential properties on the A861. This was located in a square pipe which led to a cavity or series of cavities within the sea wall foundations. The remains of several old spraints were located within the outlet. No inlet was found behind the sea wall. This potential lay-up will not be affected by the development as it is located 90m from the red line boundary as noted in the PEA report (Affric, 2022).

Behind the coastal habitat is a road, and a residential area. Behind the residences is a small lochan, Lochan na Luireach, within the outer reaches of the Ardgour survey area. As no otter tracks were found into or out of the lochan or between the lochan and coastal habitat, it was assumed that otter were not traversing between the shoreline and Lochan na Luireach.

To the south of the ferry terminal, a potential holt was identified in a circular tunnel or pipe at the base of the sea defence wall (TN9). This pipe was partially filled with sand, and fresh otter prints were noted at the entrance heading both into and out of the pipe. The pipe appeared to return inland under the sea defence and road above for a number of metres. No outlet was recorded on the road above (currently the ferry marshalling lane) or behind the sea defence.

From this point southwards, there was no evidence of otter using the beach or areas of shrubland around Corran Point, or to the south of Corran Point Lighthouse. This was not deemed premium otter habitat and was, by its nature, more exposed to disturbance from the A861 road. The beach and grassland areas appeared well used by dog walkers and grazed by sheep. These areas may be utilised on a transitory basis by otter on route to less disturbed areas to the south, away from the CFIIS.

Table 4.4: Target Notes Recorded During the PSS on the 28th May Regarding Otter

Target Note No.	Location		Description	Photo(s)
	Easting	Northing		
TN1	202185	7636285	(Nether Lochaber) Two old spraints located immediately adjacent to each other, adjacent to entrance to TN2 potential otter holt.	P30
TN2	202192	763621	(Nether Lochaber) Potential otter holt in rock/boulder formation at rear of gardens, on shoreline.	P31 – P32
TN3	202252	763753	(Nether Lochaber) New spraint.	P33
TN4	202256	763754	(Nether Lochaber) Potential lay-up and track in on edge of woodland.	P34 – P35
TN5	202316	763937	(Nether Lochaber) Potential lay-up on flat grassy area, track in, old spraint, and feeding remains in immediate vicinity.	P36
TN6	202318	763940	(Nether Lochaber) New spraint.	P37
TN7	202364	764126	(Nether Lochaber) Remains of several old spraints on rocky outcrop.	P38
TN8	201424	763910	(Ardgour) Potential lay-up in square pipe located at the base of sea defence wall, and several old spraints within pipe.	P39
TN9	201671	763645	(Ardgour) Potential otter holt in circular pipe at base of sea wall. Fresh footprints in sand at the entrance to the pipe.	P40 – P41

4.6 Other Protected Species

As noted, protected species identified outwith the list of the target species were recorded and target notes mapped.

A large area dominated by bluebell (*Hyacinthoides* spp.) was identified within the broadleaved woodland towards the north of the Nether Lochaber survey area (TN33). The patches appeared to be dominated by native bluebell (*Hyacinthoides non-scripta*). However, potential Spanish bluebell (*Hyacinthoides hispanica*) and hybrids (*Hyacinthoides* × *massartiana*) were noted.

Two potential hibernacula suitable of supporting hibernating amphibians and reptiles were also identified within the broadleaved woodland towards the north of the Nether Lochaber survey area (TN34 and TN35). One of which (TN34) appeared to be the remains of a former 'black house'.

A bird's nest was identified within a mature alder tree situated towards the coastal edge of the broadleaved woodland within the Nether Lochaber survey area (TN35). It is not known which species constructed the nest, or whether it was in use. However, it does confirm the presence of nesting birds within the habitat.

Target notes of other protected species identified during the PSS site survey are outlined in Table 4.5.

Table 4.5: Target Notes Recorded During the PSS on the 28th May and 16th August that were Unrelated to the Target Species

Target Note No.	Location		Description	Photo(s)
	Easting	Northing		
TN30	202380	763956	Large patch of bluebell that dominates the area of understorey within broadleaved woodland.	P46 – P47
TN31	202345	764007	Former 'black house' provides suitable hibernacula for amphibians and reptiles.	P48
TN32	202366	763917	Pile of stones overgrown with moss and vegetation provides a suitable hibernacula for amphibians and reptiles.	P49
TN33	202280	763818	Birds nest identified within mature alder trees.	P50

5 Discussion

5.1 Bats

PRFs were identified within several trees in the Nether Lochaber bat survey boundary and the Lighthouse Store situated within the Ardgour bat survey boundary. All of the PRFs identified were considered to be suitable for individual roosting bats, although due to the number of PRFs identified, it is possible that multiple bats could be impacted by the proposed works, should a large area of woodland be removed. Thus, far the number and location of trees to be removed is unknown, although it is anticipated that a site-targeted approach will be most appropriate for further survey works. Further surveys works will be required to determine the woodlands usage by bats (if any) (Collins, 2023).

Additionally, further survey work is required to assess the potential for roosting bats within the Lighthouse Store. It is recommended that two bat surveys are carried out to determine bat presence/likely absence. This should comprise of one dawn re-entry survey and one dusk emergence survey. The surveys should be completed between May and September (during appropriate weather conditions), a minimum of two weeks apart. Should the presence of roosting bats be confirmed during the initial surveys, additional survey works will be required to complete a roost characterisation assessment (Collins, 2023). In this instance, an EPS licence must be granted by NatureScot before any works to the building (that are likely to cause disturbance to bats) can commence.

Habitats within the Nether Lochaber survey area were considered to have high suitability for forging/commuting bats whilst habitats within the Ardgour survey area were considered to have moderate suitability for foraging/commuting bats. Due to the potential for foraging/commuting bats within both survey areas, appropriate mitigation must be implemented. It is recommended that appropriate mitigation is detailed within a Construction Environmental Management Document (CEMD) by an appropriately competent and experienced ecologist. This should include advice from BCT's 'Guidance Note 08/23 Bats and Artificial Lighting' (BCT and Institution of Lighting Professionals (ILP), 2023).

5.2 Badger

No records of badger were identified within either the Nether Lochaber or Ardgour survey area and no evidence was identified within either the Nether Lochaber or Ardgour badger survey areas. Records of badger were identified within 2km of the Nether Lochaber survey area, and, although no records of badger were identified within 5km of the Ardgour survey area, it is recognised that it is situated within the known national range of the species. Badger are highly mobile creatures, with clan territories recorded to range up to 3km^2 (Kruuk, 1989). Grassland and woodland within the Nether Lochaber and Ardgour survey areas provide suitable resources for sett building, foraging, and commuting, and therefore, the presence of badger cannot be entirely discounted. Thus, it should be recognised that there is potential for roaming badger to be present within both the Nether Lochaber and Ardgour survey areas and pre-construction surveys will be required to ensure that no badger setts have been built in the interim between the completed site surveys and the commencement of works.

5.3 Pine marten

There are records of pine marten within 2km of the Nether Lochaber survey area. In particular, there is a record of the species immediately adjacent to the Nether Lochaber survey area on the A82. Unfortunately, the record was identified due to a pine marten fatality. This record does however give indication that pine marten do attempt to the cross the road, which suggests that there is ecological connectivity between the woodland on either side of the road and records of the species towards the east. Suitable den sites were identified within the broadleaved woodland in the Nether Lochaber survey area. Furthermore, the owner of a residential property within the Nether Lochaber survey area confirmed that a pine marten had previously denned within an outbuilding situated within the residential plot. No definitive evidence of the species was found however, evidence of an animal was observed. For example, damage to bedding material, which could be indicative of pine marten. With consideration of species records, habitat availability and ecological connectivity within the wider locality, the presence of roaming pine marten should be considered likely within the Nether Lochaber survey area. Additional surveys such as focused camera trapping will be required to ascertain whether the potential dens are in use and to what extent, to determine whether there is a potential for adverse effects due to the CFIIS.

There are no records of pine marten within 2km of the Ardgour survey area however, records of the species were identified within the wider locality (5km). Habitats within the survey area were considered to be sub-optimal for pine marten due to the lack of suitable denning habitat although it may provide suitable connective habitat for roaming pine marten. Hence, the presence of the species should not be discounted entirely and the potential for roaming pine marten should be considered.

5.4 Red squirrel

There are several records of red squirrel within <500m of the Nether Lochaber survey area. In particular, there is a record of a red squirrel crossing the A82 and several records of the species within the coniferous woodland towards the east. These records suggest that there is ecological connectivity between the woodland on either side of the highway. There is also a record of red squirrel immediately adjacent to the Ardgour survey area, within a residential garden. No evidence of red squirrel was identified in either the Nether Lochaber or Ardgour red squirrel survey areas during the site survey however, woodland habitats within the Nether Lochaber survey area and small patches of trees within and adjacent to interlinking residential gardens within the Ardgour survey area are considered to provide suitable habitat for red squirrel. Thus, with consideration of species records, habitat availability and ecological connectivity within the wider locality, the presence of roaming red squirrel should be considered likely within both the Nether Lochaber and Ardgour survey areas and pre-construction surveys will be required to ensure that no red squirrel dreys have been built in the interim between the completed site surveys and the commencement of works.

5.5 Otter

Records of otter identified during the desktop study and evidence of otter identified during the site survey suggests current, frequent use of the Nether Lochaber and Ardgour survey areas by otter. Additional surveys such as focused camera trapping will be required to ascertain whether the potential resting places are in use and to what extent, to determine whether there is a potential for adverse effects due to the CFIIS.

5.6 Native Bluebell

Native bluebell are present within the broadleaved woodland situated towards the north of the Nether Lochaber survey area. As both native and non-native bluebell were identified, consideration to the protection of native bluebell and the prevention of spread of INNS should be considered.

5.7 Other Protected Species

Potential for herptiles and breeding birds was identified during the PSS. Appropriate mitigation to minimise adverse impacts to herptile and ornithological species, in particular hibernating herptiles and breeding birds, should be considered. It is recommended that any potential hibernacula be removed by hand outwith the herptile hibernation season (generally October to March inclusive), to prevent disturbance to hibernating herptiles. If works are scheduled to start during the breeding bird season (generally March to September inclusive), a breeding bird survey must be completed prior to the commencement of works. Additionally breeding bird surveys should be completed prior to the commencement of works in any new areas. If any breeding birds are identified during the breeding bird surveys, or during the works, then appropriate mitigation, such as the installation of suitable exclusion zones, should be implemented.

6 Conclusion

An overview of the findings of the report has been provided in order to identify the requirements for further surveys works (see Table 6.1).

Table 6.1: Overview of Findings of the Protected Species Survey and Recommendations

Receptor	Presence / likely absence	Comments	Recommendations
Roosting bats	To be determined	Potential for roosting bats within the Lighthouse Store in Ardgour and trees within the broadleaved woodland in Nether Lochaber.	Further survey works will be required to determine the woodlands usage by bats (Nether Lochaber). Requirements for survey works should be determined by a suitably experienced and competent bat ecologist once the location of tree works has been outlined. It is likely that a period of monitoring will be required with the use of static detectors, although other survey methods may be necessary/more appropriate. If any works to the Lighthouse Store are to be undertaken, an ecologist will be required to determine whether the works have the potential to impact upon roosting bats. If the potential for impact is confirmed, bat activity surveys should be carried out to determine the presence/likely absence of roosting bats. It is recommended that two bat activity surveys are undertaken initially (i.e., one dawn re-entry survey and one dusk emergence survey). If the presence of roosting bats is confirmed during the initial survey, further survey work must be carried out to undertake a roost characterisation assessment.
Foraging / commuting bats	Moderate to high potential	High suitability in the Nether Lochaber survey area. Moderate suitability in the Ardgour survey area.	As above.
Badger	Potential for roaming badger	Potential for roaming badger within Nether Lochaber and Ardgour survey areas	Mitigation for roaming badger within Nether Lochaber and Ardgour should be considered. Pre-construction surveys for badger within both Nether Lochaber and Ardgour should be carried out by a suitably competent and experienced ecologist. Surveys should include all suitable habitats within construction areas and a 100m buffer.

Receptor	Presence / likely absence	Comments	Recommendations
Pine marten	Present	Five suitable den sites for pine marten were identified within the Nether Lochaber survey area. Potential for roaming pine marten within Nether Lochaber and Ardgour survey areas.	Mitigation for roaming pine marten should be considered within Nether Lochaber and Ardgour. A 2-3 week (minimum) period of camera trapping should be carried out at potential pine marten dens (TN23, TN24, TN25, TN26, TN29 and TN30) to determine presence/likely absence of denning pine marten in Nether Lochaber.
Red squirrel	Potential for roaming red squirrel	Potential for roaming red squirrel within Nether Lochaber and Ardgour.	Mitigation for roaming red squirrel should be considered within Nether Lochaber and Ardgour. Pre-construction surveys for red squirrel within both Nether Lochaber and Ardgour should be carried out by a suitably competent and experienced ecologist. Surveys should include all suitable habitats within construction areas and a 50m buffer.
Otter	Present	Potential otter holts and layups were identified within the Nether Lochaber and Ardgour otter survey area.	Mitigation for roaming otter should be considered within Nether Lochaber and Ardgour survey area. A 2-3 week (minimum) period of camera trapping should be carried out at potential otter holts [Redacted] to determine presence/absence and activity levels.
Native bluebell	Present	Patches of native bluebell are present within the woodland situated in Nether Lochaber.	If the works are to be undertaken in areas containing native or INNS bluebell species, appropriate mitigation to protect native bluebell should be incorporated into the CEMD, including, where necessary, the installation of exclusion zones, or appropriate translocation.
Herptiles	Potential for common and widespread herptile species.	Two potential hibernacula were identified within the woodland situated in Nether Lochaber.	Potential hibernacula should be removed by hand under the supervision of an ecologist, outside of the herptile hibernation season (October to March inclusive).

Receptor	Presence / likely absence	Comments	Recommendations
Breeding birds	Potential for breeding birds.	There is considered to be suitable nesting habitat for breeding birds throughout the Nether Lochaber and Ardgour survey areas.	Vegetation removal (including tree removals) should be undertaken outside of the breeding bird season (March to September inclusive), or once an ecologist has inspected the area and confirmed that there are no active nests. A Pre-construction Breeding Bird Survey must be undertaken by an ecologist if works are scheduled to start within the breeding bird season.

The results of this report will be used to inform an Environmental Impact Assessment (EIA) and further surveys have been recommended as detailed in Table 6.1. If protected species are identified within the survey boundaries during subsequent surveys, mitigation will be identified in order to negate or minimise any potential impacts. A protected species licence will be required prior to construction. An application for a protected species licence from NatureScot will include a Species Protection Plan (SPP) detailing all mitigation measures previously identified.

This report details a snapshot of conditions on 24th May 2023 and the 16th August 2023. Should the interim extend beyond 12 months, it would be advisable to update the PSS to ensure that the information available is accurate and up to date, as per the recommendation of CIEEM (CIEEM, 2019).

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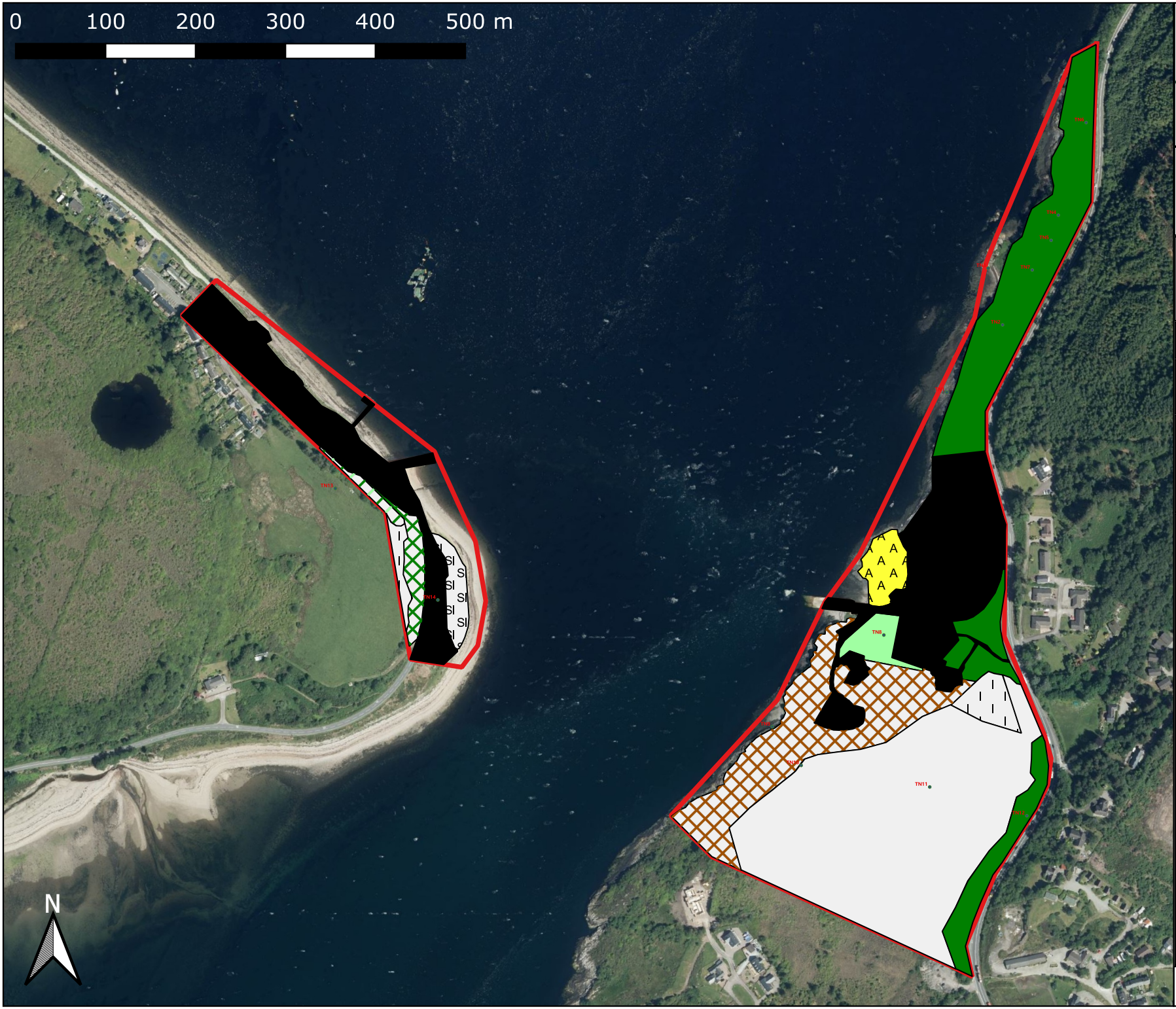
8 Glossary

Acronym	Definition
BCT	Bat Conservation Trust
CFIIS	Corran Ferry Infrastructure Improvement Scheme
CIEEM	Chartered Institute of Ecology and Environmental Management
D	Disused
E	East
EIA	Environmental Impact Assessment
EPS	European Protected Species
HNBAP	Highland Nature Biodiversity Action Plan
ILP	Institution of Lighting Professionals
INNS	Invasive Non-native Species
N	North
NBN	National Biodiversity Network
PEA	Preliminary Ecological Appraisal
PRA	Preliminary Roost Assessment
PSS	Protected Species Survey
PRF	Potential Roosting Feature
PU	Partially used
S	South
SAC	Special Area of Conservation
SPP	Species Protection Plan
THC	The Highland Council
TN	Target Note
W	West
WCA	Wildlife and Countryside Act 1981 (as amended)
WU	Well used

9 Drawings



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99_DRG_03_1: Site Habitat Map

Projection: OSGB 1936/British National Grid EPSG: 27700

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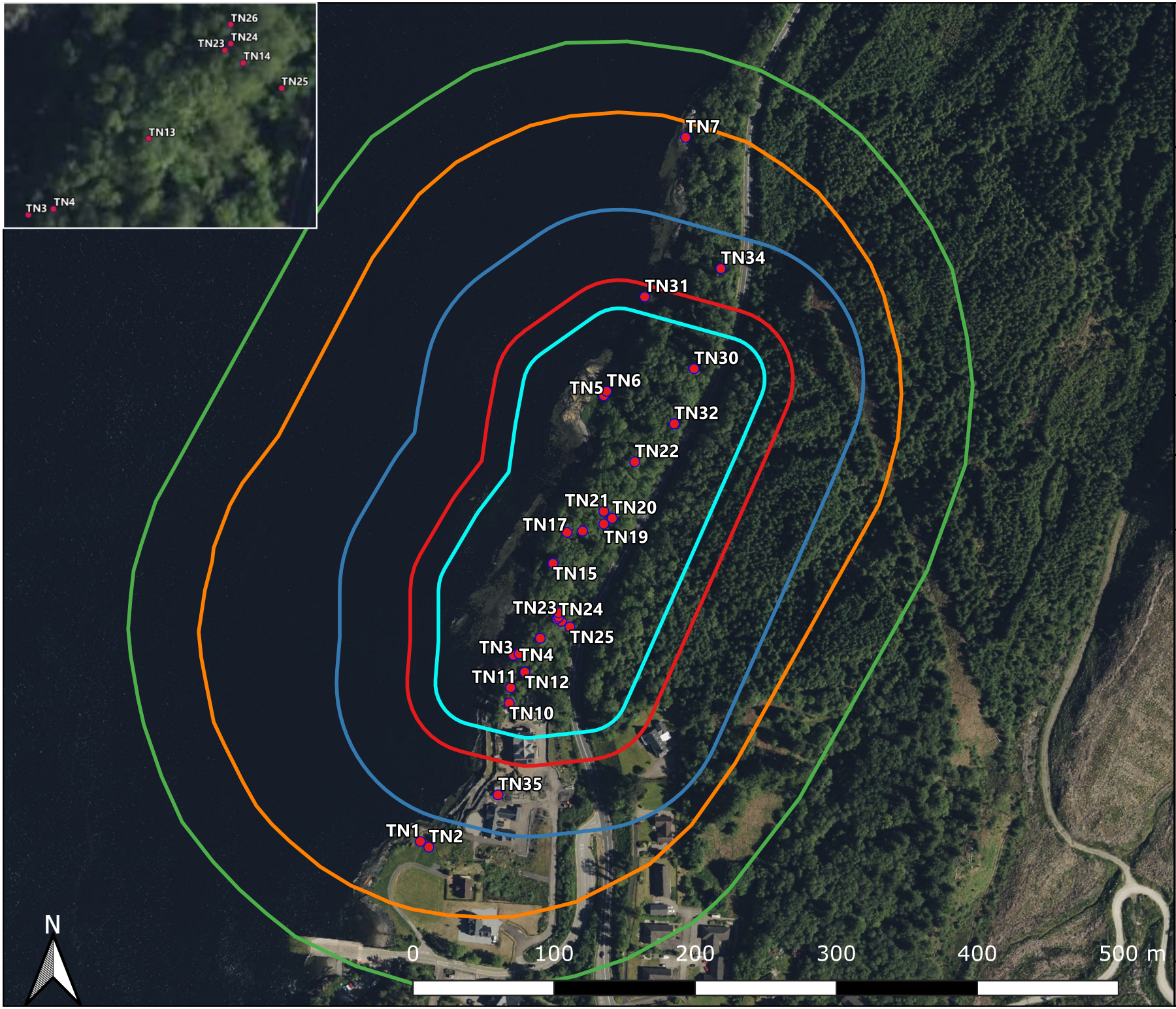
Your use of OS OpenData is subject to the terms at http://os.uk/opendata/licence. Contains Ordnance Survey data© Crown copyright and database right 2022.

Legend

Habitats

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.2.1 - Coniferous woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- B4 - Improved grassland
- B6 - Poor semi - improved grassland
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.4 - Introduced shrub
- J3.6 - Buildings
- J5 - Other habitat
- Target Notes PEA
- Survey Area



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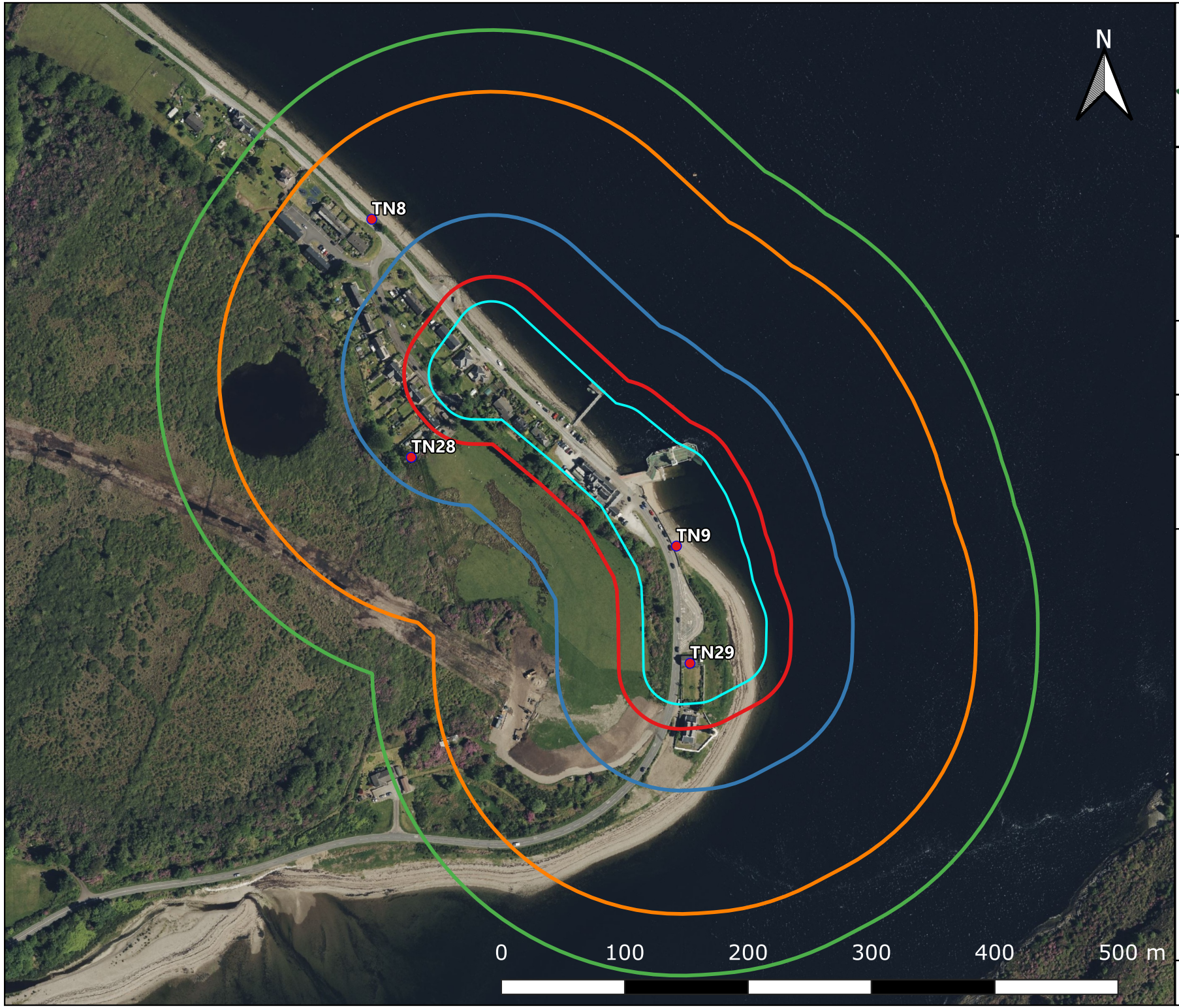
Title: 99_DRG_11_1 Nether Lochaber Indicative Species Specific Survey Areas

Projection: OSGB 1936/British National Grid EPSG: 27700

Google (2023) Corran Narrows. Available at: http://maps.google.co.uk (Accessed: 20 August 2023).

Legend

- Protected Species Target Notes
- 30m Bat Survey Area
- 50m Red Squirrel Survey Area
- 100m Badger Survey Area
- 200m Otter Survey Area
- 250m Pine Martin Survey Area



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Title: 99_DRG_12_1 Ardgour Indicative Species Specific Survey Areas

Projection: OSGB 1936/British National Grid EPSG: 27700

Google (2023) Corran Narrows. Available at: http://maps.google.co.uk (Accessed: 20 August 2023).

Legend

- Protected Species Target Notes
- 30m Bat Survey Area
- 50m Red Squirrel Survey Area
- 100m Badger Survey Area
- 200m Otter Survey Area
- 250m Pine Martin Survey Area

Appendix 5. Benthic Ecology Survey Report

OCEAN ECOLOGY

Marine Surveys, Analysis & Consultancy

Corran Ferry Ground Investigation Surveys: Technical Report

REF: OEL_ CAUCOR0623_TCR_V01

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Version

Version	Date	Description	Author(s)	Reviewed By	Approved By
V01	20/03/2024	Draft issued to client	Dr. Ana Corrochano- Fraile, Madison Riley-Powell	Dr Elena Cappelli	Gary Robinson

Updates

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Abbreviations

AFDW	Ash Free Dry Weight
AL	Action Level
BIIGLE	Bio-Image Indexing and Graphical Labelling Environment
BSH	Broad-Scale Habitat
CATAMI	Collaborative and Annotation Tools for Analysis of Marine Imagery
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CLOC	Clear Liquid Optical Chamber
DDC	Drop-down Camera
EC	European Commission
EMODNet	European Marine Observation and Data Network
EU	European Union
EUNIS	European University Information Systems
FOCI	Features of Conservation Importance
GPS	Global Positioning System
HA	Habitats Assessment
HD	High Definition
HOCI	Habitat of Conservation Importance
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
LED	Light-emitting diode
MP	Megapixels
MSFD	Marine Strategy Framework Directive
NMBAQC	NE Atlantic Marine Biological Analytical Quality Control
nMDS	Non-Metric Multi-Dimensional Scaling
OEL	Ocean Ecology Ltd.
OSPAR	Oslo Paris
PSD	Particle Size Distribution
QAF	Quality Assurance Framework
QC	Quality Control
RSMP	Regional Seabed Monitoring Plan
SAC	Special Area of Conservation
SE	Standard Error
SIMPER	Similarity Percentages
SIMPROF	Similarity Profile
UK	United Kingdom
UPS	Uninterruptable Power Supply
USBL	Ultra-short Baseline
UTM	Universal Transverse Mercator
WoRMS	World Register of Marine Species

Non-Technical Summary

Introduction

Causeway Geotech have been commissioned by Affric Ltd. to undertake Ground Investigation surveys to inform the detailed design of new ferry infrastructure to support the introduction of electric vessels on the Corran Ferry route. The Corran Ferry, operated by The Highland Council, crosses Loch Linnhe from the Eastern side of Nether Lochaber to the Western side of Ardgour. The ferry operates a regular service 7-days a week, providing a vital ferry connection, linking the communities of Fort William, Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Morvern and the Isles of Mull.

Survey Strategy

A sampling plan was developed prior to the survey being undertaken which included 9 Drop-Down Camera (DDC) transects within the survey area. The sampling plan was further modified while on survey to include four additional DDC transects (K1 – K4) to confirm the presence of kelp beds which were observed while in the field, and seven grab samples for macrobenthic and sediment analysis which were located along the DDC transects following initial interpretation of substrate type. The pre-planned Transect T09 was inaccessible due to its location on a drying area and Transect T10 was added and sampled as a replacement. Due to shallow waters close to shore which prevented safe access to these areas, Transects T06 and T07 were extended on the deeper end to maintain the proposed length of the original transect.

Seabed Imagery Analysis

Diverse habitats encompassing Broad Scale Habitat (BSHs) A3.1, A3.2, A3.3, A4.1, A4.2, A5.1, A5.4, and A5.5 were identified across the survey area. Notably, A5.5 'Subtidal Macrophyte Dominated Sediment' was the most dominant BSH with the biotope, A5.521 '*Laminaria saccharina* and red seaweeds on infralittoral sediments' being the most frequently encountered. This biotope corresponds to the Priority Marine Feature (PMF) habitat 'Kelp and Seaweed Communities on Sublittoral Sediment,' recognized for its conservation significance in Scottish waters. Three additional habitats representative of PMFs were observed in the survey area, specifically 'Kelp beds,' 'Low or Variable Salinity Habitats,' and 'Tide-Swept Algal Communities'.

For the PMF 'Kelp beds', the corresponding EUNIS biotopes were A3.115 *'Laminaria hyperborea* with dense foliose red seaweeds on exposed infralittoral rock', A3.2121 '*Laminaria hyperborea forest, foliose red seaweeds and a diverse fauna on tide-swept upper infralittoral rock'*, A3.214 *' Laminaria hyperborea* and foliose red seaweeds on moderately exposed infralittoral rock', and A3.2143 'Grazed *Laminaria hyperborea* forest with corraline crusts on upper infralittoral rock'.

For the PMF 'Low or Variable Salinity Habitats', the corresponding EUNIS habitat was A3.322 '*Laminaria saccharina* and *Psammechinus miliaris* on variable salinity grazed infralittoral rock'; while for the PMF habitat 'Tidal-swept Algal Communities' representative habitats were A3.222 'Mixed kelp and red seaweeds on infralittoral boulders, cobbles and gravel in tidal rapids' and A3.126 '*Halidrys siliquosa* and mixed kelps on tide-swept infralittoral rock with coarse sediment'.

All imagery underwent an Annex I Reef assessment which identified various reef types including Low Stony, Low Stony and Bedrock, Bedrock, and Bedrock and Low Stony reefs. The DDC transects covering these rocky reefs primarily included T04, T05, T06, T07, T08, and T10, and Kelp transects K3 and K4.

Sediment PSD

Among the 7 sediment samples, BSHs A5.1 'Coarse sediment' and A5.4 'Mixed Sediment' were predominant at stations ST04, ST02, ST08, and ST01, ST03, ST05, ST07, respectively. Sand emerged as the most abundant grain size fraction, followed by gravel. These findings align with the area's topography, especially given their proximity to the coast.

Macrobenthos

Within the 7 macrobenthic samples collected across the project area, a total of 3,780 individuals and 185 taxa were recorded. Nematoda (roundworms) were the most abundant taxa. The annelid *Pholoe inornata* exhibited the greatest occurrence across the survey area. One macrobenthic group including stations ST01, ST03, and ST05 was identified across the survey area and it was dominated by taxa with a preference for mixed sediments. Key species such as *Amphipholis. squamata* suggested that the biotope best matching the fauna in this group was A5.433 '*Venerupis senegalensis*, *Amphipholis squamata*, and *Apseudes latreilli* in infralittoral mixed sediment'. These results go hand in hand with the sediment and the imagery analysis, where gravel and sand were equally contributing to sediment composition. None of the other stations grouped together based on their macrobenthic assemblage. However, seabed imagery collected in closed proximity of grab samples ST02, ST04, ST07 and ST08 provided evidence of the PMF habitat 'Kelp and Seaweed Communities on Sublittoral Sediment' being present. Despite some of the macrobenthic community recorded at stations ST02, ST04, ST07 and ST08 aligned with that typically found associated with kelp and seaweed communities including ascidians, gastropods and amphipods, the habitat assignment of these stations was left at EUNIS Level 4 rather than 5 due to the lack of consistent data identifying a specific biotope.

1. Introduction

1.1. Project Overview

Causeway Geotech have been commissioned by Affric Ltd to undertake Ground Investigation surveys to inform the detailed design of new ferry infrastructure to support introduction of electric vessels on the Corran Ferry route.

The ferry service shall continue to operate throughout the period of the Ground Investigation works without disruption, except during periods when adverse weather and any other operational factors prevent the service from operating on the published timetable.

1.2. Site information

The Corran Ferry, operated by The Highland Council, crosses Loch Linnhe from the Eastern side of Nether Lochaber to the Western side of Ardgour. The ferry operates a regular service 7-days a week, providing a vital ferry connection, linking the communities of Fort William, Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Morvern and the Isles of Mull (Figure 1).

1.3. Aims and Objectives

OEL were commissioned by Causeway Geotech to undertake a Drop-Down Camera (DDC) transect survey, grab sampling and subsequent analysis and reporting, required to provide marine habitat and species data to inform the Environmental Impact Assessment (EIA) Report.

The DDC transect survey and environmental grab sampling was undertaken at 9 locations across the survey area. Additional DDC transects were surveyed to confirm the presence of kelp bed areas and their approximate extent.

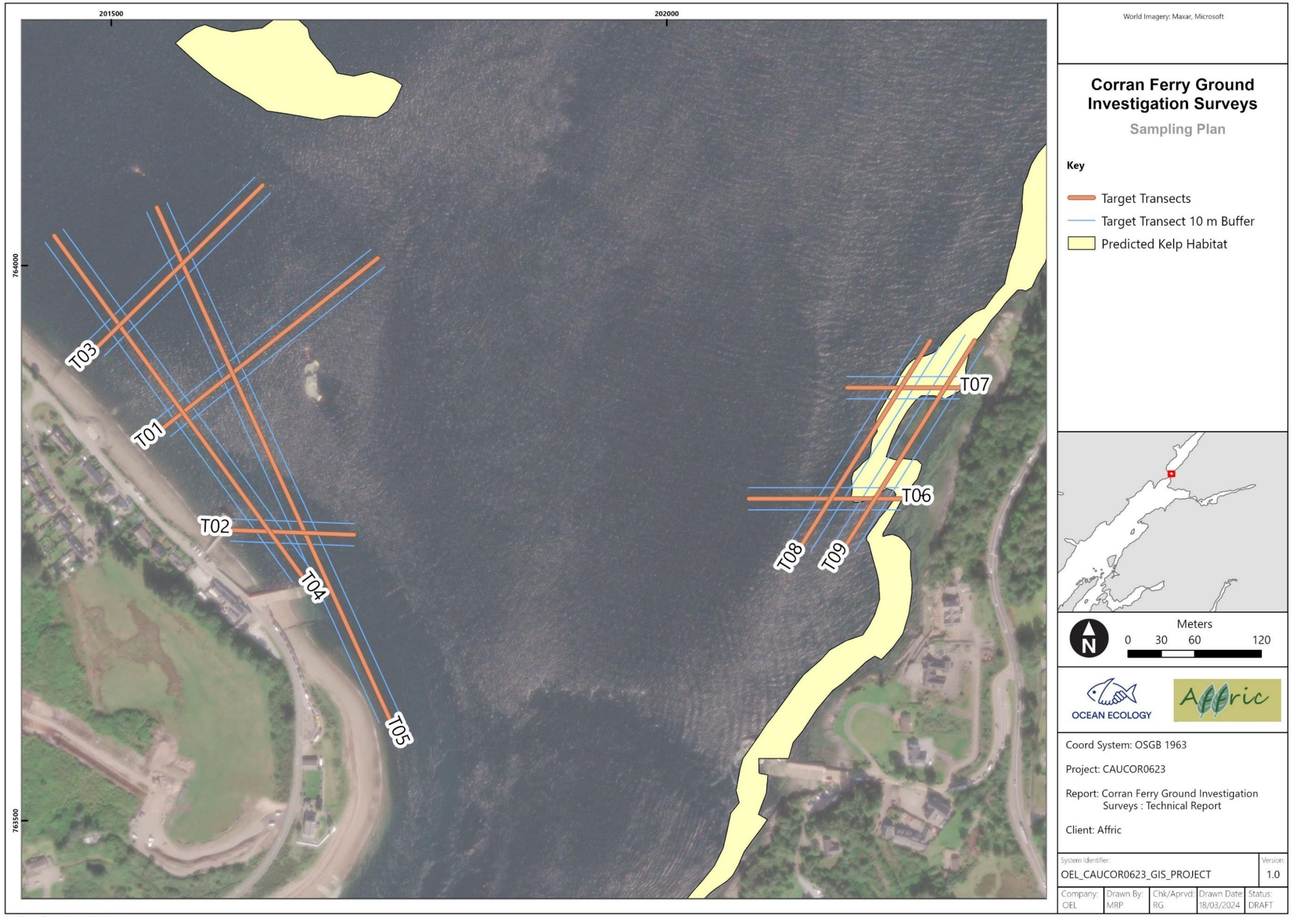

Figure 1 Overview of The Corran Ferry survey area, including the target transects and the target transect buffers (10 m either side).

2. Current Understanding

2.1. Priority Marine Features

Priority Marine Features (PMFs) are habitats and species that are considered to be marine nature conservation priorities in Scottish waters (Tyler-Walters et al. 2016). The following PMF habitats have been recorded within or near to the project site.

Kelp Beds

The kelp *Laminaria hyperborea* is commonly found around the coast of Scotland and its islands in shallow waters (to a maximum of 20-30m) and it can form forests and parks in rocky coastal areas, under a variety of wave and tidal conditions. The kelp provides a canopy under which a wide range of animals and other seaweeds can thrive. The rocks below the kelp are often encrusted with coralline algae or support cushion forming fauna, such as sea anemones, sponges and sea squirts. Small crustaceans and worms live among the kelp, while sea urchins and sea snails graze on the seaweeds, and fish find shelter from predators among the fronds. Scotland holds a significant proportion of the UK records of kelp beds and therefore the habitat is considered to be nationally important. Threats to this habitat include activities that alter wave exposure or tidal flow. Observations of this habitat within the survey area have been reported as European Nature Information System (EUNIS) biotope A3.2131 '*Laminaria hyperborea* forest and foliose red seaweeds on tide-swept upper infralittoral mixed substrata' and EUNIS classification A5.52 **'**Kelp and seaweed communities on sublittoral sediment' (Figure 2).

Kelp and Seaweed Communities on Sublittoral Sediment

Kelp and seaweed communities on sublittoral sediment represent shallow underwater environments characterized by a variety of seaweeds, including the sugar kelp *Saccharina latissima*, the bootlace weed Chorda filum, and various red and brown filamentous seaweeds. In areas with reduced wave action, algae such as *Phyllophora crispa* may form loose-lying mats on the sediment surface. These habitats foster a diverse array of associated marine life, including burrowing polychaete worms, bivalves, scavenging hermit crabs, regular crabs, starfish, fish, and grazing top shells. These communities are exclusive to shallow waters, reaching a maximum depth of 20 metres, and can be found on diverse substrates ranging from muddy sands and gravels to cobbles and boulders. They adapt to various environmental conditions. In Scotland, these kelp and seaweed-dominated habitats are notably widespread along the west coast and in sheltered areas of Orkney and Shetland, with occasional records on the east coast. While predominantly recorded in Scotland, this habitat is also found around the British Isles, particularly in the south and west. This diverse underwater habitat, however, is sensitive to factors such as substratum loss, alterations in water flow or wave exposure, and deoxygenation. Pressures on this environment include the impacts of climate change, coastal development, and the effects of bottom trawling.

Preserving these habitats is crucial for maintaining their biodiversity and resilience in the face of various challenges.

Low or Variable Salinity Habitats

Low or variable salinity habitats manifest where sea water and fresh water converge in varying proportions, influenced by tidal fluctuations and inputs from rivers, rainfall, and runoff. Along coastal saline lagoons, for instance, salinity levels may shift with the tide, resulting in brackish, fully saline, or occasionally hypersaline conditions. These habitats, characterized by less diversity compared to fully marine or freshwater environments, are often dominated by resilient or specialized species. Specialized inhabitants, including certain sea anemones, snails, bivalves, and stoneworts, may be particularly rare and restricted to saline lagoons or habitats with variable salinity. Typically found in estuaries, these environments can also occur at the heads of sea lochs and inlets influenced by freshwater runoff or within saline lagoons. In Scotland, low or variable salinity habitats are widespread on the west coast, the Outer Hebrides, Orkney, and Shetland, with fewer occurrences documented on the east coast. These habitats are distributed throughout the UK, especially in estuaries and coastal waters affected by freshwater runoff and are particularly concentrated in areas with low-lying land near estuaries, notably in parts of England. Scotland's diverse coastline plays a significant role in supporting a substantial portion of these habitats within the broader UK context. However, they face threats from activities altering water flow and salinity regimes, such as coastal development, land reclamation, and water abstraction. Additionally, these habitats are vulnerable to sea-level rise and pollution. Saline lagoons, in particular, are fragile and rare, susceptible to extreme weather events like storms, which can obliterate small lagoons formed by sediment barriers. Preservation efforts are crucial to safeguard the integrity of these unique and sensitive ecosystems.

Tide-Swept Algal Communities

Tide-swept algal communities thrive on bedrock and mixed substrata, shaped by robust tidal currents and dominated by expansive seaweeds like fucoids and kelps. These seaweeds form either dense forests or scattered parks, creating a canopy that offers shelter to an understorey of diverse flora and fauna, including foliose red seaweeds, sea squirts, sea mats, and sea firs. Some species even grow directly on the seaweeds. The bedrock or boulders below provide essential habitats for various marine life, such as limpets, winkles, dog whelks, tube worms, sponges, crabs, and starfish. This habitat thrives in sheltered to wave-exposed tidal channels, often positioned at the entrance of or near sea lochs, between coastal islands, or between islands and the mainland where tidal flow is channelled by the coastline's contours. Ranging from the mid shore down to depths of 30 meters, these communities can adapt to both full and variable salinity conditions. In Scotland, tide-swept algal communities have been recorded in various locations, including the west coast (e.g., the Strait of Corryvreckan and the Falls of Lora), the Outer Hebrides (e.g., the Sound of Harris), Orkney (e.g., Eynhallow Sound), and Shetland (e.g., the Narrows). This habitat is

widely distributed around the UK and Ireland, with a notable concentration on the west coast. However, these communities face potential threats. The harvesting of kelp and wrack components may impact habitat structure and species diversity. Additionally, any activities that reduce water flow, such as coastal development or the installation of renewable energy devices, can have adverse effects on these dynamic and vital marine habitats. Preserving the natural conditions and water flow is crucial for the sustained health of tide-swept algal communities.

2.2. Potential Annex I Habitats within the Survey Area

Reefs

For the purposes of the European Commission (EC) Habitats Directive, the Interpretation Manual of European Union Habitats – EUR25 (CEC, 2013) defines Annex I 'Reefs' as: *'Reef can be either biogenic concretions*[1] *or of geogenic origin*[2]*. They are hard compact substrata* [3]*on solid and soft bottoms, which arise from the sea floor* [4]*in the sublittoral and littoral zone*[5]*. Reefs may support a zonation of benthic communities of algae and animal species as well as concretions and corallogenic concretions.*

Following this definition, Annex I reef habitats protected under the Habitats Directive can be classified into the following subtypes discussed in detail below:

- Bedrock - encompassing "hard compact substrata", specifically, "rocks (including soft rock, e.g. chalk)" of "geogenic origin";
- Stony - encompassing "hard compact substrata", specifically, "boulders and cobbles (generally >64 mm in diameter" of "geogenic origin";
- Biogenic (encompassing "biogenic concretions").

The following reef habitats have been recorded within or near to the survey area.

Bedrock Reef

Annex I bedrock reef habitat occurs where soft (e.g., clay) or hard bedrock arises from the surrounding seabed, providing a stable habitat for attachment for a diverse range of epibiota. Bedrock reefs and associated biological communities can be highly variable due to the diverse

[1] concretions, encrustations, corallogenic concretions and bivalve mussel beds originating from dead or living animals, i.e. biogenic hard bottoms which supply habitats for epibiotic species.
[2] reefs formed by non-biogenic substrata.
[3] rocks (including soft rock, e.g. chalk), boulders and cobbles (generally >64 mm in diameter). Such hard substrata that are covered by a thin and mobile veneer of sediment are classed as reefs if the associated biota are dependent on the hard substratum rather than the overlying sediment.
[4] the reef is topographically distinct from the surrounding seafloor.
[5] the reefs may extend from the sublittoral uninterrupted into the intertidal (littoral) zone or may only occur in the sublittoral zone, including deep water areas such as the bathyal. Where an uninterrupted zonation of sublittoral and littoral communities exist, the integrity of the ecological unit should be respected in the selection of sites.

nature of these habitats in terms of topography, structural complexity and exposure to tidal streams. In the photic zone communities associated with bedrock reefs are often dominated by attached algae, and often support various invertebrate species such as corals, sponges and sea squirts.

These epibiotic communities further increase structural complexity and represent key prey items that in turn attract more mobile and commercially valuable species such as fish and crustaceans.

Stony Reef

Stony reef habitats occur when stable hard substrata, namely cobbles and boulders > 64 mm in diameter arise from the surrounding habitat, creating a habitat colonised by a variety of species (Golding et al., 2020b; Irving, 2009a). Numerous Special Area of Conservation (SAC) sites have been designated in European waters to protect stony reef habitats and associated communities. Reefs are in many cases hot spots for the biodiversity supporting assemblages of various coral, sponges, ascidians, fish and crustaceans. These associated communities vary dramatically according to environmental variables and may incorporate species that occupy a range of trophic levels. The complexity of habitat created by stony reefs often supports a higher abundance of mobile fauna such as echinoderms and various crabs, hermit crabs, and squat lobsters, as well as fish species for which these species represent key prey items.

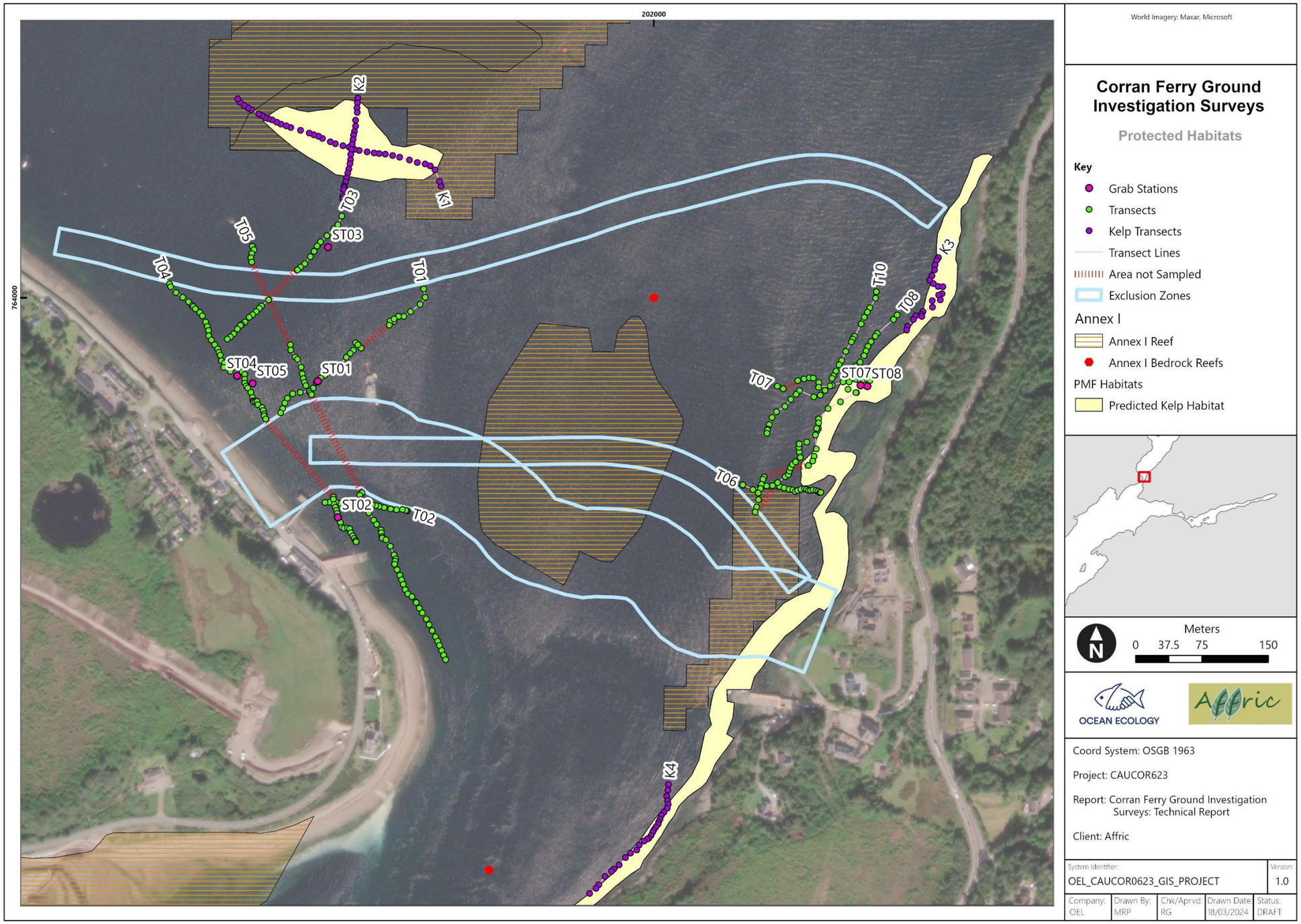

Figure 2 PMF, Annex I habitats occurring within and in the vicinity of the survey area and updated survey design including Kelp transects and grab sampling stations.

3. Survey Design

The sampling strategy was designed to provide a detailed account of the seabed to design a new ferry infrastructure for electric vessels on the Corran Ferry route. The sampling plan included DDC transects and grab samples, with four transects specifically aimed at targeting kelp beds (Figure 2). Nine transects were proposed prior to the survey taking place, while transects to target kelp beds and grab samples were planned while on survey in liaison with the Affric representative.

Below is a summary of the overall survey scope:

- Eight (T01 to T08) of the 9 proposed transects were sampled as planned; however,
- Due to shallow waters close to shore, Transects T06 and T07 were extended on the deeper end to achieve the proposed length of the target transect.
- T09 was inaccessible as it was positioned on an intertidal area and T10 was undertaken as a replacement transect.
- Seven stations were added for grab sampling as advised from the client representative on board.
- Potential kelp beds were identified in the field and K1-K4 transects were added to determine the extent of kelp beds in the area.

3.1. Timings

The vessel was mobilised on the 19th November 2023 and the survey completed between 19th and 21st of November 2023. The vessel operated out of Corran and was demobilised on 22nd of November 2023.

4. Survey Methods

4.1. Survey Navigation

The vessel was equipped with a Hemisphere V200s GPS Compass system that provided an offset position of the sampling equipment when deployed from the stern A frame. This provided a GPS feed to a dedicated survey navigation PC operating EIVA NaviPac. An offset was used to estimate subsea position of the equipment from the point of deployment on the vessel.

4.2. Project Parameters

Table 1 Datum parameters

Parameter	Details
Name	OSGB 1936
Ellipsoid	Airy 1830
Semi-Major Axis (a)	6377563.396
Semi-Minor Axis (b)	6356256.909237285
Inverse Flattening	299.3249646
Geodetic parameters EPSG Code	7022 4277

Table 2 Projection Parameters**.**

Parameter	Universal Transverse Mercator (UTM)
Central Meridian	-2.0
Latitude of Origin	49.0 °
False Easting	400000.0 m
False Northing	-100000.0 m
Scale Factor at Central Meridian	0.9996012717
Projected coordinate system EPSG code	British National Grid OSGB 1963
Units	Meters

4.3. Drop Down Camera (DDC)

Seabed imagery was collected using OEL's DDC system (Plate 1) to collect high definition (HD) video and high-resolution (up to 24 megapixels (MP)) still images at each targeted station. The camera system consisted of a SubC Rayfin camera was mounted in a Clear Liquid Optical Chamber (CLOC) (otherwise known as a 'freshwater lens') filled with fresh water to ensure imagery of suitable quality was obtained (Jones et al., 2020). Two RovTech light emitting diode (LED) strip lights with two 5 kW green dot lasers (set to 10 cm distance for scale), a 300 m umbilical and topside computer. The camera was powered with the use of an Uninterruptable Power Supply (UPS) to ensure no damage was caused should the vessel lose power or cause a power surge. The CLOC was height and angle adjustable providing a variety of options for view, lighting, and focal length to maximise data quality with respect to prevailing conditions at each station (e.g., high turbidity). Following an *in situ* review of seabed imagery, adjustments to the lighting angle were made to improve illumination across the centre of the field of view.

4.3.1. DDC Sampling

The DDC was deployed from the vessel's crane with a data umbilical run through a secondary block mounted from the crane boom. The DDC was lowered to the seabed over the target transect start location and slowly 'flown' just above the seabed to obtain continuous video footage where water clarity was sufficient. Still images representative of each target location were captured by landing the frame on the seabed. The camera was kept as close to the seabed as possible to gain a clear image where possible, while also being high enough in the water column that accidental collisions with the seabed did not occur.

All seabed imagery was collected in consideration of the JNCC epibiota remote monitoring operational guidelines (Hitchin et al., 2015). Video was captured throughout the duration of the transect and high resolution still images were captured at regular intervals (5-10m) with all video footage was reviewed *in situ* by OEL's environmental scientists and the Affric representative.

Full DDC survey logs are presented in Appendices I and II.

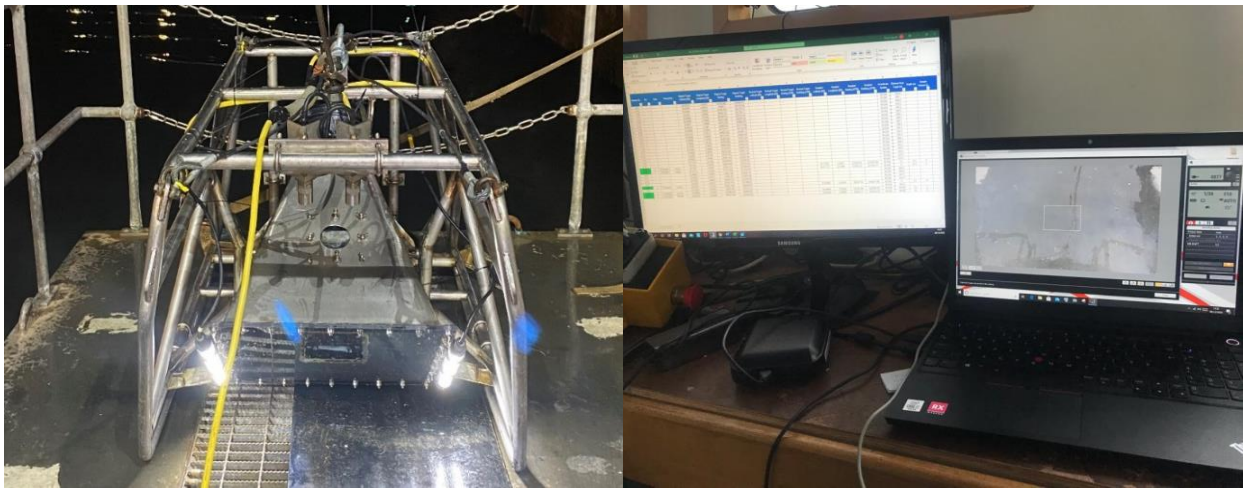

Plate 1 Left: OEL CLOC camera system. Right: The camera system topside setup.

4.4. Grab sampling

Sediment samples were collected using a 0.1 m^2 Hamon grab (Plate 2).

At each station the grab sampler was deployed to the seabed using the vessel's crane. To ensure consistency in sampling, grab samples were screened by the lead environmental scientist and considered unacceptable if:

- The sample was less than 5 L. i.e., the sample represented less than half the 10 L capacity of the grab used.
- The jaws failed to close completely or were jammed open by an obstruction, allowing fines to pass through (washout or partial washout).
- The sample was taken at an unacceptable distance from the target location (beyond 20 m).

In the case of a suitable sample not being collected after three attempts within 20 m of the target sampling locations, the sampling location was to be moved up to 50 m from the original target location. If the location was within proximity to subsea infrastructure, the vessel was to be moved in the opposite direction to the hazard. If samples of less than 5 L were continually achieved, these samples were to be assessed on-site to establish if the sample volume was acceptable to allow subsequent analysis. No pooling of samples was undertaken. If no samples were acquired from the first 4 attempts, then the station was to be abandoned. Full grab survey logs and photos of samples are provided in Appendices III and IV.

4.4.1. Grab Sample Processing

- Initial visual assessment of sample size and acceptability made.
- Photograph of the sample with station details taken in grab and once released.
- Sample emptied onto 0.5 mm sieve net laid over 4.0 mm sieve table and washed through using gentle rinsing with seawater hose.
- Sample backwashed into a suitable sized sample container and diluted 10 % formalin solution added to fix the sample prior to laboratory analysis.
- Sample containers clearly labelled internally and externally with date, sample ID and project name.

Detailed field notes were taken including station number, fix number, number of attempts, sample volume, sediment type, conspicuous fauna, any sign of protected features and water depth.

Plate 2 0.1m^2 Hamon grab used for grab sampling.

5. Laboratory Analysis & Interpretation

5.1. Seabed Imagery Analysis

All seabed imagery analysis collected by DDC was undertaken in consideration of the latest NE Atlantic Marine Biological Analytical Quality Control (NMBAQC)/JNCC Epibiota Quality Assurance Framework (QAF) guidance and identification protocols available on the NMBAQC website. Final datasets are presented using the latest NMBAQC/JNCC epibiota monitoring proformas available for stills and video footage and were quality assured using the QAF form check and comparison tools.

The seabed imagery analysis was undertaken in two stages using the Bio-Image Indexing and Graphical Labelling Environment (BIIGLE) annotation platform (Langenkämper et al., 2017). The first stage, "Tier 1", consisted of labels that refer to the whole image being assigned providing appropriate metadata for the image including EUNIS habitat classifications assigned in line with (Parry, 2019). The second stage, "Tier 2", was used for establishing presence/absence of key epibiotic species within each image and to assign percentage cover of key reef attributes.

A full reef habitat assessment (HA) was conducted on all DDC imagery to determine whether habitats met the definitions of Annex I reef habitats as detailed in Table 3 and Table 4. The latest JNCC guidance on the characterisation of 'low resemblance' Annex I stony reef was also considered (Golding et al., 2020). The annotation label tree used during analysis had major headings for each of the reef types. Under each reef type, labels were assigned for each of the categories required to determine whether Annex I reef habitat is present.

Table 3 Characteristics of stony reef (Irving, 2009)**.**

Characteristic	'Reefiness'			
	Not a Reef	Low	Medium	High
Composition (proportion of boulders/cobbles (>64 mm))	<10 %	10-40 % matrix supported	40-95 %	>95 % clast-supported
Elevation	Flat seabed	<64 mm	64 mm - 5 m	>5 m
Extent	<25 m^2	>25 m^2		
Biota	Dominated by infaunal species	>80 % of species present composed of epibiotal species		

Table 4 Characteristics of *Sabellaria spinulosa* reef (Gubbay, 2007).

Characteristic	'Reefiness'			
	Not a Reef	Low	Medium	High
Elevation (cm)	< 2	2 - 5	5 – 10	> 10
Extent (m^2)	< 25	25 – 10,000	10,000 – 1,000,000	> 1,000,000
Patchiness (% Cover)	< 10	10 - 20	20 – 30	> 30

5.1.1. Tier 1 Analysis

The first stage, "Tier 1", consisted of assigning labels that referred to the whole image, providing appropriate metadata for the image. Metadata "Image Labels" included:

- Broadscale Habitat (BSH) type.
- Substrate type (and percentage cover in 10% intervals).
- Bedforms present.
- The presence of any Annex I habitats, FOCI, HOCI and Invasive Non-Native Species (INNS).
- The presence of any visible impacts or other modifiers (such as discarded fishing gear or marine litter (as per the Marine Strategy Framework Directive (MSFD) categories), visible physical damage to the seabed, evidence of strong currents, non-native species, etc.).
- Image quality categories (including "Not Analysable" category).

Depending on the presence of reef, labels also included:

- Extent: As it was not possible to fully determine the extent of reef habitats from a single image alone this label was used to identify areas that were highly unlikely to constitute reef habitats. An example is an image that showed a large boulder being preceded and succeeded by images of unconsolidated sandy sediments.
- Biota: Labels assigned to determine whether epifauna dominate the biological community observed.
- Elevation: Labels assigned depending on reef type. Laser points were used to assist in the assignment of categories.

5.1.2. Tier 2 Analysis

The second stage, "Tier 2", was used to assess epibiotal presence/absence data as "annotations" within each image for visible flora and fauna. This was undertaken as follows:

- Using the BIIGLE Annotation Platform, (detailed below) enumeration of visible taxa was undertaken using point annotation. A single representation of each taxa present was assigned a point to generate presence absence analysis.
- To assist the Tier 1 analysis of reef presence, polygons were drawn at the Tier 2 stage to delineate percentage cover of biogenic and geogenic reef features.

- Identification of any INNS and species non-native to UK waters. Information has also been included on species non-native to the local habitat types (e.g., hard-substrate specialists in a wider sedimentary habitat).

The substratum observed in each still image was recorded as a percentage cover using Collaborative and Annotation Tools for Analysis of Marine Imagery (CATAMI) (Althaus et al., 2015) substratum types where possible.

Determination of sediment type (such as coarse, mixed, sand etc.) was facilitated using the adapted Folk sediment trigon (Long, 2006) incorporated into a sediment category correlation table. Percentage cover of the different substrate types was used to determine and assign EUNIS codes and BSH.

5.2. PSD Analysis

PSD analysis of the sediment samples was undertaken by in-house laboratory technicians at OEL's NMBAQC participating laboratory in line with NMBAQC best practice guidance (Mason, 2022).

Frozen sediment samples were first transferred to a drying oven and thawed at 80°C for at least 6 hours before visual assessment of sediment type. Before any further processing (e.g., sieving or sub-sample removal), samples were mixed thoroughly with a spatula and all conspicuous fauna (>1 mm) which appeared to have been alive at the time of sampling were removed from the sample. A representative sub-sample of the whole sample was then removed for laser diffraction analysis before the remaining sample screened over a 1 mm sieve to sort coarse and fine fractions. The >1 mm fraction was then returned to a drying oven and dried at 80°C for at least 24 hours before dry sieving. Once dry, the sediment sample were run through a series of Endecott BS 410 test sieves (nested at 0.5 φ intervals) using a Retsch AS200 sieve shaker to fractionate the samples into particle size classes. The dry sieve mesh apertures used are given in Table 5.

Table 5 Sieve series employed for PSD analysis by dry sieving.

Sieve aperture (mm)												
63	45	32	22.5	16	11.2	8	5.6	4	2.8	2	1.4	1

The sample was then transferred onto the coarsest sieve at the top of the sieve stack and shaken for a standardised period of 20 minutes. The sieve stack was checked to ensure the components of the sample had been fractioned as far down the sieve stack as their diameter would allow.

The sub-sample for laser diffraction was first screened over a 1 mm sieve and the fine fraction residue (<1 mm sediments) transferred to a suitable container and allowed to settle for 24 hours before excess water syphoned from above the sediment surface until a paste texture was achieved. The fine fraction was then analysed by laser diffraction using a Beckman Coulter LS13 320.

The dry sieve and laser data was then merged for each sample with the results expressed as a percentage of the whole sample. Once data was merged, PSD statistics and sediment classifications were generated from the percentages of the sediment determined for each sediment fraction using Gradistat v9.1 software.

Sediment descriptions are defined by their size class based on the Wentworth classification system (Wentworth, 1922) (Table 6). Sediment data collected across the three replicates were first averaged for each station. Statistics such as mean and median grain size, sorting coefficient, skewness and bulk sediment classes (percentage silt, sand and gravel) were then derived following the Folk classification (Folk, 1954).

Table 6 The classification used for defining sediment type based on the Wentworth Classification System (Wentworth, 1922).

Wentworth Scale	Phi Units (φ)	Sediment Types
>64 mm	<-6	Cobble and boulders
32 – 64 mm	-5 to -6	Pebble
16 – 32 mm	-4 to -5	Pebble
8 – 16 mm	-3 to -4	Pebble
4 - 8 mm	-3 to -2	Pebble
2 - 4 mm	-2 to -1	Granule
1 - 2 mm	-1 to 0	Very coarse sand
0.5 - 1 mm	0 – 1	Coarse sand
250 - 500 µm	1 – 2	Medium sand
125 - 250 µm	2 – 3	Fine sand
63 - 125 µm	3 – 4	Very fine sand
31.25 – 63 µm	4 – 5	Very coarse silt
15.63 – 31.25 µm	5 – 6	Coarse silt
7.813 – 15.63 µm	6 – 7	Medium silt
3.91 – 7.81 µm	7 – 8	Fine silt
1.95 – 3.91 µm	8 – 9	Very fine silt
<1.95 µm	<9	Clay

5.3. Macrobenthic Analysis

All elutriation, extraction, identification, and enumeration were undertaken at OEL's NMBAQC scheme participating laboratory in line with the NMBAQC Processing Requirement Protocol (Worsfold & Hall, 2010) . All processing information and macrobenthic records was recorded using OEL's cloud-based data management application ABACUS that employs MEDIN validated, controlled vocabularies ensuring all sample information, nomenclature, qualifiers, and metadata are recorded in line with international data standards.

For each macrobenthic sample, the excess formalin was drained off into a labelled container over a 0.5 mm mesh sieve in a well-ventilated area. The samples were then re-sieved over a 0.5 mm mesh sieve to remove all remaining fine sediment and fixative. The low-density fauna was then separated by elutriation with freshwater, poured over a 1 mm mesh sieve, transferred into a Nalgene and preserved in 70 % Industrial Denatured Alcohol (IDA). The remaining sediment from each sample was subsequently separated into 0.5 mm, 1 mm, 2 mm and 4 mm fractions and sorted under a stereomicroscope to extract any remaining fauna (e.g., high-density bivalves not 'floated' off during elutriation).

All fauna present was identified to species level, where possible, and enumerated by trained benthic taxonomists using the most up to date taxonomic literature and checks against existing reference collections. Nomenclature utilises the live link within ABACUS to the World Register of Marine Species (WoRMS) web services to ensure the most up to date taxonomic classifications are recorded. Colonial fauna (e.g., hydroids and bryozoans) were identified to species level where possible and recorded as present (P). For subsequent data analysis, taxa recorded as P were given the numerical value of 1. A full reference collection was retained including at least one example specimen of each taxon.

Biomass was measured as blotted wet weight in grams to at least 4 decimal places for all countable taxa (i.e., at species level where possible). As a standard, the conventional conversion factors as defined by (Eleftheriou & Basford, 1989) was applied to biomass data to provide equivalent dry weight biomass (Ash Free Dry Weight (AFDW)).

The conversion factors applied are as follows:

- Annelida = 15.5%
- Crustacea = 22.5%
- Mollusca = 8.5%
- Echinodermata = 8.0%
- Miscellaneous = 15.5

5.3.1. Data Truncation and Standardisation

The macrobenthic species list was checked using the R package '*worms*' (Holstein, 2018) to check against WoRMS taxon lists and standardise species nomenclature. Once the species nomenclature was standardised in accordance with WoRMS accepted species names, the species list was examined carefully by a senior taxonomist to truncate the data, combining species records where differences in taxonomic resolution were identified.

5.3.2. Pre-Analysis Data Treatment

All data were collated in excel spreadsheets and made suitable for statistical analysis. All data processing and statistical analysis was undertaken using R v 1.2 1335 (R Core Team, 2022) and PRIMER v7 (Clarke & Gorley, 2015) software packages.

In accordance with the OSPAR Commission guidelines (OSPAR, 2004) records of colonial, meiofaunal, parasitic, egg and pelagic taxa (e.g., epitokes and larvae) were recorded, but were excluded when calculating diversity indices and conducting multivariate analysis of community structure. Newly settled juveniles of macrobenthic species may at times dominate the macrobenthos, however the OSPAR (2004) guidelines suggest they should be considered an ephemeral component due to heavy post-settlement mortality and not therefore representative of prevailing bottom conditions (OSPAR, 2004). OSPAR (2004) further states that "Should juveniles appear among the ten most dominant organisms in the data set, then statistical analyses should be conducted both with and without these in order to evaluate their importance". As juveniles of *Abra* and *Spisula* appeared in the top ten of the most dominant taxa across survey area, a 2STAGE analysis was conducted to compare the two data sets (with and without juveniles) which revealed a high level of similarity (~98 %) between the two and therefore juveniles were retained in the dataset for all further analyses and discussion.

In accordance with NMBAQC PRP (Worsfold & Hall, 2010), Nematoda were recorded during the macrobenthic analysis and included in all datasets for all further analyses and discussion.

5.3.3. Univariate Statistics

The vegan package in R Studio (Oksanen et al., 2012) was used to calculate diversity indices for the macrobenthic and epibenthic data including:

- Number of Species (S): the number of taxa present in a sample, with no indication of relative abundances.
- Number of individuals (N): total number of individuals counted.

5.3.4. Multivariate Statistics

Prior to multivariate analyses, data were displayed as a shade plot with linear grey-scale intensity proportional to macrobenthic abundance (Clarke et al., 2014) to determine the most efficient pre-treatment method. Macrobenthic abundance from grab sample data was square root transformed to prevent taxa with intermediate abundances from being discounted from the analysis.

To fully investigate the multivariate patterns in the biotic data, a suite of analytical routines was employed as summarised below and described in detail in Appendix V.

5.4. Determining EUNIS Classifications

Sampling stations were grouped based on their macrobenthic assemblage composition using hierarchical clustering; the SIMPER routine was then applied to identify key and characterising taxa that contributed the most to the similarity within each group. EUNIS classifications were then assigned to each sampling station based on their macrobenthic group and key, characterising taxa as well as based on their sediment type and composition following the latest JNCC guidance (Parry, 2019).

6. Results

6.1. Seabed Imagery Analysis

Digital photographic stills and video footage were obtained at nine DDC transects and four kelp transects across the survey area. This resulted in the collection of 415 still images and 27 videos which were analysed to identify the BSH and biotopes across the survey area. Images were further assessed to inform on the distribution and extent of any protected and/or sensitive habitats and species (e.g., Annex I reef features/ PMFs).

Eight BSHs, four EUNIS Level 4, thirteen EUNIS Level 5, and six EUNIS Level 6 were identified in the seabed imagery collected (Figure 3 to Figure 6, and Table 7). The dominant BSH observed was A5.5, characterised as 'Subtidal Macrophyte Dominated Sediment'. This classification was identified at six DDC transects, and three kelp transects. The most frequently identified EUNIS biotope at these transects was A5.521, described as '*Laminaria saccharina* and red seaweeds on infralittoral sediments', which includes potential PMF habitat 'Kelp and Seaweed Communities on Sublittoral Sediment'. The second dominant BSH observed was A5.4 'Subtidal Mixed Sediment'. This was identified at six DDC transects, and one kelp transect within the survey area. The most commonly identified EUNIS habitat at these transects was A5.43 'Infralittoral mixed sediments'.

DDC video and stills logs are presented in Appendices I and II, respectively. Example imagery is presented in Plate 3

The most common epifauna and macroalgae observed in the seabed imagery for the DDC transects included the tube worms *Serpulidae,* macroalgae including reds (Calcareous), and browns (*Laminaria* sp. and *Saccharina latissima)* and the bryozoan *Electra Pilosa*. For the kelp transects the scene was similar to the one observed for the DDC transects (Plate 4).

Table 7 EUNIS BSH and biotope complexes identified in seabed imagery throughout the survey area.

BSH	EUNIS Code	EUNIS Description
A3.1	A3.115	*Laminaria hyperborea* with dense foliose red seaweeds on exposed infralittoral rock
	A3.116	Foliose red seaweeds on exposed lower infralittoral rock
	A3.125	Mixed kelps with scour-tolerant and opportunistic foliose red seaweeds on scoured or sand-covered infralittoral rock
	A3.126	*Halidrys siliquosa* and mixed kelps on tide-swept infralittoral rock with coarse sediment
A3.2	A3.2121	*Laminaria hyperborea* forest, foliose red seaweeds and a diverse fauna on tide-swept upper infralittoral rock
	A3.2143	Grazed *Laminaria hyperborea* forest with corraline crusts on upper infralittoral rock
	A3.222	Mixed kelp and red seaweeds on infralittoral boulders, cobbles and gravel in tidal rapids
A3.3	A3.3131	*Laminaria saccharina* and *Laminaria digitata* on sheltered sublittoral fringe rock
	A3.322	*Laminaria saccharina* and *Psammechinus miliaris* on variable salinity grazed infralittoral rock
A4.1	-	High Energy Circalittoral Rock
A4.2	A4.2142	*Alcyonium digitatum*, *Pomatoceros triqueter*, algal and bryozoan crusts on wave-exposed circalittoral rock
A5.1	A5.131	Sparse fauna on highly mobile sublittoral shingle (cobbles and pebbles)
A5.4	A5.43	Infralittoral mixed sediments
	A5.445	*Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment
A5.5	A5.5211	Red seaweeds and kelps on tide-swept mobile infralittoral cobbles and pebbles
	A5.5212	*Laminaria saccharina* and robust red algae on infralittoral gravel and pebble
	A5.5213	*Laminaria saccharina* and filamentous red algae on infralittoral sand
	A5.523	*Laminaria saccharina* with *Psammechinus miliaris* and/or *Modiolus modiolus* on variable salinity infralittoral sediment

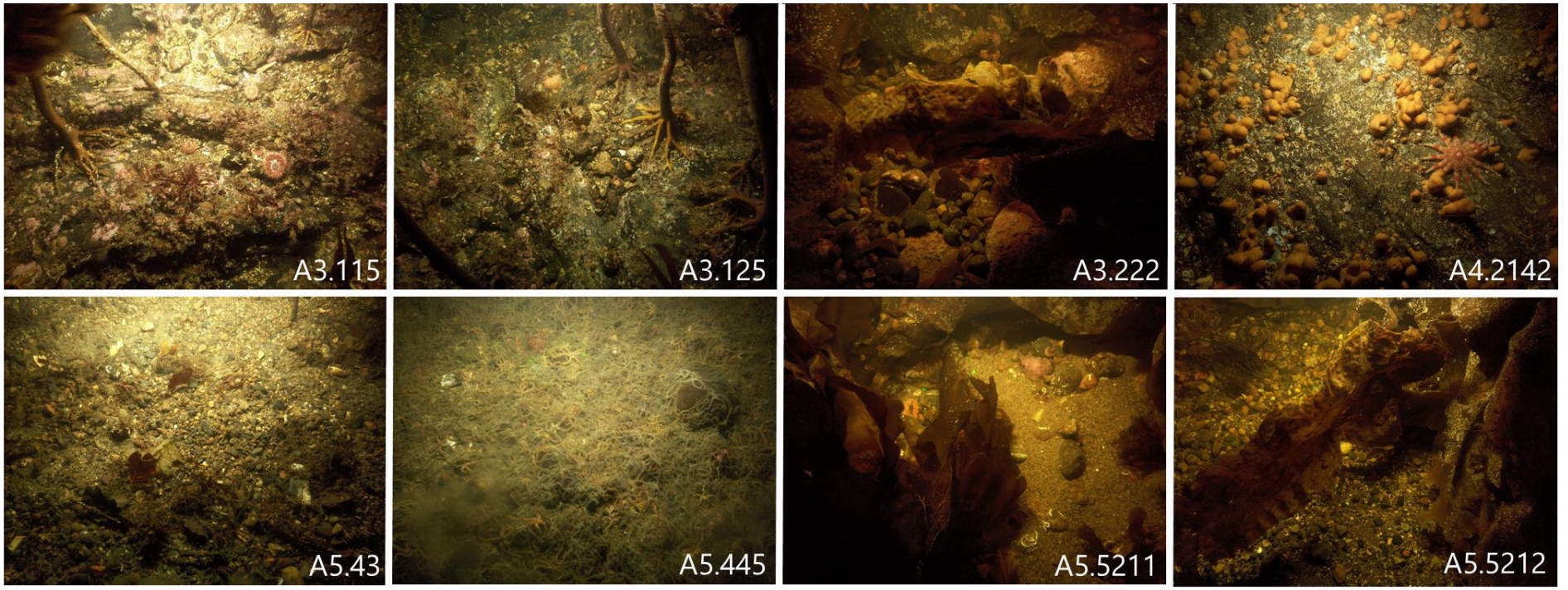

Plate 3 Examples of the most common habitats and biotopes captured via DDC across the survey area. Clockwise from top left: T08, T06, T04, T07, T02, T01, T05, and T04.

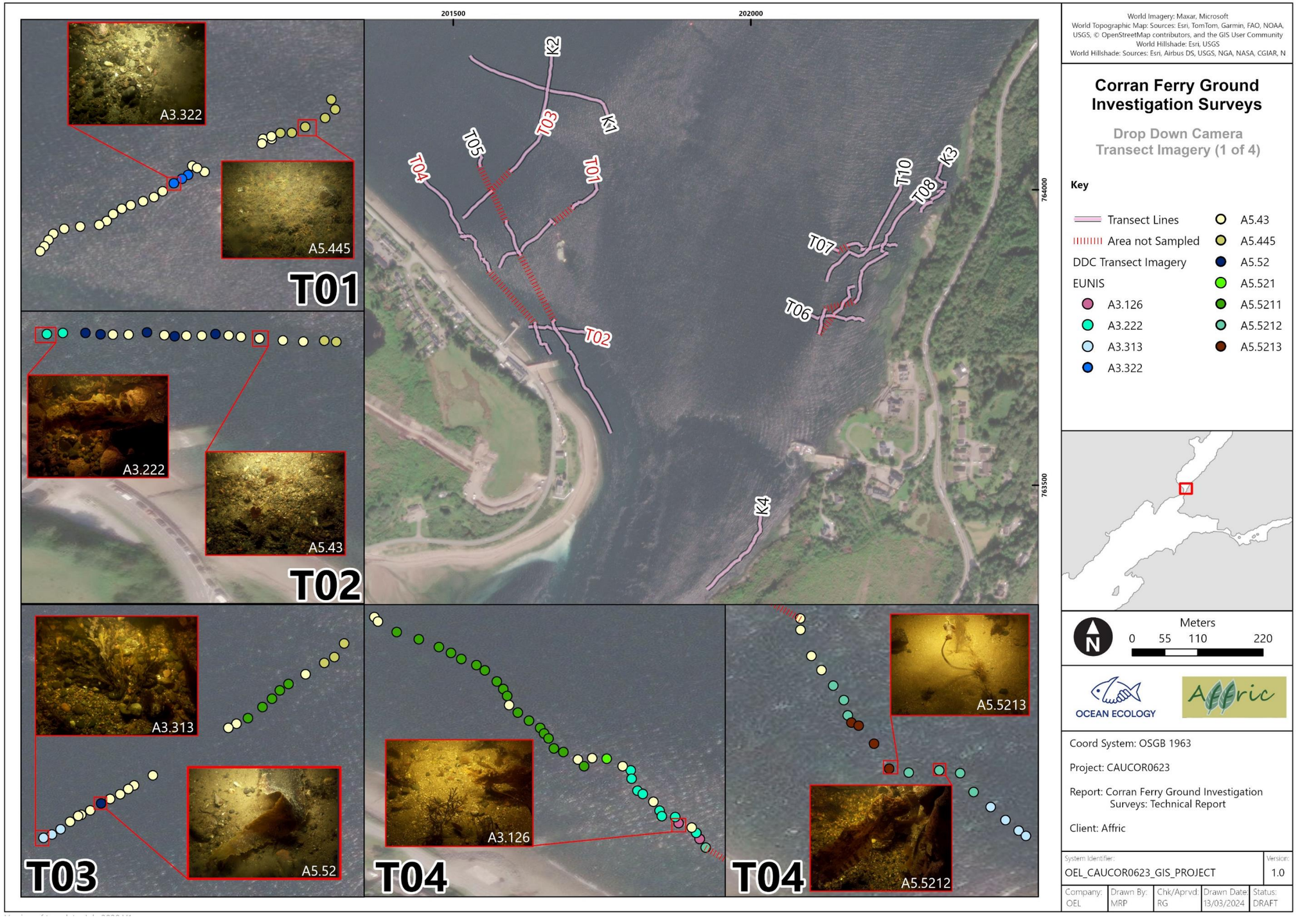

Figure 3 EUNIS classifications derived from seabed imagery collected along transects in the survey area (1 of 4).

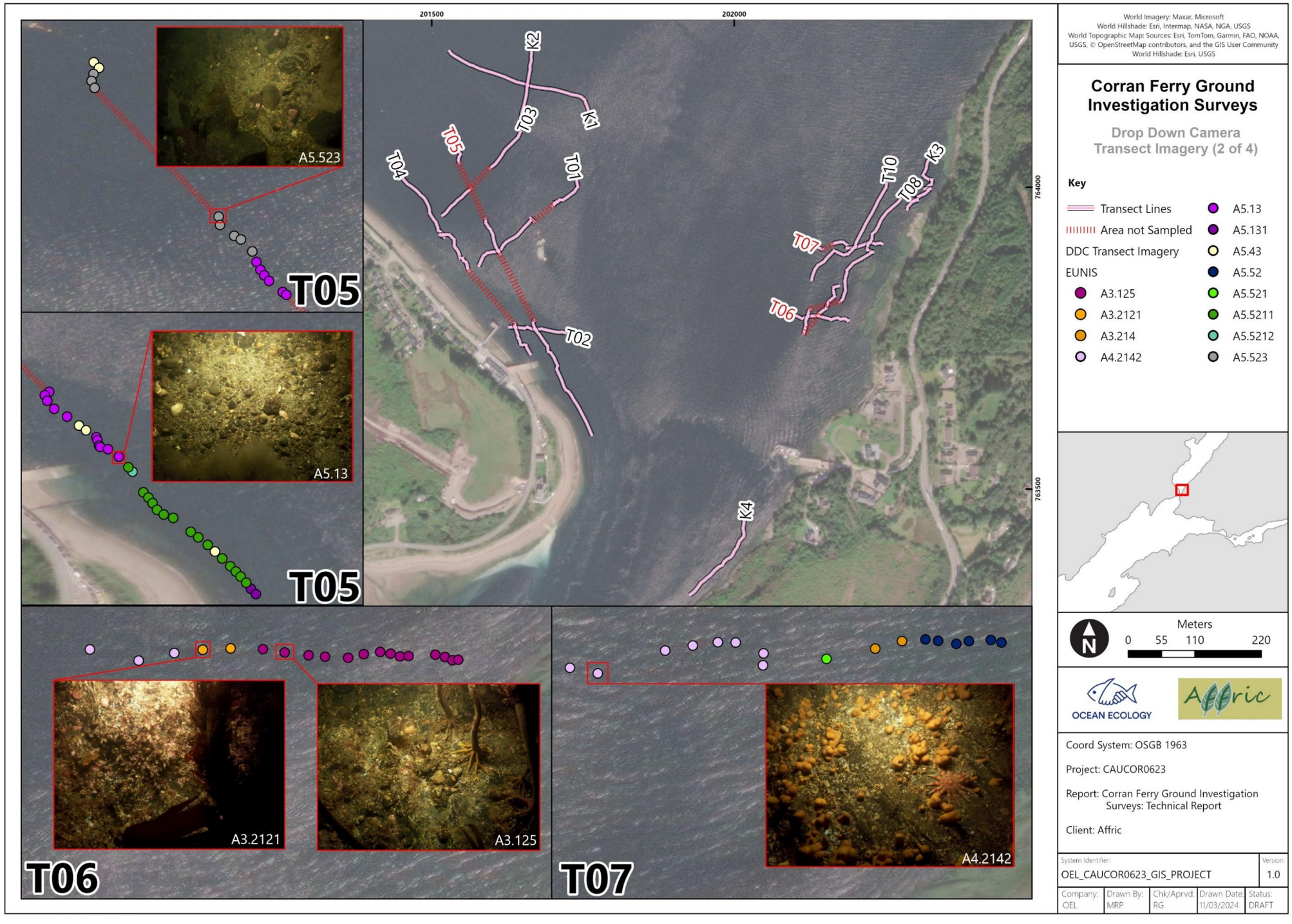

Figure 4 EUNIS classifications derived from seabed imagery collected along transects in the survey area (2 of 4).

Figure 5 EUNIS classifications derived from seabed imagery collected along transects in the survey area (3 of 4).

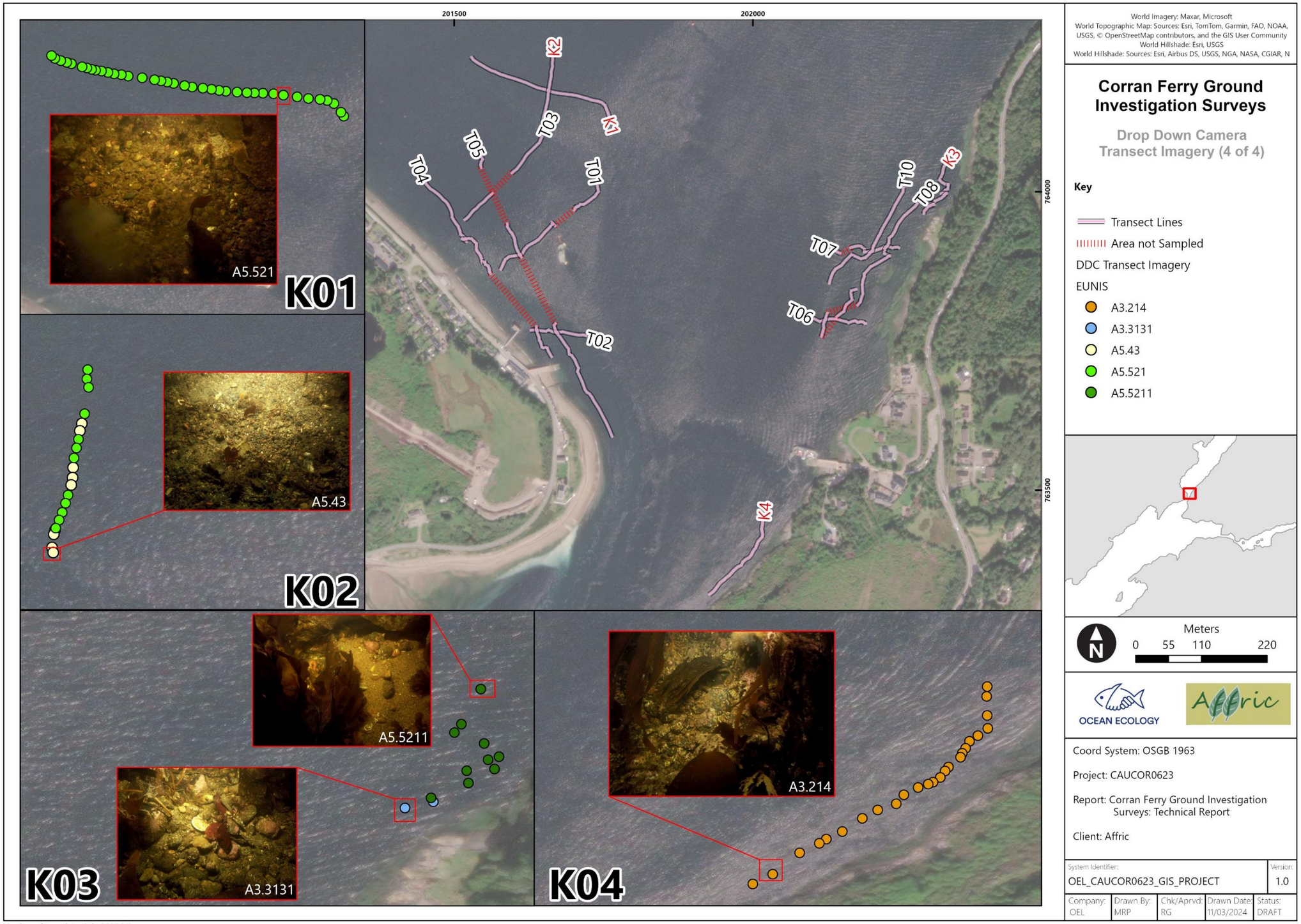

Figure 6 EUNIS classifications derived from seabed imagery collected along transects in the survey area (14 of 4).

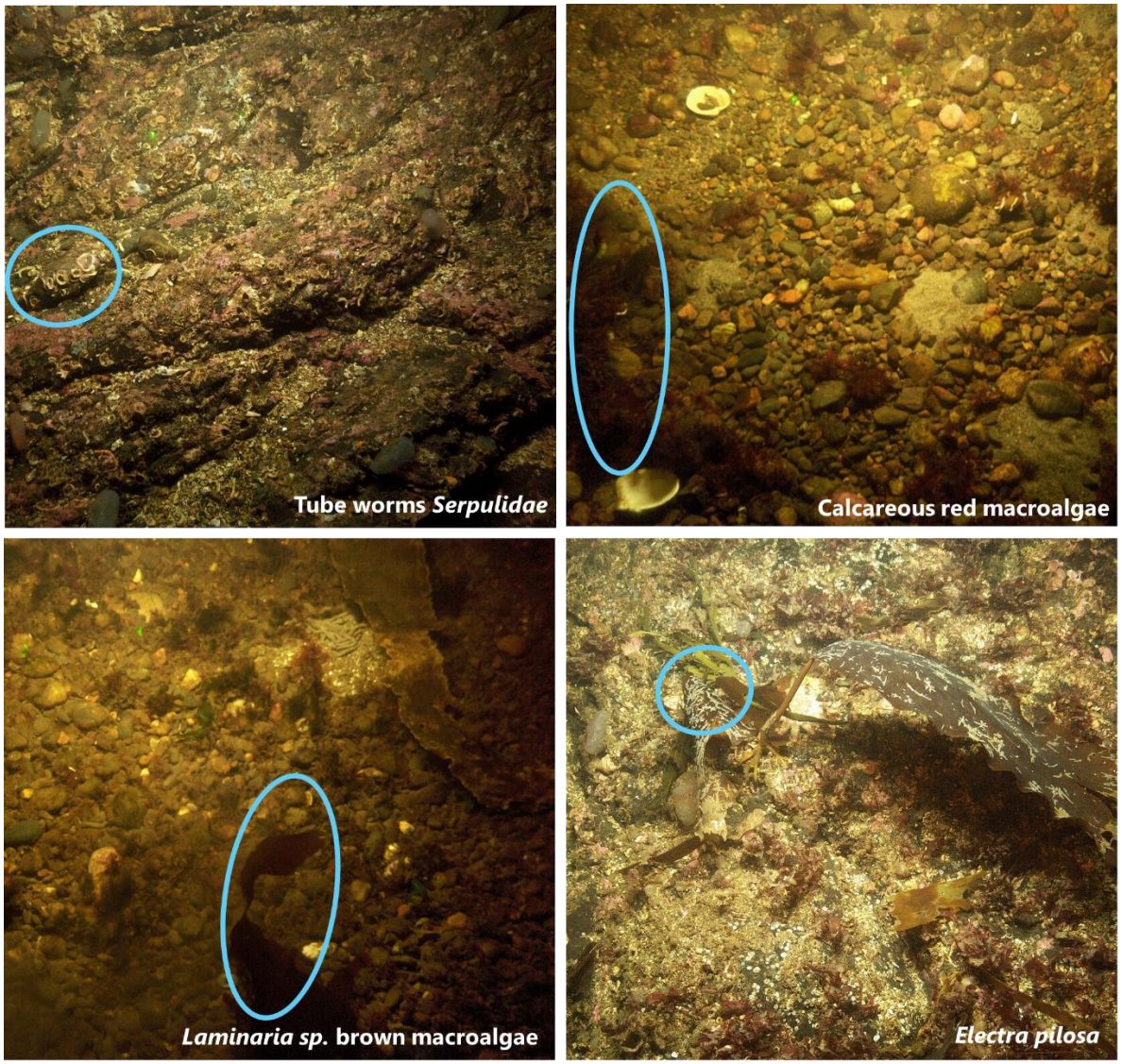

Plate 4 Examples of common epifaunal and macroalgae taxa identified across the survey area. Clockwise from top left: T07, K1, K1 and T10.

6.1.1. Annex I Reef Assessment

A comprehensive Annex I reef assessment was conducted on all imagery (Table 8). Annex I reef was observed within 111 images throughout the survey area (Plate 5).

Table 8 Annex I reef assessment results.

Annex I Reef	Transects	Kelp Transects
Low stony	T04, T05, and T08	K3 and K4
Low stony and bedrock		K4
Bedrock	T06, T07, T08, and T010	K4
Bedrock and low stony	T08	

Results of the Annex I reef assessment are presented spatially in Figure 7 to Figure 8 and full assessment proforma is provided in Appendix VII.

Plate 5 Examples of Annex I reef habitats identified across the survey area. Clockwise from top left: T04, K4, T08, T08.

6.1.2. PMF Assessment

The PMF habitats 'Kelp Beds' and 'Kelp and Seaweed Communities on Sublittoral Sediment' were identified in 52 images for Kelp Beds and 137 images for 'Kelp and Seaweed Communities on Sublittoral Sediment'(Figure 7 to Figure 10, Table 7 and Appendix VI). The biotope A3.322 '*Laminaria saccharina* and *Psammechinus miliaris* on variable salinity grazed infralittoral rock' was identified in three images on Transect T01 and was the biotope component of PMF habitat 'Low or Variable Salinity Habitats'. The biotopes A3.222 'Mixed kelp and red seaweeds on infralittoral boulders, cobbles and gravel in tidal rapids', and A3.126 '*Halidrys siliquosa* and mixed kelps on tide-swept infralittoral rock with coarse sediment' were identified in 12 images from two transects (T02 and T04) and were the biotope components of the PMF habitat 'Tide-Swept Algal Communities' (Plate 6).

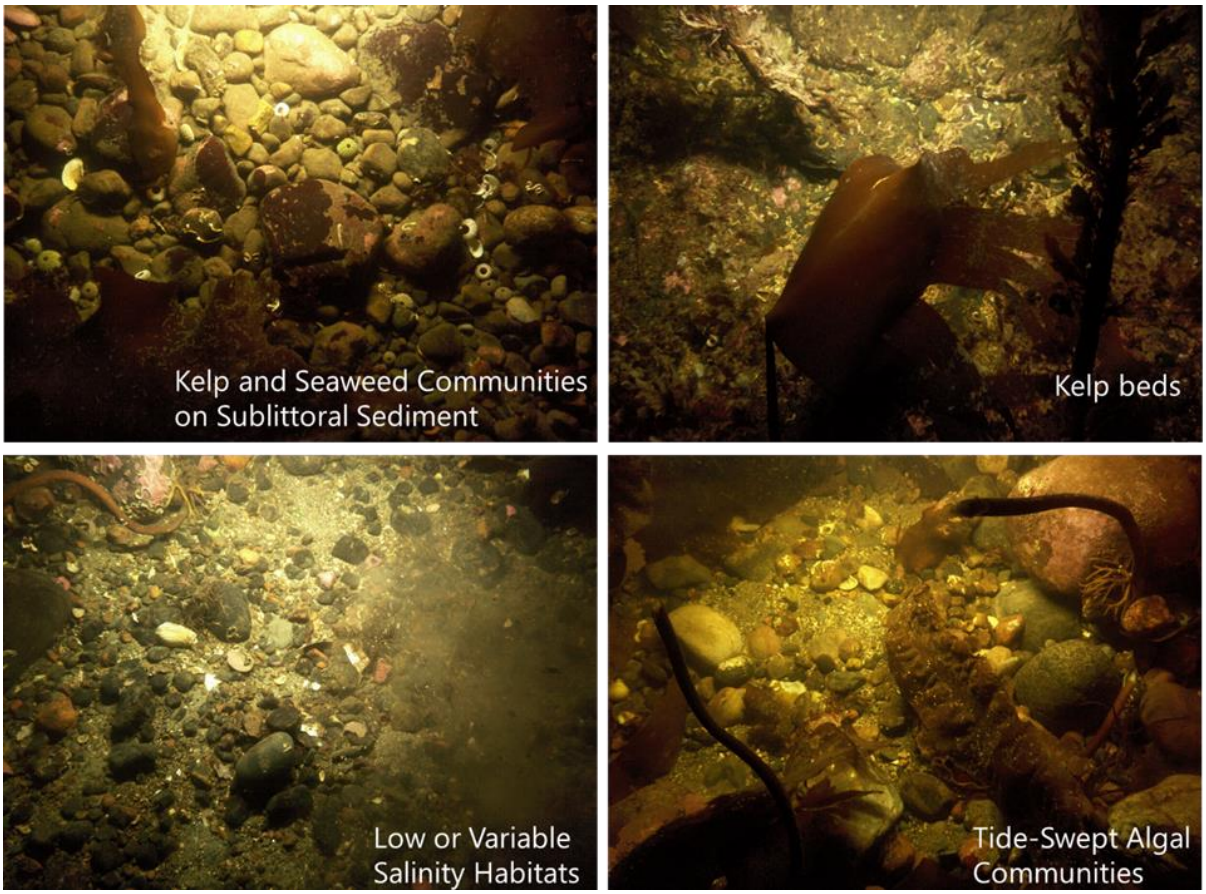

Plate 6 Examples of PMF habitats found across the survey area. Clockwise from top to left: K1, K4, T01, T04.

Table 9 EUNIS BSH and biotope complexes identified in seabed imagery throughout the survey area.

PMF	EUNIS
Kelp and Seaweed Communities on Sublittoral Sediment	A5.52, A5.521, A5.5211, A5.5212, A5.5213, A5.523
Kelp Beds	A3.115, A3.21.21, A3.214, A3.2143
Low or Variable Salinity Habitats	A3.322
Tide-Swept Algal Communities	A3.126, A3.222

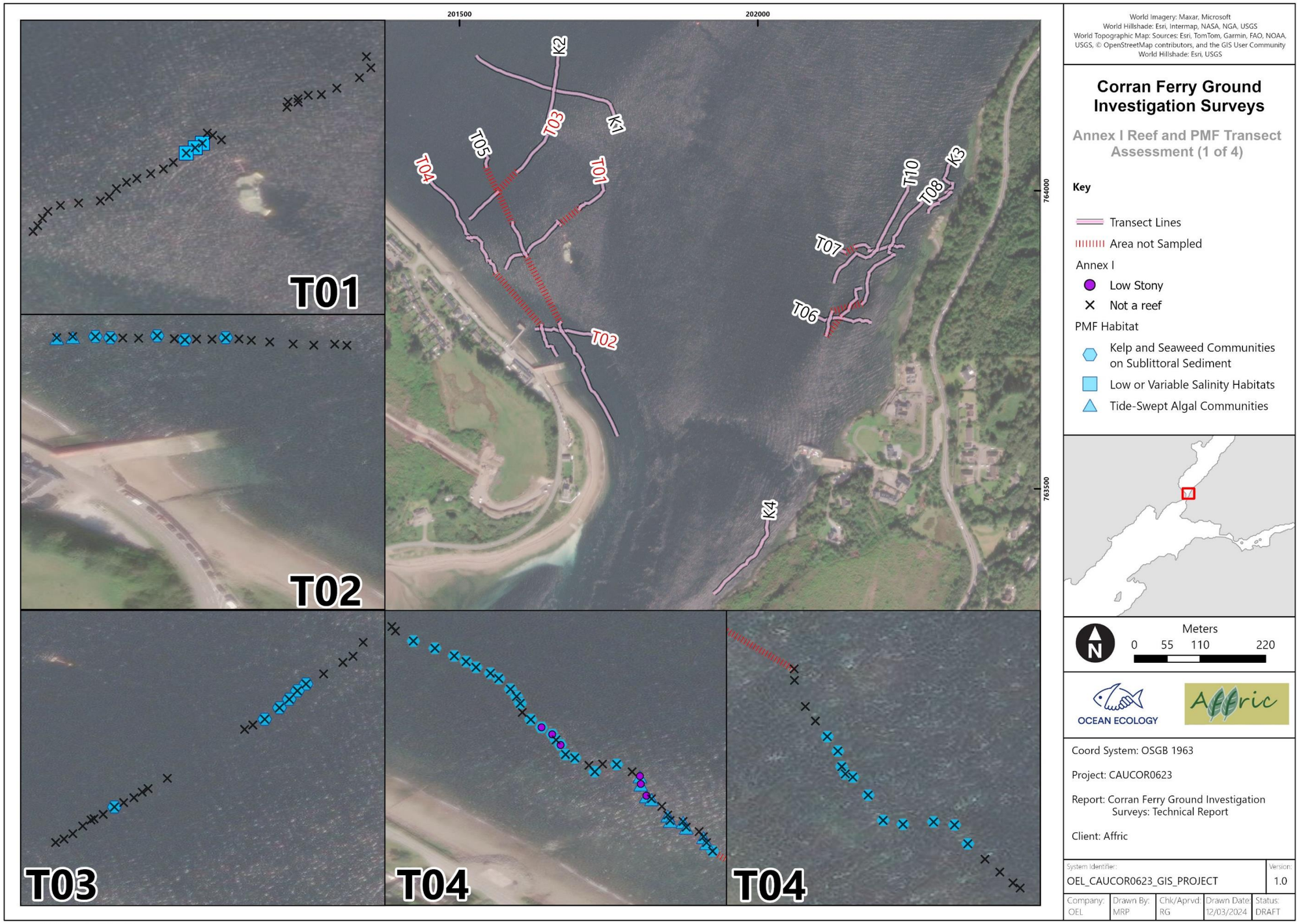

Figure 7 Annex I and PMFs identified in the survey area (1 of 4).

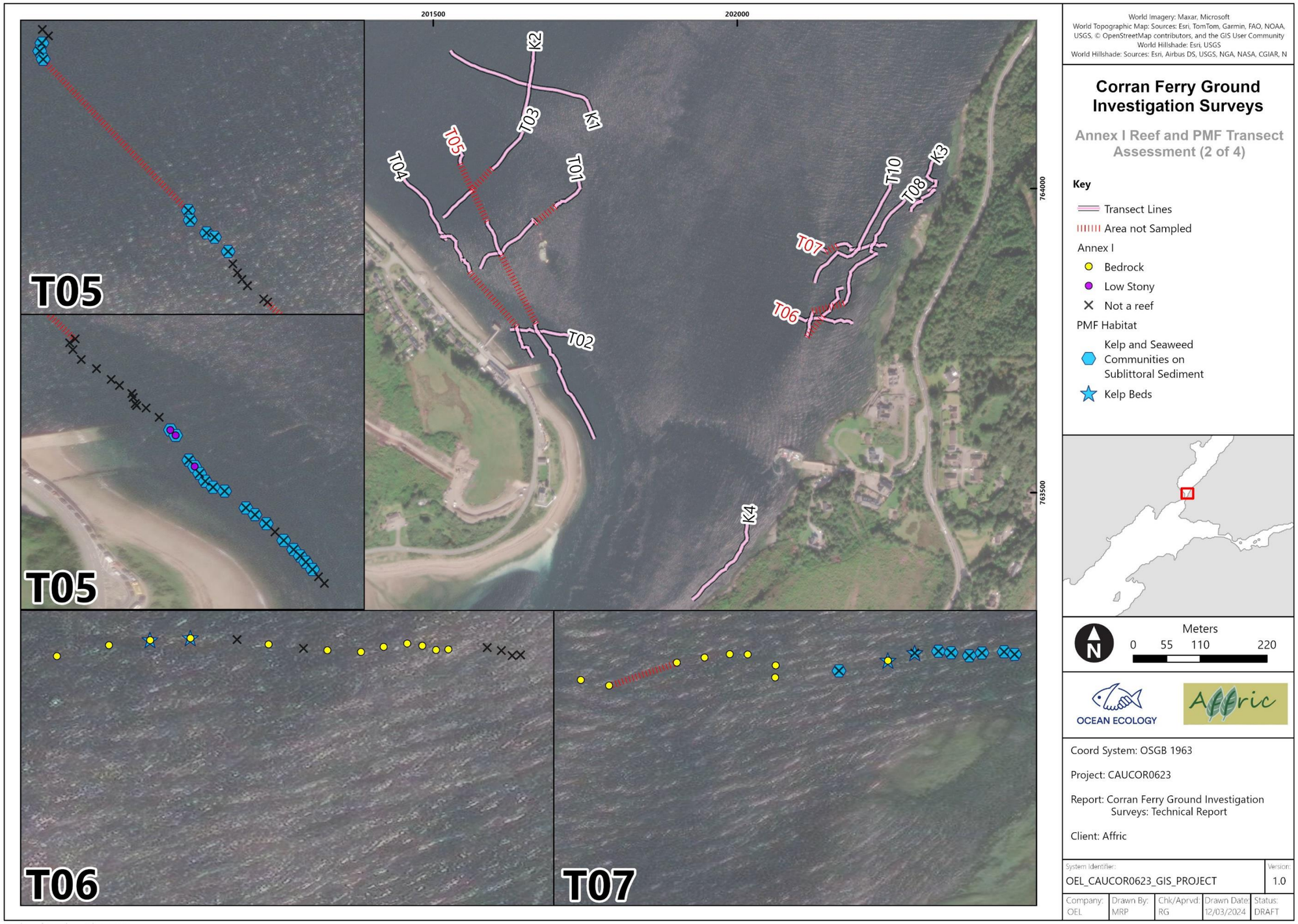

Figure 8 Annex I and PMFs identified in the survey area (2 of 4).

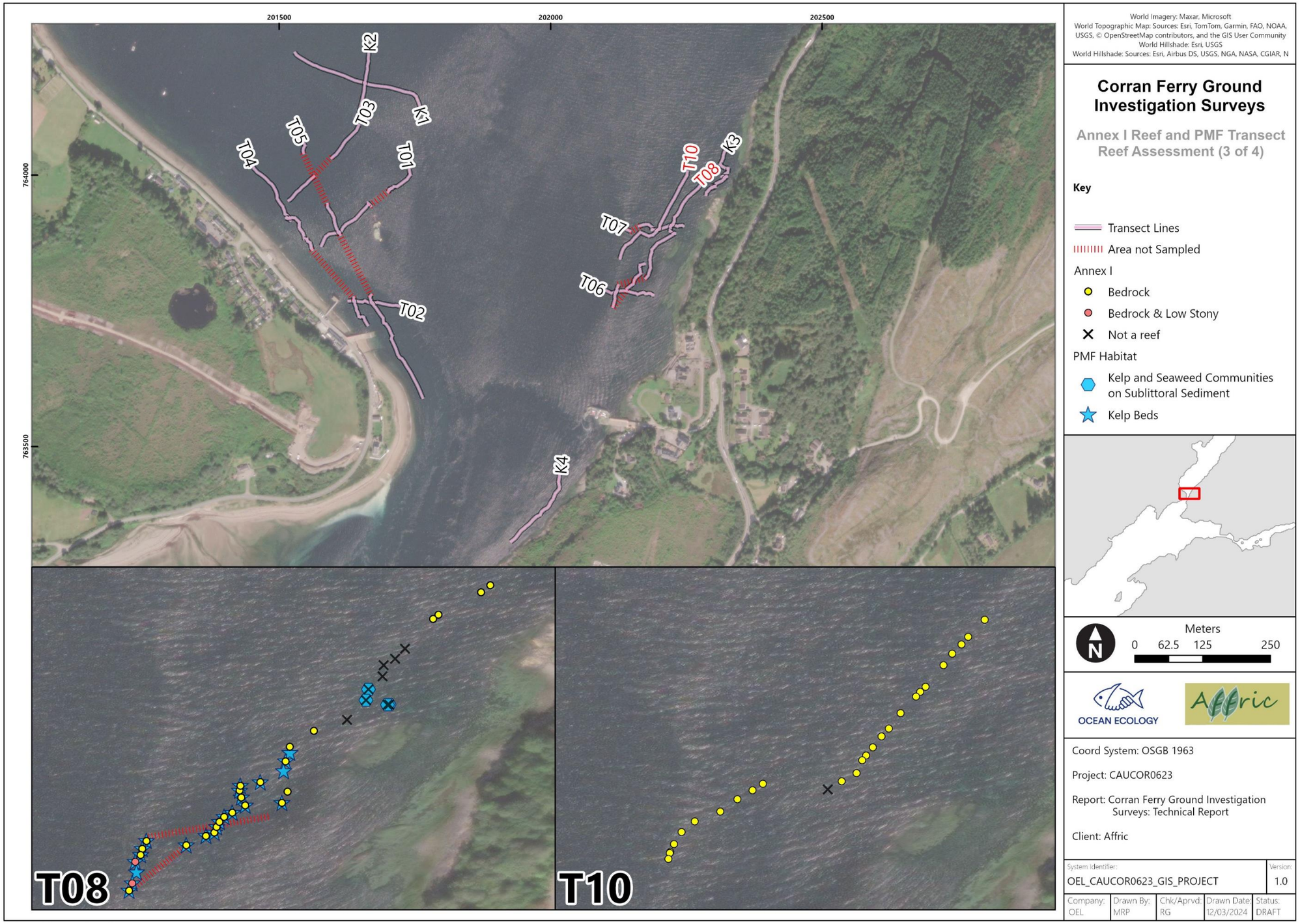

Figure 9 Annex I and PMFs identified in the survey area (3 of 4).

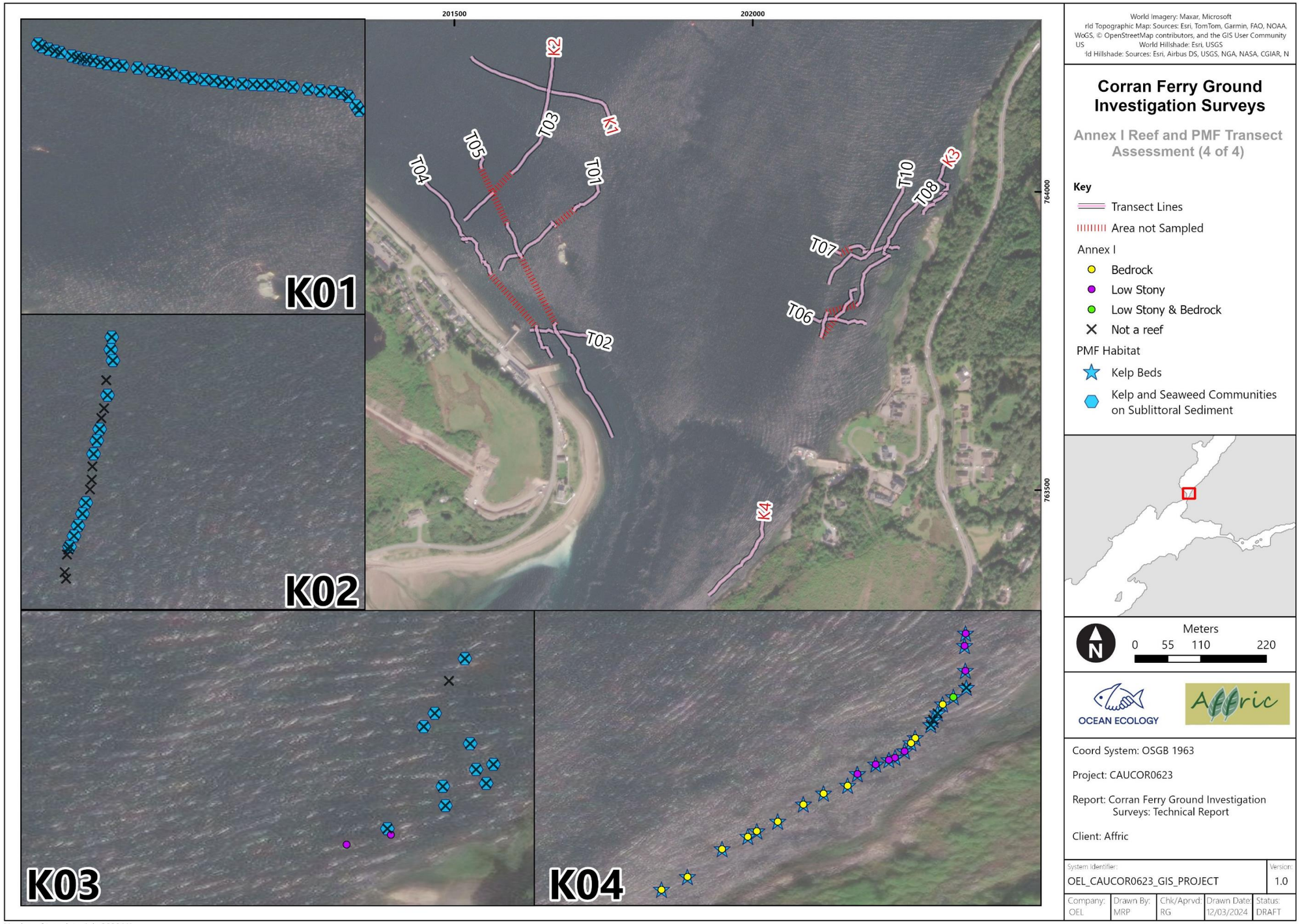

Figure 10 Annex I and PMFs identified in the survey area (4 of 4).

6.2. PSD Data

In total, 7 sediment samples were analysed for full particle size classification. Example images of all sampled sediment types are presented in Plate 7 with full particle size data provided in Appendix VIII and summary data provided in Appendix IX.

6.3. Sediment Type

Sediment types, as classified using the Folk triangle (Folk, 1954) for each station sampled across the survey area are presented in Figure 11. Each Folk classification was converted to BSH type (EUNIS Level 3) using the adapted Folk triangle (Long, 2006). Sediments were heterogeneous across the survey area, characterized by contributions of sand and gravel at all stations, with mud present in minimal quantities. Sediment textural group and BSH are mapped in Figure 12 and Figure 13.

Of the 7 stations sampled, 4 were representative of EUNIS BSH A5.4 (Mixed Sediment), all of which were classified by the textural group Muddy Sandy Gravel (msG). The other three stations were representative EUNIS BSH A5.1 (Coarse Sediment) and included the textural groups Gravelly Sand (gS) and Sandy Gravel (sG) (Figure 11).

6.4. Sediment Composition

Sediment was characterised by a predominance of sand and gravel and varying, generally low mud content across the survey. The percentage contribution of gravels (> 2 mm), sands (63 µm to 2 mm), and fines (< 63 µm) at each station are presented in Figure 13. The mean proportion (± Standard Error, SE) of sands across all stations was 49 % (± 7 %), the mean (± SE) gravel and mud content across the survey area was 45 % (± 7 %) and 6% (± 2 %) respectively. Spatial trends of sediment composition are mapped in Figure 14.

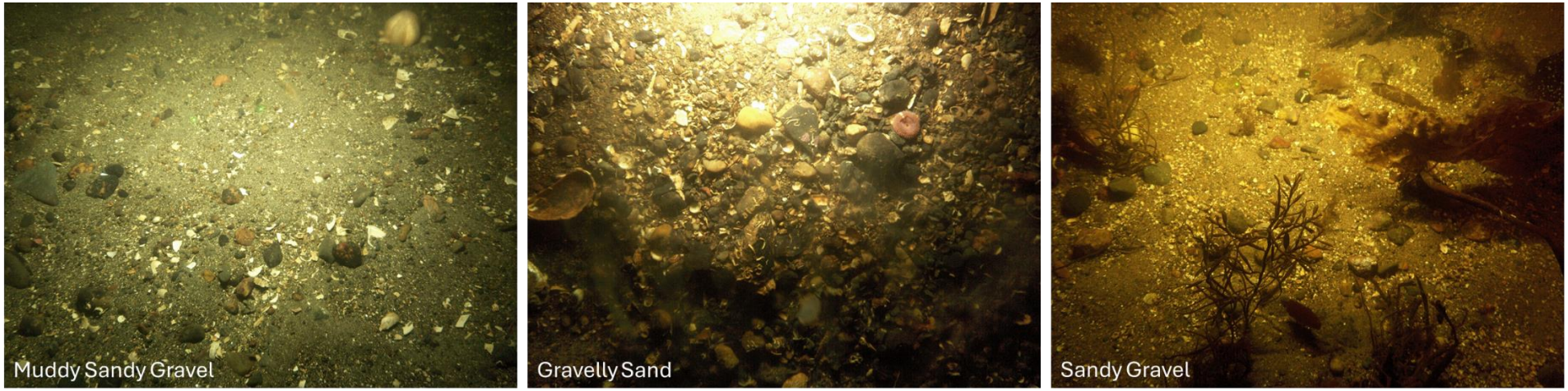

Plate 7 Sediment types sampled. Left to right: ST01, Muddy Sandy Gravel (msG). ST02, Gravelly Sand (gS). ST04, Sandy Gravel (sG).

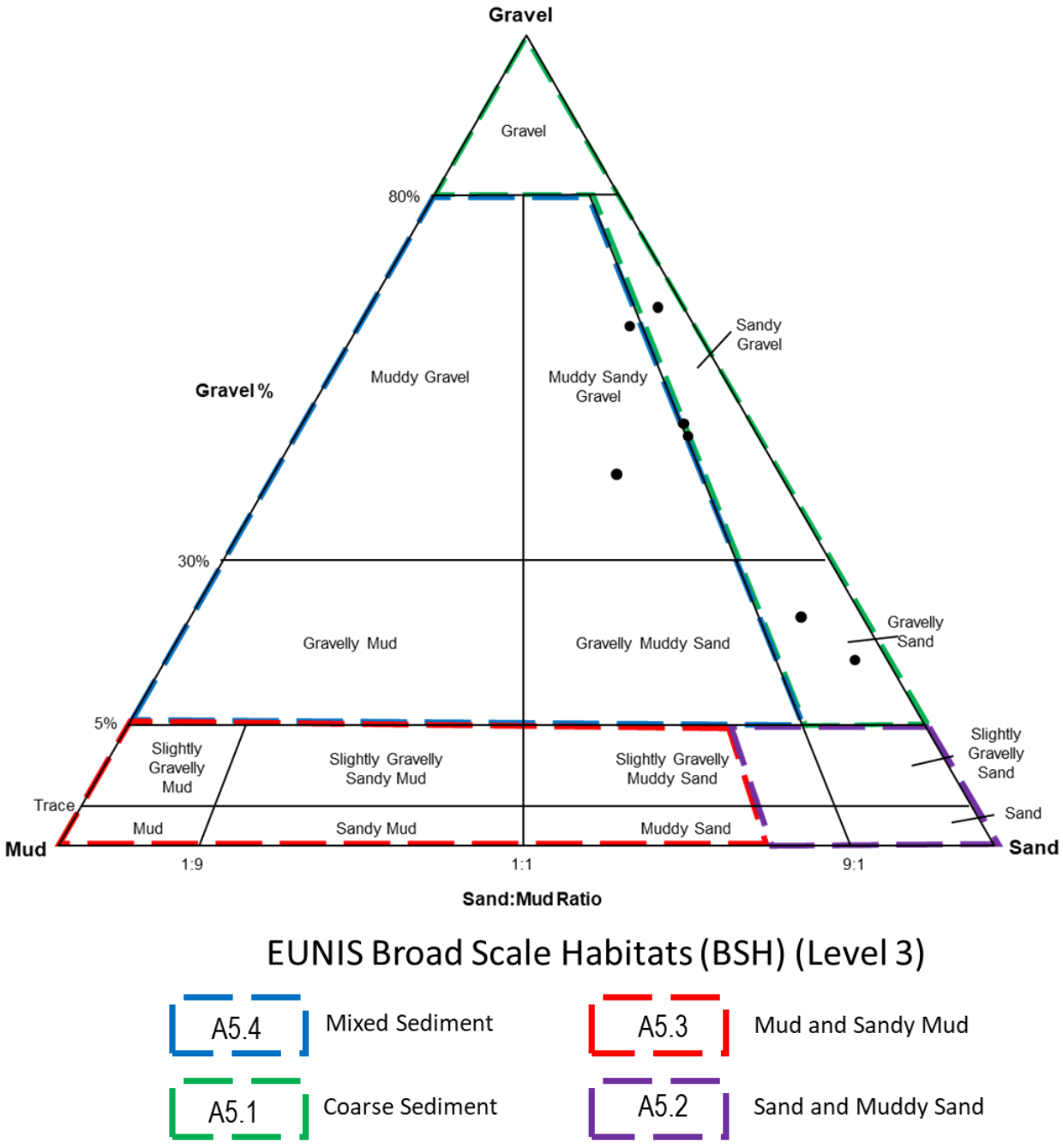

Figure 11 Folk (1954) triangle classifications of sediment gravel percentage and the sand-to-mud ratio of samples collected across the ruptured pipeline subtidal sampling area, overlain by the modified Folk triangle for determination of mobile sediment BSHs under the EUNIS habitat classification system (adapted from (Long 2006)).

Figure 12 EUNIS BSH classification as determined based on PSD of sampled collected during the survey.

Figure 13 Textural Groups as determined from PSD analysis of samples acquired during the survey.

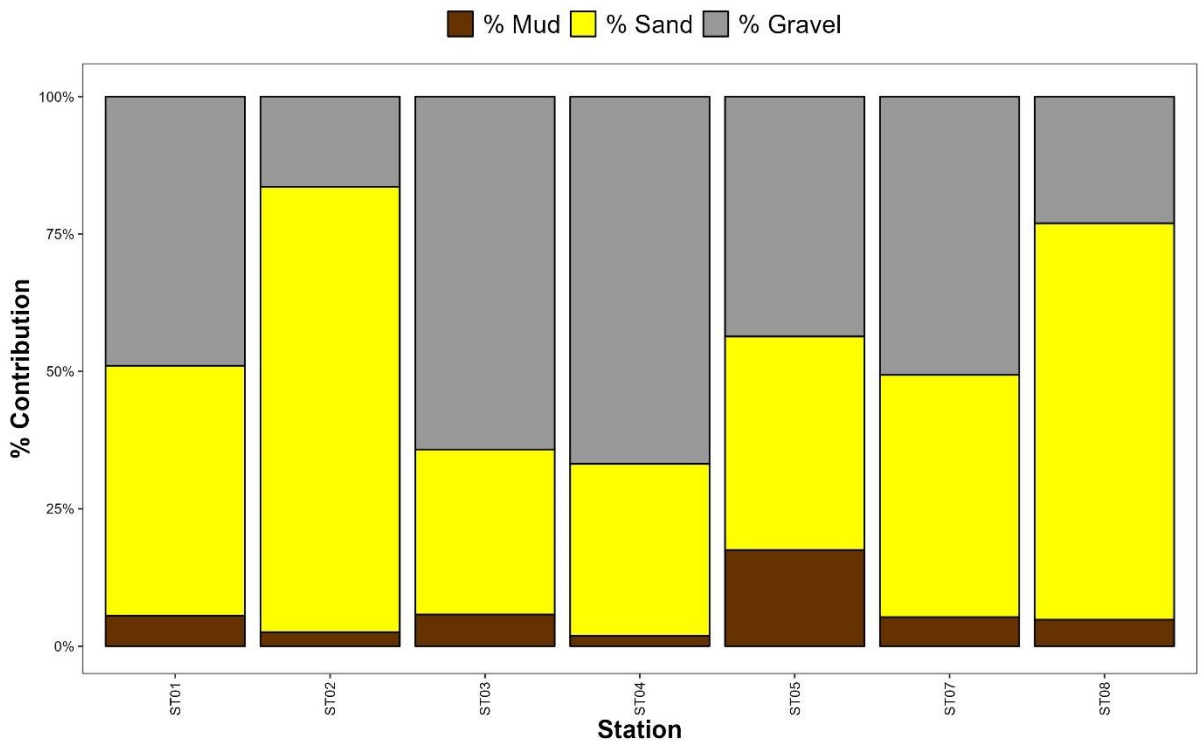

Figure 14 Relative contribution of major sediment fractions (Gravel, Sand, Mud) by volume at each sampling station.

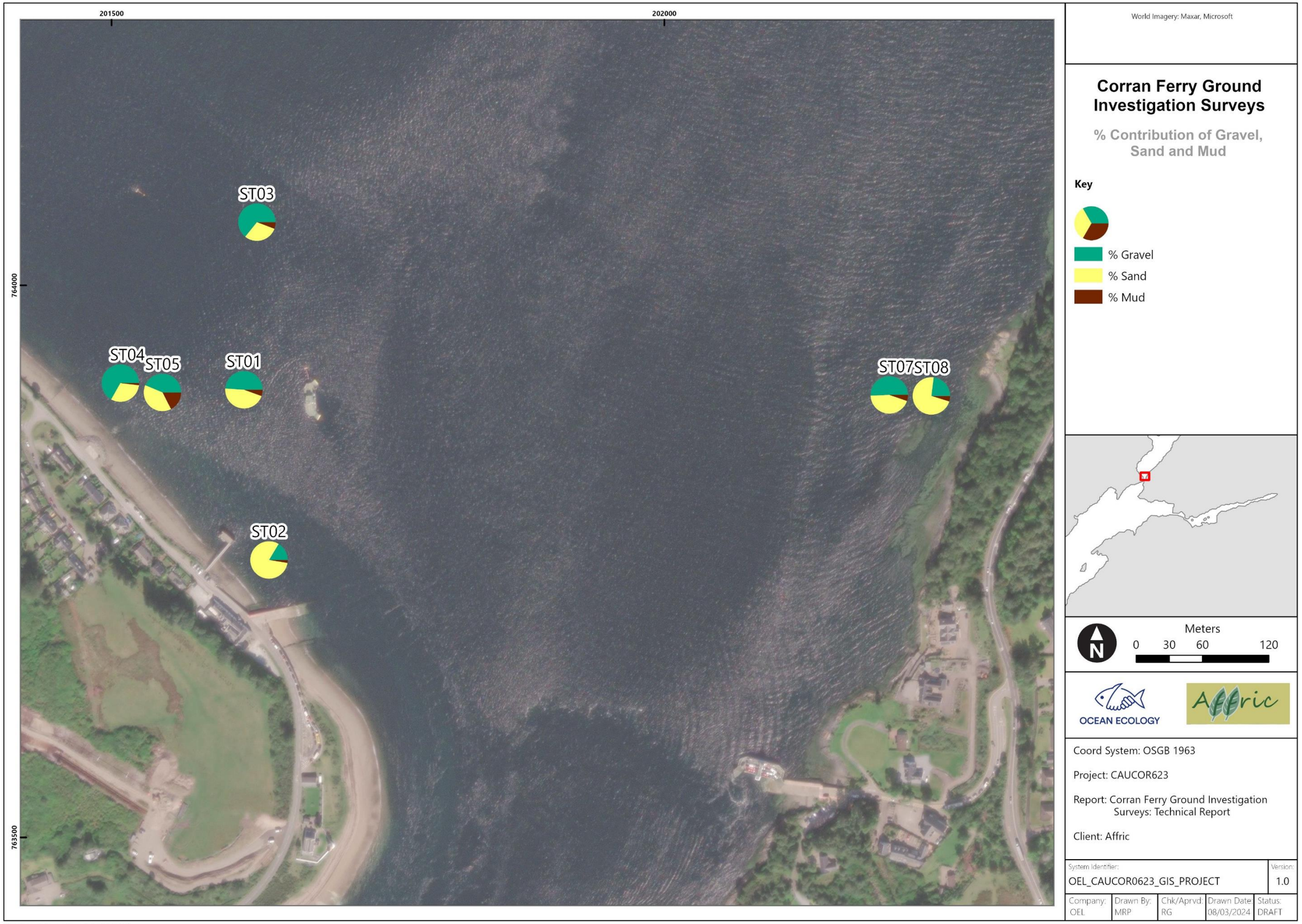

Figure 15 The principal sediment components (Gravel, Sand, Mud) as determined from PSD analysis of samples acquired during the survey.

6.5. Macrobenthic Composition

6.5.1. Univariate analysis

A diverse macrobenthic assemblage was identified across the survey area from the 7 macrobenthic samples collected across the subtidal stations (0.5 mm size fractions) including a total of 3,780 individuals and 185 taxa recorded. The mean (± SE) number of taxa per station was 27 ± 1, mean (± SE) abundance per station was 143 ± 11, and mean (± SE) biomass per station was 0.4189 ± 0.0973 gAFDW (Ash Free Dry Weight).

The full abundance matrix is provided in Appendix X. The biomass (gAFDW) of each major taxonomic group (Annelida, Crustacea, Mollusca, Echinodermata, and Miscellaneous) in each sample collected is presented in Appendix XI.

Figure 16 shows the main infaunal taxa characterising the stations. The phylum Nematoda was the most abundant accounting for 35 % of all individuals recorded. It occurred at all stations and accounted for the maximum abundance per sample and maximum average density per sample. Another key taxon was the polychaete *Pholoe inornata* occurring in 100 % of samples.

Figure 17 illustrates the relative contributions to total abundance, diversity, and biomass of the major taxonomic groups in the macrobenthic community sampled across the survey area. Miscellaneous taxa (in the main driven by high abundances of Nematoda) dominated abundance as they accounted for 38% of all individuals recorded. Biomass was dominated by Mollusca contributing to 59% of the total biomass. Annelid taxa dominated the diversity accounting for 47% of all taxa recorded.

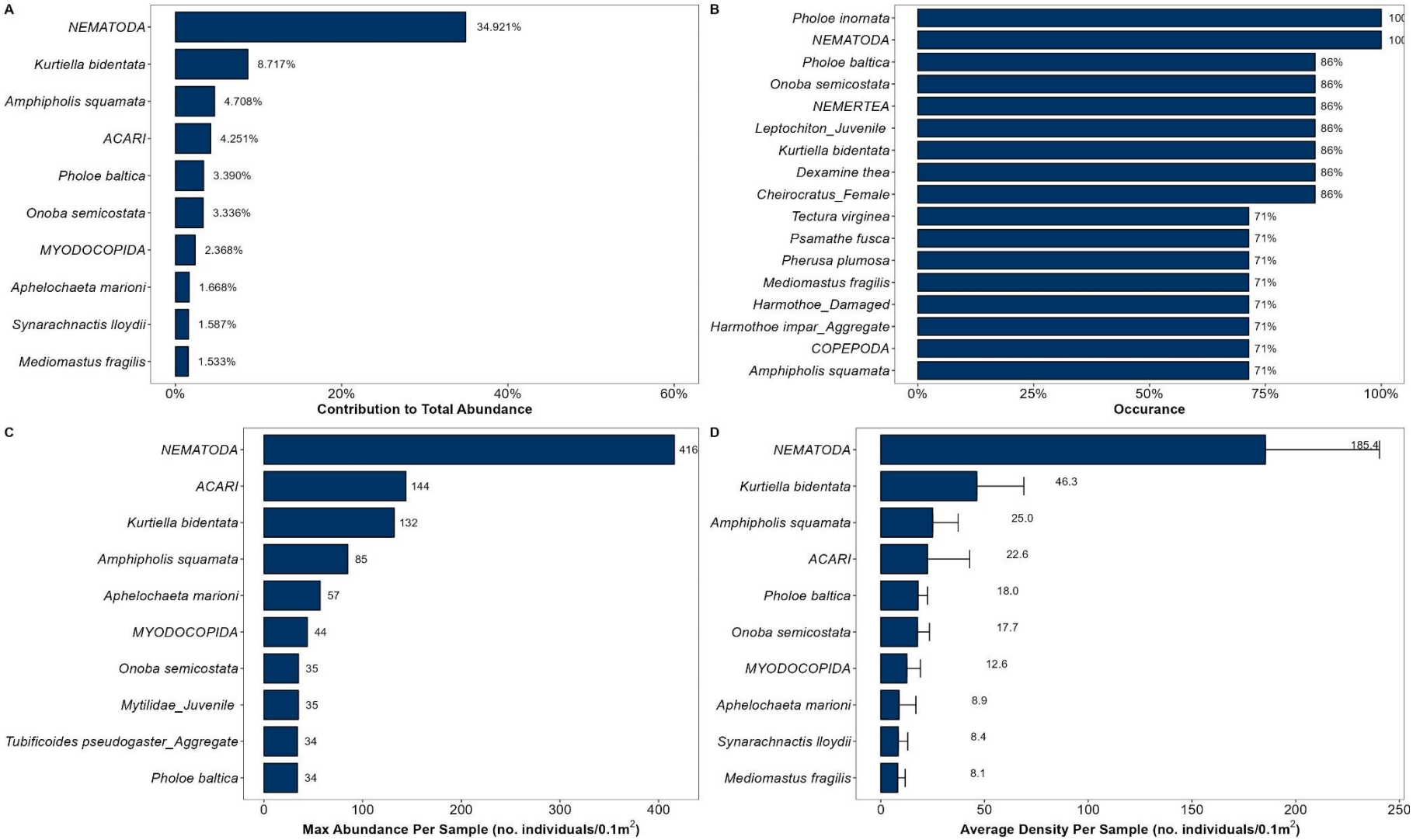

Figure 16 Percentage contributions of the top 10 taxa to total abundance (a) and occurrence (b) from samples collected across the stations. Also shown are the maximum densities of the top 10 taxa per sample (c) and average densities of the top 10 taxa per sample (d).

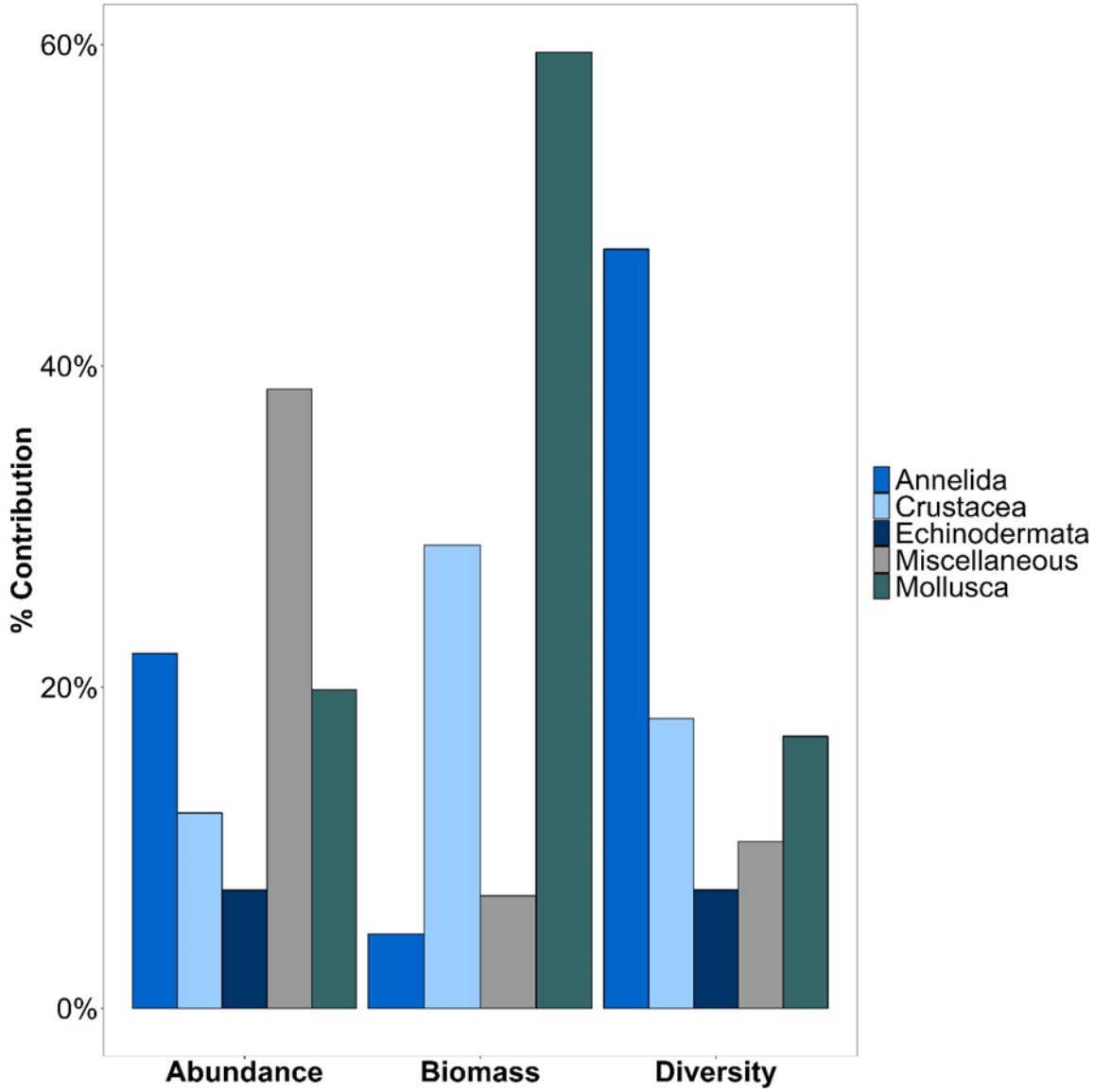

Figure 17 Relative contribution of the major taxonomic groups to the total abundance, diversity, and biomass of the taxa sampled at the survey area.

6.5.2. Notable Taxa

The mollusc *Ceratia proxima* is in the Scottish Biodiversity List of species of principal importance for biodiversity conservation. Eight individuals were recorded and were confined to a single station (ST04).

The arthropod *Crassicorophium crassicorne* and the mollusc *Mya arenaria* are classified as invasive and non-native species. *C. crassicorne* was recorded on three occasions across two stations (ST02 and ST03) and two *M. arenaria* individuals were recorded at ST03.

The Ross warm *S. spinulosa* is a protected species under the OSPAR list of threatened and/or declining species and the Habitats Directive when in reef habitat form. A single individual was recorded at Station ST07.

6.5.3. Macrobenthic Groups

Multivariate analysis was undertaken on the square-root transformed macrobenthic grab abundance data to identify spatial distribution patterns in the macrobenthic assemblages across the survey area and identify characterising taxa present.

Cluster analysis of the macrobenthic data was performed on a Bray-Curtis similarity matrix to analyse the spatial similarities in macrobenthic communities recorded across all sampled stations. The dendrogram resulting from the cluster analysis (Appendix XII) and associated Type 1 SIMPROF similarity (similarity profile routine) permutation test of all nodes within the dendrogram, identified one statistically significantly similar group ($p < 0.05$) including three stations and four outliers. The spatial distribution of this macrobenthic group and outlier stations is presented in

Figure 18.

To visualise the relationships between the sampled macrobenthic assemblages, a non-metric multi-dimensional scaling (nMDS) plot was generated on the abundance data (

Figure 18). The nMDS represents the relationships between the communities sampled, based on the distance between sample (station) points. The low stress value of the nMDS ordination plot indicates that the two-dimensional plot provides a good representation of the similarity between stations.

SIMPER (similarity percentage analysis) was used to identify the key taxa contributing to the within group similarity of the macrobenthic group recognised; the full SIMPER results are provided in Appendix XIII. Note that only three stations belonged to Macrobenthic Group A, while four stations were stand alone outliers. Of these, ST04 was the only one where the presence of red algae (*Rhodophyta, Corallinaceae*, *Phycodrys ruben)*, the sea moss *Chondrus crispus,* and brown seaweed (*Ochrophyta*) was consistently noted.

Macrobenthic Group A – Three stations belonged to this group: ST01, ST03, and ST05. These stations were characterised by the presence of Nematoda, the brittle star *Amphipholis squamata*, other brittle stars from the genus Myodocopida, the mollusc *Onoba semicostata*, the annelid *Pholoe baltica*, the mollusc *Kurtiella bidentata*, and the anemone *Synarachnactis lloydii* all together contributing to about 75% of the group average similarity of 49.42 %.

Figure 18 Two-dimensional nMDS ordination of macrobenthic communities at the subtidal stations based on square root transformed and Bray-Curtis similarity abundance data.

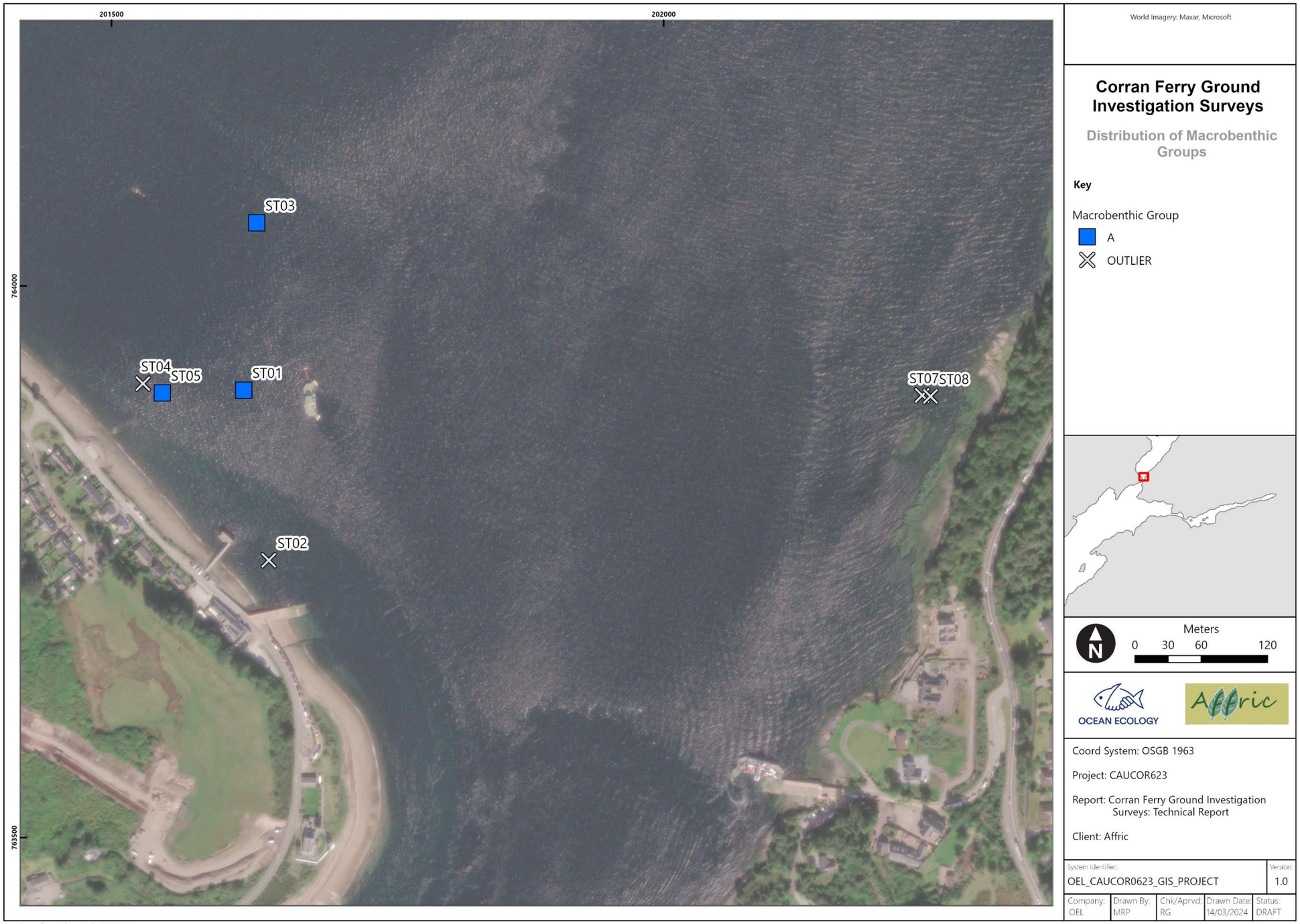

Figure 19 Spatial distribution of macrobenthic groups as determined from cluster analysis of abundance data.

6.5.4. Biotope Assignment

For the Macrobenthic Group determined using cluster analysis, biotope / habitat were assigned in line with JNCC guidance based upon their faunal and physical characteristics (Parry, 2019). Outlier stations were assigned to the most accurate EUNIS classification possible based on PSA results and seabed imagery from close by locations.

Macrobenthic Group A – One biotope aligned with the community observed within this group: A5.433 '*Venerupis senegalensis*, *Amphipholis squamata* and *Apseudes latreilli* in infralittoral mixed sediment'. This is consistent with the sediment analysis indicating that stations belonging to Macrobenthic Group A consisted of mixed sediments representative of BSH A5.4 'Sublittoral mixed sediments'. The key taxa found in this group was *Amphipholis squamata*.

Station ST02 classified as an outlier based on cluster analysis with the main difference in the community composition between this station and macrobenthic group A being a notably lower abundance of Nematoda and the absence of the brittle star *A. squamata* and the bivalve *K. bidentata*. In turn, characterising taxa at ST02 were the oligochaetes *T. pseudogaster* and *Tubificoides benedii* and amphipods of the family Corophiidae. Based on the shallow location of this station and PSA results ST02 was assigned to habitat A5.13 'Infralittoral coarse sediments'.

Station ST04 was also an outlier whose macrobenthic community differed from that of macrobenthic group A due to a higher abundance of Nematoda, Acari, *T. benedii*, the ascidian *Dendrodoa grossularia* and the sea spider *Callipallene brevirostris*. In contrast, *A. squamata* was absent in ST04. Considering that the PMF habitat 'Kelp and Seaweed Communities on Sublittoral Sediment' was observed in proximity to ST04 on cobbles, pebbles and gravel, and that PSA indicated the presence of coarse sediment, ST04 was assigned to habitat A5.13 'Infralittoral coarse sediments'.

Outlier station ST07 had a macrobenthic community that diverged from that observed in macrobenthic group A as it presented a higher abundance of Nematoda, *K. bidentata,* the sea cucumber *Leptosynapta inhaerens,* the amphipod *Dexamine thea,* the sea snail *Caecum glabrum* and the polychaete *Pseudosyllis brevipennis,* while *A. squamata* occurred in lower abundances. Considering the presence of the PMF habitat 'Kelp and Seaweed Communities on Sublittoral Sediment' in proximity to this station and the results of the PSA indicating mixed sediments, ST07 was assigned to habitat A5.43 'Infralittoral mixed sediments'.

Lastly, ST08 also categorized as an outlier and exhibited lower abundance of Nematoda, *A. squamata* and *K. bidentata* than macrobenthic group A, while it was characterised by the presence of the oligochaetes *T. pseudogaster* and *Grania* sp.. Considering that the PMF habitat 'Kelp and Seaweed Communities on Sublittoral Sediment' was observed in proximity to this

station and that PSA indicated the presence of coarse sediment, station ST08 was assigned to habitat A5.13 'Infralittoral coarse sediments'.

7. Discussion

This report presents the results and interpretation of the seabed imagery, sediment, and macrobenthic analyses with the aim to set out the environmental baseline conditions to inform the EIA process in support of upgrades to ferry infrastructure for the introduction of electric vessels on the Corran Ferry route.

7.1. Seabed Imagery

Seabed imagery was successfully captured across nine pre-determined DDC transects and four kelp transects determined in the field, resulting in the acquisition of 415 still images and 27 videos. A diverse range of habitats was identified across the survey area including rocky habitats including BSHs A3.1, A3.2, A3.3, A4.1 and A4.2, soft sediment habitats including BSHs A5.1, A5.4, and A5.5. The dominant biotope among all the observed BSHs was A5.521 '*Laminaria saccharina* and red seaweeds on infralittoral sediments' being the most frequently encountered.

EUNIS classification A5.52, A5.521, A5.5211, A5.5212, A5.5213, and A5.523 were recorded biotope components of the PMF habitat 'Kelp and Seaweed Communities on Sublittoral Sediment' recognised for its conservation significance in Scottish waters. This PMF was observed in 3 out of 4 kelp transects (K1, K2, and K3) and 6 out of 9 DDC transects (T02, T03, T04, T05, T07, and T08). Three additional PMF habitats were observed across the survey area: 'Kelp beds,' 'Low or Variable Salinity Habitats,' and 'Tide-Swept Algal Communities.' More specifically, EUNIS classifications A3.115, A3.2121, A3.214, and A3.2143 were observed on the east side of the survey area at K4, T06, T07, and T08 and were biotope components of the PMF habitat 'Kelp beds'. Biotope A3.322 was observed on the west of the survey area at T01 and represented the PMF habitat 'Low or Variable Salinity Habitats', while the following habitats and biotopes were also observed in transects on the western side of the survey area at T02 and T04 and represented the PMF habitat 'Tide-Swept Algal Communities': A3.322 and A3.126 for A3.115, A3.126, A3.2121, A3.214, A3.2143, A3.222, A3.322, A5.52, A5.521, A5.5211, A5.5212, A5.5213, and A5523.

The Annex I Reef assessment identified various reef types, including Low Stony, Low Stony and Bedrock, Bedrock, and Bedrock and Low Stony reefs. These rocky habitats have the characteristics to qualify as Annex I stony and bedrock reefs however as the survey area does not sit within the boundaries of a marine protected site, these habitats are therefore not afforded protection as such. However, they are considered important components of the biodiversity of Scottish seas and should be recorded to provide evidence for future nature conservation actions. The transects covering stony and bedrock reefs included T04, T05, T06, T07, T08, T10, K3 and K4.

Owing to dense areas of red and brown macroalgae and kelp across the survey area, numerous images could not be fully analysed as they were deemed of poor visual quality or 'zero (not analysable)' as it was impossible to see the substrate. This meant that the Annex I reef assessment could not be carried out at these locations resulting in a potential underestimation of the extent of reef features across the survey area.

7.2. Sediments

For the seven sediment samples collected during the survey, analysis confirmed the BSH A5.1 'Coarse sediment' at stations ST04, ST02, ST08 and BSH A5.4 'Mixed sediment' at ST01, ST03, ST05, ST07. Sand emerged as the most abundant textural grouping, followed by gravel. These findings align with the area's topography, especially given their proximity to the coast.

7.3. Macrobenthos

A diverse macrobenthic assemblage was identified across the survey area from the seven macrobenthic samples collected, with a total of 3,780 individuals and 185 taxa recorded. The most abundant taxon with the maximum abundance per sample, and average density per sample was Nematoda. The annelid *P. inornata* exhibited the greatest occurrence in the survey area.

Macrobenthic communities can be highly heterogenous as they are heavily influenced by ambient environmental conditions such as sediment composition (Cooper et al., 2011), hydrodynamic forces and physical disturbance (Hall, 1994), depth (Ellingsen, 2002), and salinity (Thorson, 1966). This was reflected in the macrobenthic communities observed across the survey area where three stations grouped together based on the similarity in their macrobenthic community supported by mixed sediments. A key species at these stations was *A. squamata* suggesting that the biotope present across stations ST01, ST03 and ST05 was A5.433 '*Venerupis senegalensis*, *Amphipholis squamata,* and *Apseudes latreilli* in infralittoral mixed sediment'. All other stations did not belong to a specific macrobenthic group based on their community compositions however they were all characterised by coarse sediments except for Station ST07 which was made of mixed sediments. A reason behind this could be that in the analysis of macrobenthic data, seaweed and kelp were recorded as presence/absence data and not counted. Thus, meaning that their presence was factored into diversity calculations, but not considered in abundance calculations or included in the multivariate analysis. Consequently, stations that did not belong to a specific macrobenthic group could have been stations where seaweed and kelp were predominant. Seabed imagery collected in closed proximity of grab samples ST02, ST04, ST07 and ST08 provided evidence of the PMF habitat 'Kelp and Seaweed Communities on Sublittoral Sediment' being present. Despite this some of the macrobenthic community recorded at stations ST02, ST04, ST07 and ST08 aligned with that typically found associated with kelp and seaweed communities including ascidians, gastropods and amphipods, the habitat assignment of these stations was left a level 4 rather than 5 due to the lack of consistent data pointing to a specific biotope.

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Appendix 6. Transport Assessment Scoping Report

Pell Frischmann

Corran Ferry Improvement Scheme

Scoping Report
Body Document only. Appendices can be provided on request.

108168

March 2024

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Report Ref.		**Scoping Report**				
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1 Introduction

1.1 Purpose of the Report

Pell Frischmann Ltd. (PF) has been commissioned by Wallace Stone, on behalf of The Highland Council (THC) to prepare a Transport Assessment (TA) for the proposed Corran Ferry – Infrastructure Improvement Scheme.

PF would be grateful for advice from both THC and Transport Scotland with regards to the scoping for the TA to support the planning application for the Proposed Development.

A scoping exercise for the Environmental Impact Assessment (EIA) in relation to access, traffic and transport matters will be undertaken separately to the TA scoping, with the proposed assessment methodology included within the EIA Scoping Report.

1.2 Consultation

Pre-application advice was received from THC and Transport Scotland Officers on 15 February 2023. These responses are provided in **Appendix A**.

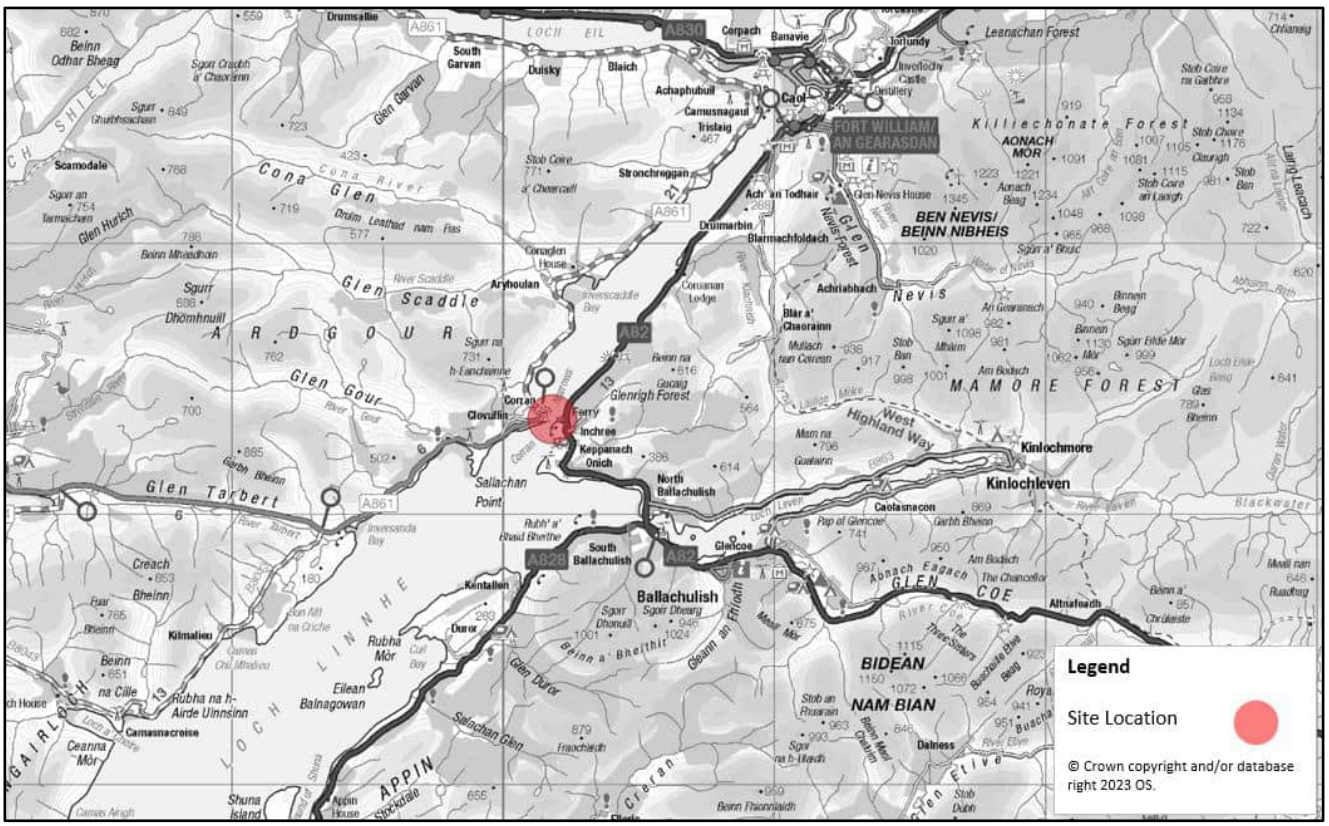
Email correspondence was undertaken in December 2023 between PF and Transport Scotland regarding appropriate surveys to measure speeds along the A82. The correspondence is provided in **Appendix B**.

1.3 Development Proposals

The Proposed Development is located at Ardgour and Nether Lochaber slipways which facilitate the existing Corran Ferry crossing.

The location of the slipways at Ardgour and Nether Lochaber associated with the Corran Ferry Service are shown in Figure 1.

Figure 1 Site Location



The project will involve replacing the existing ferries with two electric vessels and construction of new infrastructure, which includes slipways, overnight berthing structure, marshalling area, public facilities and operator offices / accommodation, as well as new affordable housing.

Five options were investigated with regards to the upgrade to Nether Lochaber and were presented as part of the pre-application discussions as Option A, B, C, D and E. Option E is being taking forward as part of the Proposed Development (see **Appendix C**).

It is anticipated that the delivery of the Proposed Development will comprise four phases, with construction activities being undertaken in Phases 1 and 2. Phases 3 and 4 are to involve the building and delivery of the two new vessels.

Phase 1 is expected to involve the construction of Ardgour slipway, the overnight berth and the demolition of the pier. It is also expected to include the construction of Nether Lochaber slipway, marshalling area and A82 junction.

Phase 2 is anticipated to comprise the refurbishment of the Ferry office, the construction of public facilities, installation of charging infrastructure, and the construction of new crew accommodation and new affordable housing. The construction of the new Ardgour marshalling area and the removal of the old Ardgour slipway would occur in Phase 2.

1.4 Report Structure

It is proposed that the structure of the TA will be as follows:

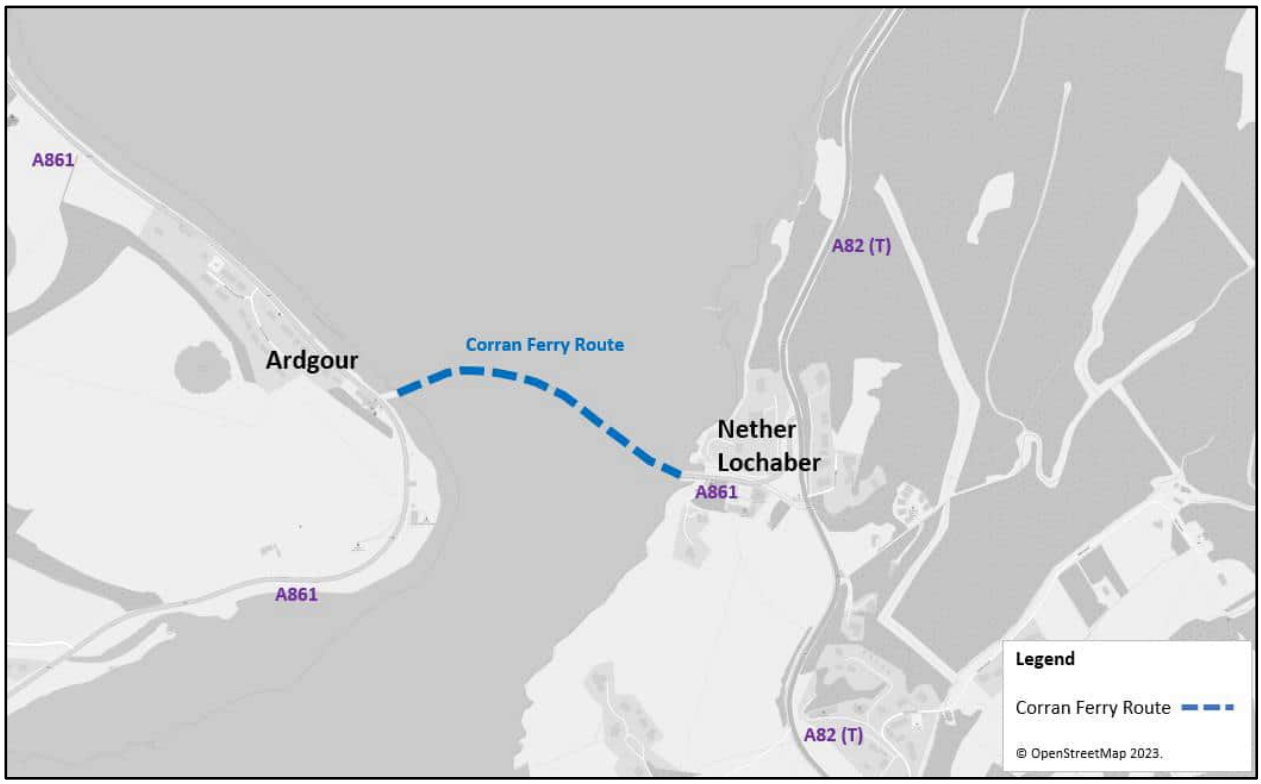
- Site Description and Current Uses;
- Transport Policy Review;
- Current Access Arrangements;
- Proposed Site Layout and Operation, including Parking Provision;
- Proposed Access Strategy;
- Multi-Modal Traffic Generation and Distribution;
- Traffic Impact Assessment, including Mitigation Measures; and
- Summary and Conclusions.

2 Site Description and Current Uses

The Proposed Development is located at Ardgour and Nether Lochaber slipways which facilitate the existing Corran Ferry crossing. The Corran Ferry is operated by THC and provides a connection between the two slipways.

The existing Corran Ferry Route location is shown in Figure 2.

Figure 2 Corran Ferry Route



2.1 Current Land Uses

At the eastern side of the Corran Ferry Route at Nether Lochaber, there are a number of existing facilities located at a building near the slipway, which include an Information Point where Ferry timetables, a bus stop and a seating area are located. Public toilet facilities are also located in this same building. There are approximately ten car parking spaces located at the Ferry car park, as well as a bicycle shelter.

At the western side of the Corran Ferry Route at Ardgour, public toilet facilities are available beside The Inn at Ardgour. There is an unmarked area to the north-west of the Ardgour slipway which appears to be used for unofficial car parking.

Designated marshalling areas are located at both Ardgour and Nether Lochaber entrances to the slipways to control the vehicles waiting to use the Ferry and aims to avoid queueing along the road network.

Corran Ferry provides a connection for foot passengers, cyclists, private and light goods vehicles (LGVs), Heavy Goods Vehicles (HGVs) and buses. Fares are dependent on the vehicle types; however, pedestrians and cyclists can travel free of charge. The Ferry usually provides a regular service seven days a week and takes approximately five minutes to cross.

3 Transport Policy Review

The following local and national policy and guidance documents will be reviewed with regard to the Proposed Development in the TA report.

- National Planning Framework 4 (2003);
- Planning Advice Note 75 (PAN75) (2005);
- Transport Assessment Guidance (2012);
- West Highland and Islands Local Development Plan (WestPlan) (2019);
- Highland-wide Local Development Plan (2012);
- Guidance on the Preparation of Transport Assessments (2014); and
- Roads and Transport Guidelines for New Developments (2013).

4 Current Access Arrangements

Within the TA, a review of site accessibility for all modes of transport will be reviewed in a hierarchical manner, which is as follows:

- Pedestrian Access;
- Cyclist Access;
- Public Transport Access; and
- Vehicular Access

This section of the TA will also provide an overview of local facilities in the area.

Details of accidents which occurred over a five-year period between 2018 and 2022 will also be provided in this section of the report. Accident information has been provided by THC Road Safety Team regarding injury collisions which have been recorded along the A82 (between 1 January 2020 and 6 April 2023) and the A861 (between 19 February 2018 and 18 March 2023). Additional accident information will be requested from Transport Scotland for five of the previously available years. Accident information for the local road network will be also obtained from the online source CrashMap.

5 Proposed Site Layout and Operation, including Parking Provision

5.1 Description of the Proposed Development

The Proposed Development will comprise the replacement of the existing Ferry with two electric vessels, which require new and upgraded infrastructure in the villages of Ardgour and Nether Lochaber. These are to comprise the key features presented in the subsequent sections.

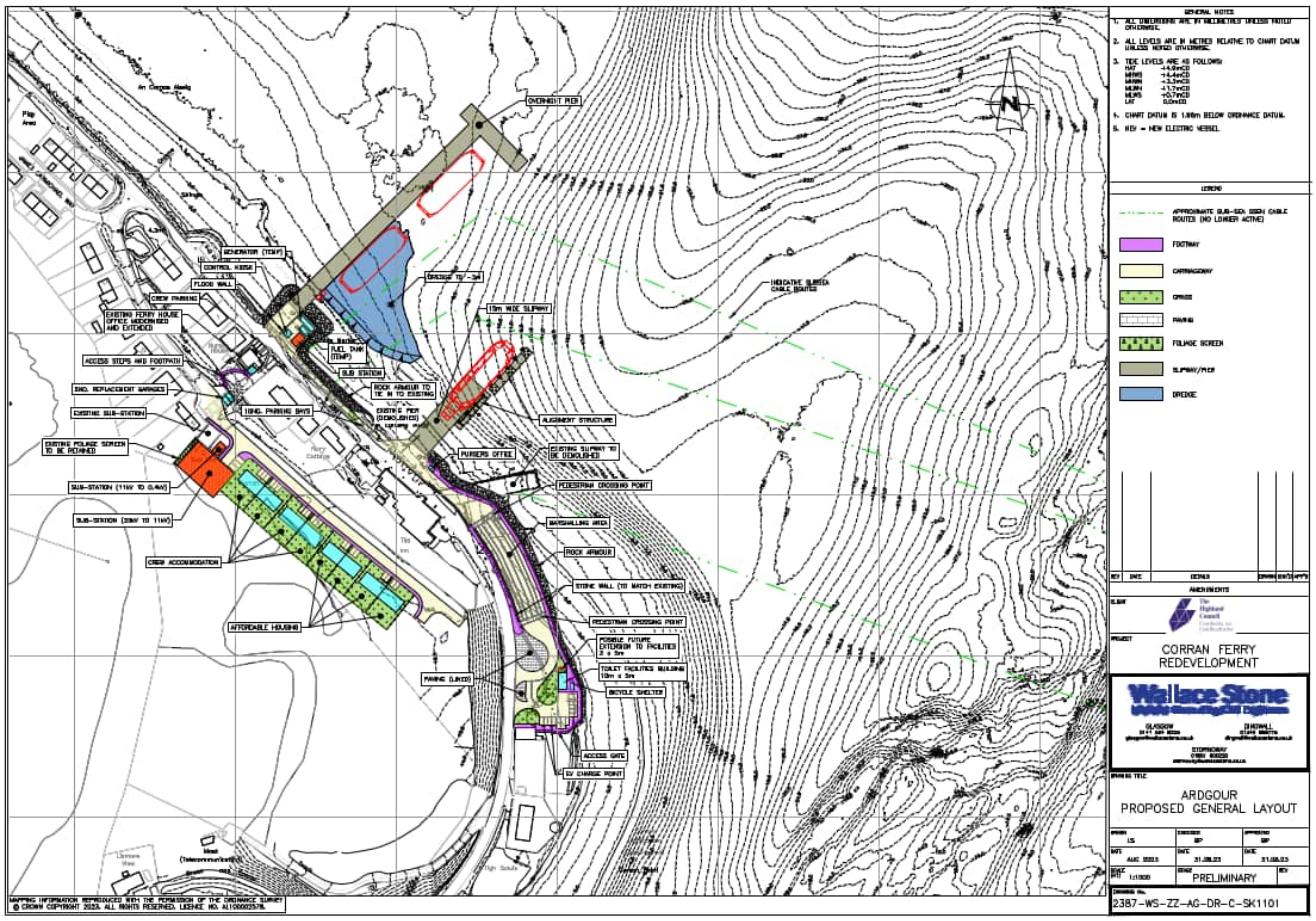
Ardgour (West) Side

The Ardgour side of the Proposed Development is to comprise:

- New Slipway with Alignment Structure;
- Overnight Berth Structure, including Vessel Charge Infrastructure;
- Increased Marshalling;
- Parking Areas, including EV Car Charging;
- Interface with the A861;
- Crew Accommodation equating to four houses;
- Four new affordable houses;
- Improvements to Ferry Offices; and
- Toilet Facility.

An indicative layout of the Ardgour side of the Proposed Development is presented in Figure 3 (and **Appendix D**).

Figure 3 Ardgour Indicative Layout

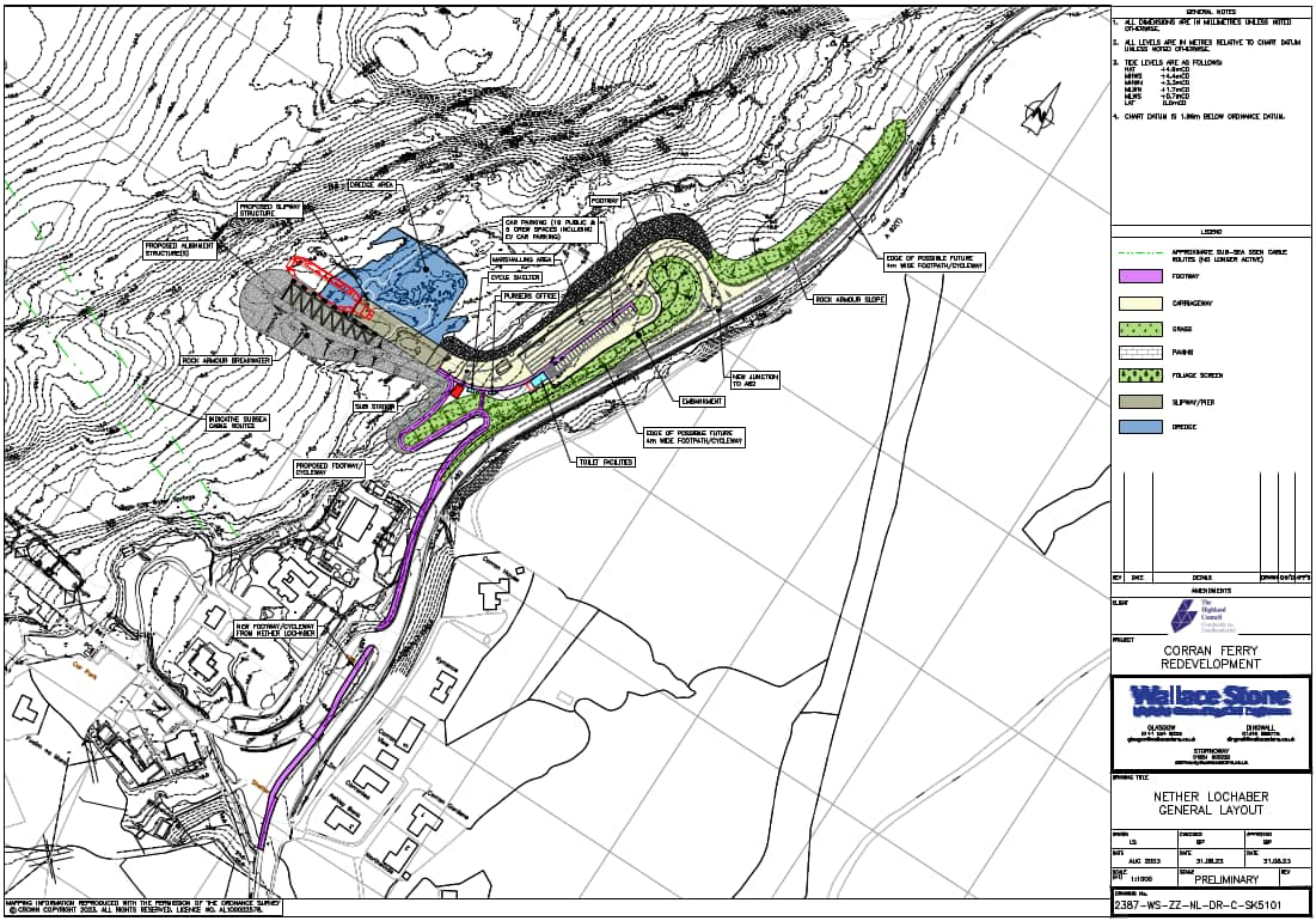


Nether Lochaber (East) Side

- New Slipway and Alignment Structure;
- New Marshalling Area;
- Parking Areas, including EV Car Charging;
- New Junction with the A82; and
- Toilet Facility.

An indicative layout of the Nether Lochaber side of the Proposed Development is presented in Figure 4 (and **Appendix C**).

Figure 4 Nether Lochaber Indicative Layout



5.2 Operation, including Parking Provision

The TA will outline details of the proposed operation of the Proposed Development, including details on the Ferry services.

Proposed parking provision and details on the proposed marshalling areas will also be described in the TA. Disabled parking will be provided in accordance with Table 6.11 of The Highland Council's Roads and Transport Guidelines for New Developments (May 2013).

6 Proposed Access Strategy

6.1 Vehicular Site Access

Ardgour (West) Side

It is proposed that vehicles wishing to access the Ferry from the upgraded Ardgour slipway, will join the upgraded marshalling area which will be accessed via the A861. To the south of the marshalling area, car parking facilities will be provided.

Vehicles exiting from the Ferry will use the upgraded slipway which will form a priority junction to the A861, in a similar form as is currently used. Appropriate drawings, including visibility splay drawings, will be provided in the TA. Swept path analysis drawings will be included to demonstrate that the layouts are appropriate and that vehicles can manoeuvre efficiently within the site.

Nether Lochaber (East) Side

A new access, in the form of a priority junction, leading to the new slipway will be constructed to the north of the existing slipway access from the A82. The new access junction will lead to the proposed marshalling area, and a separate parking area. Vehicles wishing to access the Ferry will be directed through signage to join the marshalling area before accessing the proposed slipway to enter the Ferry.

Vehicles exiting from the Ferry will do so by the proposed slipway and will follow the exit lane towards the new priority junction with the A82. Vehicles exiting the parking area will do so in a similar manner. Appropriate drawings, including visibility splay drawings, will be provided in the TA. Swept path analysis drawings will be included to demonstrate that the layouts are appropriate and that vehicles can manoeuvre efficiently within the site.

6.2 Pedestrian and Cycle Access

Ardgour (West) Side

Footways will be provided which will lead to the upgraded slipway. Pedestrian crossing points will be provided at the marshalling area to promote safer crossing. A cycle parking shelter will be provided as part of the proposals.

Nether Lochaber (East) Side

A new footway / cycle way will be provided, which will connect the new slipway to the existing bus stop along the A82, to the south. A cycle parking shelter will be provided as part of the proposals.

6.3 Public Transport Access

The TA will outline details of proposed public transport access to the Proposed Development.

6.4 Internal Road Layout

Details regarding the circulation and movements associated with the Proposed Development will be provided within the TA.

7 Multi-Modal Traffic Generation and Distribution

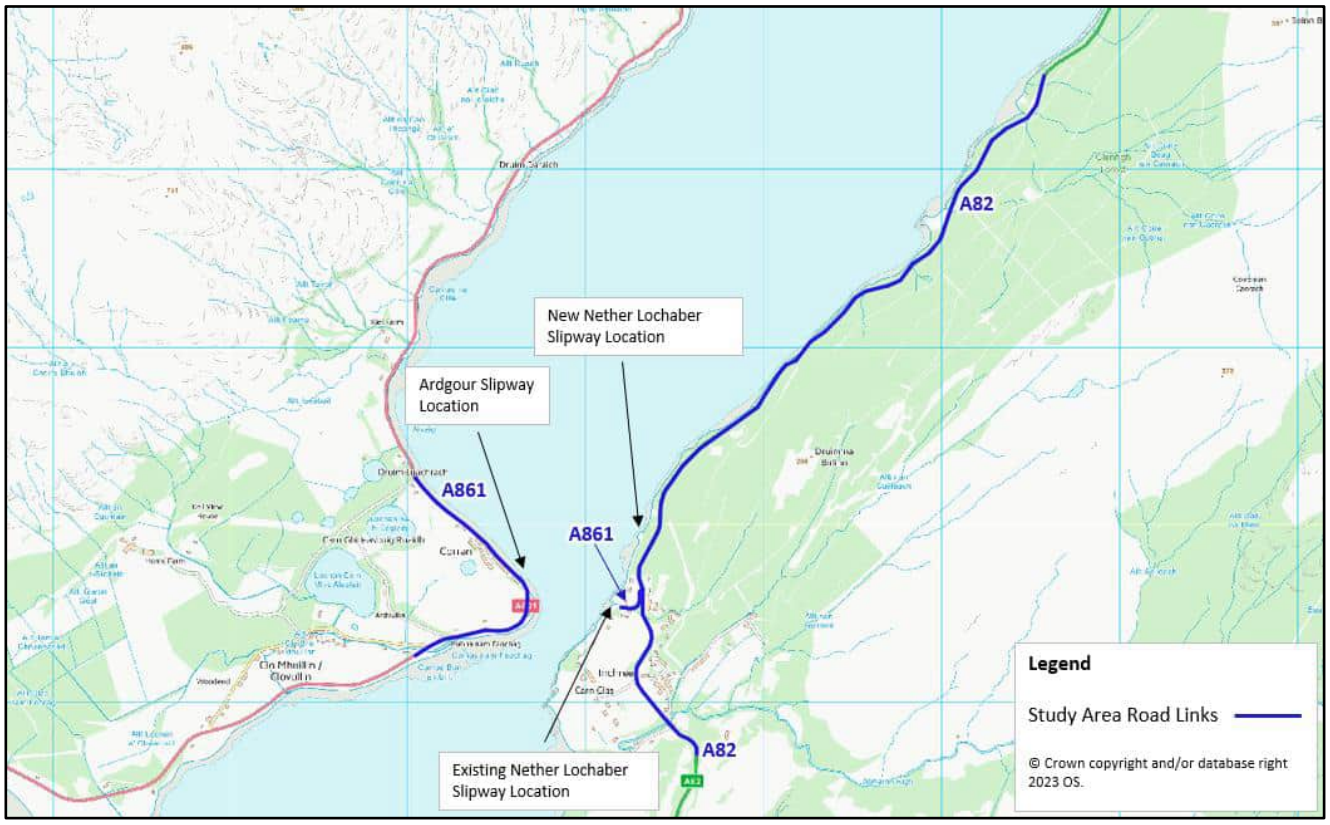
7.1 Study Area

It is proposed that the study area for the TA will comprise the following road links:

- A82, between Keppanach and Corrychurrachan;
- A861, between A82 and Ferry Terminal; and
- A861, between Clovullin and Ardgour Parish Church.

The extent of the study area is shown in Figure 5 below.

Figure 5 Study Area Road Links



7.2 Traffic Data

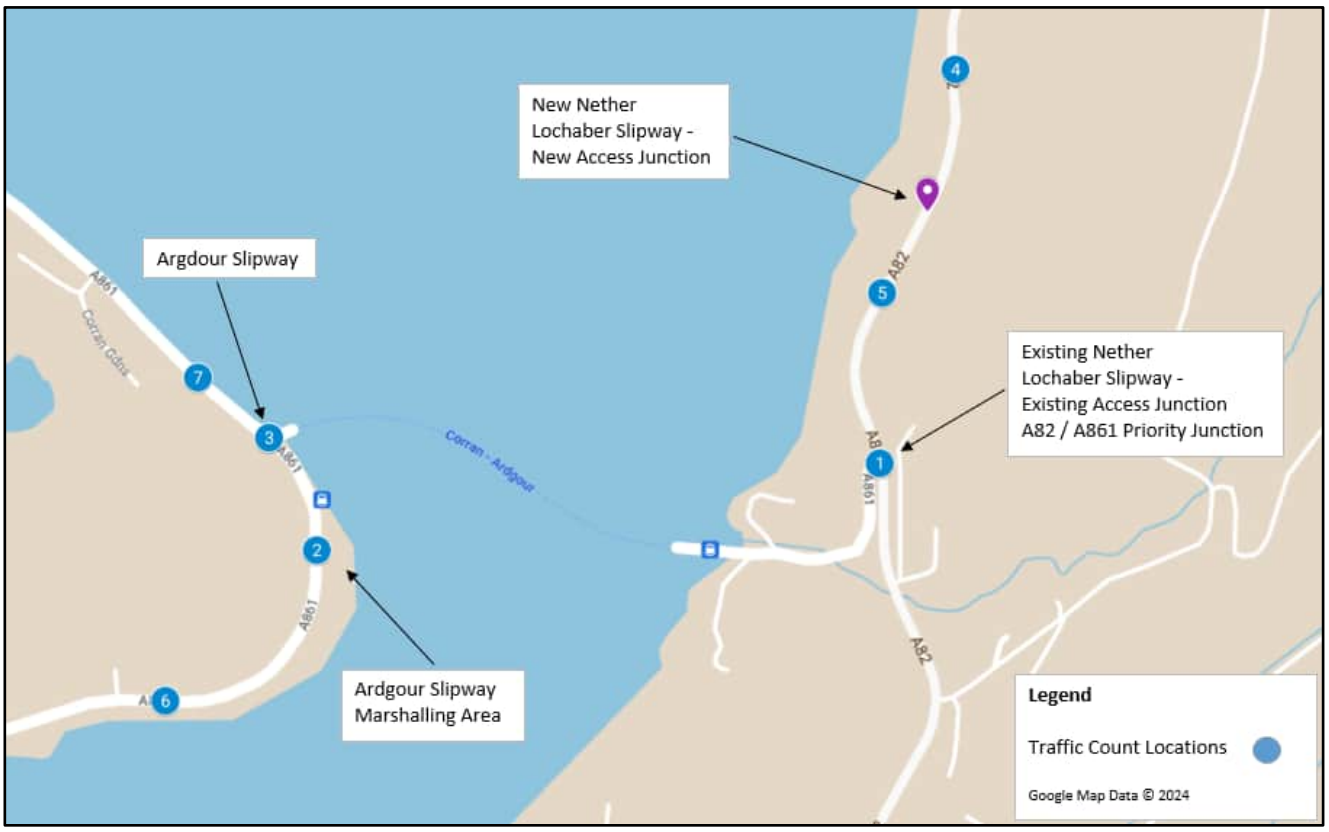
It is proposed that traffic surveys will be undertaken to establish baseline traffic conditions on the local and trunk road network and to determine the distribution of vehicles using the Ferry. The surveys will comprise Turning Count surveys and Automatic Traffic Count (ATC) surveys which are to be undertaken during the second week of the Easter holidays, as holiday movements traditionally capture tourist traffic in the area.

The proposed traffic surveys are detailed as follows and can be seen in Figure 6. :

1. A82 / A861 priority junction - A turning count survey (a weekday survey from 05:30 am to 22:30 pm);
2. A861 / Ardgour Ferry Terminal access to marshalling area - A turning count survey (a weekday survey from 05:30 am to 22:30 pm);
3. A861 / Ardgour Ferry Terminal slipway junction - A turning count survey (a weekday survey from 05:30 am to 22:30 pm);
4. A82 north of proposed new access junction to the improved Nether Lochaber Slipway – A seven-day ATC survey over 24 hours to obtain traffic volume data and speed data;

5. A82 south of proposed new access junction to the improved Nether Lochaber Slipway – A seven-day ATC survey over 24 hours to obtain traffic volume data and speed data;
6. A861 south of Ardgour Slipway – A seven-day ATC survey over 24 hours to obtain traffic volume data and speed data; and
7. A861 north of Ardgour Slipway – A seven-day ATC survey over 24 hours to obtain traffic volume data and speed data.

Figure 6 Proposed Traffic Count Locations



7.3 Trip Generation

Construction Trips

The trip generation during the construction phases will be estimated from first principles and based on the volume and tonnage of construction materials. This will then be converted to two-way vehicle movements and allocated to the appropriate section of the construction programme. Note it is not proposed to undertake assessment of the construction phase of the Proposed Development within the TA, this would be included within the Access, Traffic and Transport Chapter of the EIA Report.

Operational Trips

With regards to the traffic impact assessment on local highway links within the study area, it is proposed that information received from THC will be used to estimate the increase in annual operational trips. For the year 2019, THC estimated that there were a total of 315,500 PCU carryings per year (**Appendix E**). A Marshalling Area Capacity Review which was undertaken by Wallace Stone on behalf of THC and is based on traffic information from Friday 27 August and Saturday 28 August 2021, which was the Summer Bank Holiday weekend (England, Wales and Northern Ireland). A copy of the document is presented in **Appendix F.** Within the document, it is noted that THC has estimated that the annual growth of vehicles using the Ferry will be 2.1% per annum. It is proposed that this annual growth percentage above will be applied to this estimation in order to forecast future year carryings to be used in the impact assessments.

The proposals include the provision of eight houses (four for crew accommodation and four as new affordable housing). Is it considered that trips associated with the housing provision will have a negligible impact on the

transport network included in the study area, and Ferry crossing, and it is therefore proposed that trips associated with this element of the Proposed Development will be scoped out of the operational assessment.

For the junction capacity assessment to be undertaken on the newly provided junction along the A82, it is proposed that the operational trips will be estimated from the traffic movements observed at A82 / A861 priority junction (**Figure 6**, Location 1) during the turning count surveys and appropriate growth factors will be applied to estimate future year trips.

7.4 Trip Distribution

Construction Trips

The trip distribution of construction trips will be based on the locations of material suppliers and will be detailed within the TA, which will be used to inform the Access, Traffic and Transport Chapter of the EIA Report.

Operational Trips

It is proposed that the operational trip distribution will be based on the observed ratio of movements calculated from turning count surveys.

7.5 Parking Accumulation

A capacity assessment on the existing marshalling areas has been undertaken as part of the Marshalling Area Capacity Review prepared by Wallace Stone, which has been approved by THC (**Appendix F**). This review has been used to inform the design and masterplan of the Proposed Development. It is therefore not considered necessary to undertake a parking accumulation assessment, however, it is proposed that a summary of the document will be provided in the TA.

8 Traffic Impact Assessment, including Mitigation Measures

8.1 Assessment Year

The Proposed Development will be delivered in a total of four phases. An indicative Construction Programme will be provided within the TA. Construction traffic trips will be plotted on the indicative Construction Programme to illustrate the peak journeys on the network for Phase 1 and 2.

It is estimated that construction will begin on Phase 1 in 2025 and that it will be operational in 2027, and construction will begin on Phase 2 in 2027 and it will be operational in 2028. Any changes in the projection of the Proposed Development prior to submission will be reflected in the TA.

8.2 Traffic Growth

It is proposed that low National Road Traffic Forecast (NRTF) growth factors would be used to appropriately factor the baseline flows to future year flows.

As previously noted, the future years of the Proposed Development trips will be subject to the projected to the estimated annual growth of vehicles using the Ferry which is estimated to be 2.1% per annum.

8.3 General Approach

Construction Phase

It is proposed that an impact assessment will be undertaken of the peak construction months in Phase 1 and Phase 2.

Operational Phase

The estimated traffic generation of the Proposed Development will be compared with baseline traffic flows, obtained from existing traffic survey data, in order to determine the percentage traffic increase during the operation of Phase 1 and Phase 2 on links within the study area.

Committed development traffic, i.e. those from proposals with planning consent, will be included in baseline traffic flows, where traffic data for these schemes is considered significant and is publicly available. Developments that are proposed or at scoping would not be included.

The newly provided priority junction on the A82 would be assessed using Junctions 10, in terms of Ratio of Flow to Capacity (RFC) and maximum queues (PCUs). Only the highest RFC values recorded during the modelled period would be presented.

8.4 Mitigation measures

Suitable mitigation measures would be proposed should the impact of the Proposed Development cause an unacceptable impact on the Study Area.

A framework Construction Traffic Management Plan (CTMP) will be included as a proposed mitigation measure.

9 Key Questions

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining bodies:

- Do the Consultees agree with the proposed method of assessment?
- Are the Consultees aware of any significant traffic generating developments that have planning approval that should be included as committed development?
- Are the proposed traffic surveys acceptable, both in scope and timings proposed?
- Are the Consultees satisfied with the proposed trip generation and distribution?
- Are the use of Low National Road Traffic Forecasts (NRTF) is acceptable for the whole of the study?

Corran Ferry Infrastructure Improvement Scheme

Appendix C.2: Scoping Opinion – The Highland Council

The Highland Council
Comhairle na Gàidhealtachd

Wallace Stone
Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

Claire Williams
Affric Limited

Please ask for: Susan Macmillan
E-mail: Susan.macmillan@highland.gov.uk
Our Ref: 24/02104/SCOP
Date: 05 August 2024

Dear Ms Williams

THC PLANNING REFERENCE: 24/02104/SCOP
DEVELOPMENT: CORRAN FERRY INFRASTRUCTURE IMPROVEMENT SCHEME
LOCATION: CORRAN FERRY, FORT WILLIAM

Thank you for requesting an Environmental Impact Assessment (EIA) Scoping Response for the above project and I apologise for the delaying in responding.

This letter constitutes The Highland Council's (THC) Scoping Response in relation to the development as described above and supplements advice previously given to the applicant in the Pre-Application Advice Pack 22/04570//PREMAJ issued on 15th February 2023.

That response should be considered alongside this Scoping Response to help inform the content of the forthcoming EIAR. This Scoping Response remains valid for 12 months. Should a planning application not be forthcoming within this period it is advised that you obtain an updated response.

We trust that this helps inform the scope of the EIAR and is helpful to the applicant when formalising any forthcoming application.

SCOPING RESPONSE

Applicant:	**The Highland Council**
Project:	**CORRAN FERRY INFRASTRUCTURE IMPROVEMENT SCHEME - THE SCHEME WILL INVOLVE THE CONSTRUCTION OF NEW INFRASTRUCTURE IN THE VILLAGE OF ARDGOUR, AND JUST NORTH OF THE 'CORRAN' SETTLEMENT IN THE REGION OF NETHER LOCHABER, TO FACILITATE THE INTRODUCTION OF A NEW ELECTRIC VESSEL (NEV) FOR THE FERRY SERVICE AND IMPROVE FACILITIES FOR USERS AND OPERATORS OF THE CORRAN FERRY. THE DEVELOPMENT WILL INVOLVE BOTH MARINE CONSTRUCTION AND DREDGING WORKS BELOW MEAN HIGH WATER SPRINGS (MHWS), AS WELL AS CONSTRUCTION WORKS ABOVE MEAN LOW WATER SPRINGS (MLWS). SUBSEQUENTLY, THE WORKS WILL BE SUBJECT TO LICENSING UNDER THE MARINE (SCOTLAND) ACT 2010 AND PLANNING PERMISSION UNDER THE TOWN AND COUNTRY PLANNING (SCOTLAND) ACT 1997 (AS AMENDED).**
Project Address:	**CORRAN FERRY, FORT WILLIAM**
Our Reference:	**24/02104/SCOP**

This response is given without prejudice to the Planning Authority's right to request additional information in connection with any statement, whether Environmental Impact Assessment Report (EIAR) or not, submitted in support of any future application. These views are also given without prejudice to the future consideration of, and decision on, any planning application received by The Highland Council (THC).

THC request that any EIAR submitted in support of an application for the above development take the comments highlighted below into account; many of which are already acknowledged within the Scoping Report. In particular, the elements of this report as highlighted in parts 3, 4, and 5 should be presented as three distinct elements.

Consultation responses received to date have already been made available to you. Should any further responses be received, these will be forwarded on in due course.

1.0 Description of the Development

1.1 The description of development for the EIAR must include:

- a description of the physical characteristics of the whole development and the full land use requirements during the operational and construction phases;
- a description of the main characteristics of the construction processes, for instance, nature and quantity of the materials used;
- the risk of accidents, having regard in particular to substances or technologies used;
- an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, heat, radiation, etc.) resulting from the operation of the development; and
- the estimated cumulative impact of the project with other consented or operational developments.
- A detailed schedule of mitigation

2.0 Alternatives

2.1 A statement is required which outlines the main development alternatives studied by the applicant and an indication of the main reasons for the final project choice. This is expected to highlight the following:

- the range of technologies that may have been considered;
- locational criteria and economic parameters used in site selection;
- options for access; including construction laydown areas and staff / contractors' accommodation compounds;
- design and locational options for all elements of the proposed development, and
- the environmental effects of the different options examined.

The issues highlighted in Section 2.5 of the Scoping report should be included in detail.

3.0 Environmental Elements Affected

3.1 The EIAR must provide a description of the aspects of the environment likely to be significantly affected by the development. The following paragraphs highlight some principal considerations. The EIAR should fully utilise this understanding to ensure that information provided is relevant and robustly grounded.

3.2 The following topics are discussed in the Scoping Report and the Planning Authority agree that these are the principal considerations in respect of the EIA.

Land Use and Policy

3.3 The EIAR should recognise the existing land uses affected by the development having particular regard for THC's Development Plan inclusive of all statutorily adopted Supplementary Guidance (SG) and other Planning Advice Notes. The purpose of this chapter is to highlight relevant policies not to assess the compatibility of the proposal with policy. This will be in addition to the outline in Section 4.2 of the Scoping Report to identify relevant policies in individual topic sections.

3.4 **The Development Plan comprises the:**

- National Planning Framework 4 (NPF4) adopted in 2023
- Highland-wide Local Development Plan (HwLDP) adopted in 2012
- West Highland and Islands Local Development Plan (WestPlan) adopted in 2019
- Associated Supplementary Guidance

A list of the relevant polices was included in the PREAPP response.

3.5 Applicants are advised to monitor the annual Development Plans Newsletter as this provides a timetable of work on the Highland development plan. The March 2024 Development Plans Newsletter is now available on the Council's website. https://www.highland.gov.uk/downloads/file/18842/development_plans_newsletter_2024

3.6 Developer Contribution, Community Benefit & Community Wealth Building will all need to be considered as the scheme develops. With Developer Contributions sought in compliance with NPF4 Policy 18 (Infrastructure first), HwLDP Policy 31 (Developer Contributions) and Developer Contributions Supplementary Guidance (2018).

3.7 The Council's Sustainable Design Guide Supplementary Guidance provides advice and guidance on a range of sustainability topics, including design, building materials and minimising environmental impacts of development. A Sustainable Design Statement would be required to support a future application.

Chapter 5: Cumulative Impact

3.8 At this stage Chapter 5 sets out the methodology for considering cumulative impact as part of the EIAR. The approach is considered appropriate.

Chapter 6: In-Air Noise and Vibration

3.9 It is noted that development plan policy relating to noise and disturbance have not been incorporated into Section 6.1 (e.g. NPF Policy 23 and Highland-wide LDP Policy 72)

3.10 Based on the information set out in Chapter 6 of the Scoping Report it is agreed that the elements set out in Section 6.6 of are **scoped in** to the Noise Impact Assessment and included in the EIAR.

3.11 Section 6.6 of the Scoping Report proposes to scope out the Blasting Noise and Vibration.

3.12 NatureScot has advised they note the possibility of some onshore rock blasting stated in section 6.3 however the decision has been reached to scope this out (section 6.6) on the basis that it will be managed via communication with residents. This assumes that onshore rock blasting will only affect humans depending on the scale/location of blasting. However, it has the potential to affect other receptors (birds, otters, marine mammals etc.). We would therefore advise including onshore rock blasting at this stage. Further discussion is required on this topic before agreement could be provided to scope out this topic.

Chapter 7: Underwater Noise

3.13 Based on the information set out in Chapter 7, and in accordance with the mitigation identified, it is agreed that the elements set out in Section 7.5 underwater noise can be **scoped out** in relation to Planning interests as set out in table 7.5.1. Please however see Sections below relating to Chapter 14.

Chapter 8: Air Quality

3.14 Based on the information set out in Chapter 8 of the Scoping Report it is agreed that the elements set out in Section 8.6 are **scoped in.**

Chapter 9: Geology, Land and Soils

3.15 The Contaminated Land officer requested further information on fuelling arrangements and noted the following (consultation response).

3.16 "Hydrocarbon contamination of soils and groundwater may be present due to leaks or spills from fuelling infrastructure, and site investigation may be necessary in areas of current/former fuel storage to determine the ground conditions. Any areas of contamination found during site investigation would then necessitate remedial action to ensure protection of human health and the environment. The applicant shall provide information on how redundant infrastructure is to be removed or reused, and proposals for active reuse of redundant land to avoid creation of vacant/derelict land.

3.17 Following the response received, the agent provided the following commentary -

3.18 *"Refuelling of the vessel has always occurred on the vessel deck. This is undertaken by a fuel tanker lorry which travels to site every week and refuels the vessel while on the ferry. Subsequently, there are no areas of current/former fuel storage.*

3.19 *We acknowledge in the scoping supporting documentation that 'the use of hydrocarbons in the form of heating oil, fuels and lubricants of vehicles, could give rise to small scale sources of contamination, but no evidence of this has been found' (Scoping Report, Section 9.2.4). The small scale of such sources, if found, means the project will not cause significant environmental effects to land or soils.*

3.20 *During construction there will be Environmental Clerk of Work (ECoW) support, hence in the unlikely event of potential contamination, associated works would be temporarily halted to allow appropriate management to be put in place."*

3.21 Based on the information set out in Chapter 9, and in accordance with the mitigation identified, it is agreed that the topic of geology, land and soils can be **scoped out**, however further supporting information may be required to satisfy the issue of potential land contamination.

Chapter 10: Water Quality

3.22 Based on the information set out in Chapter 10, and in accordance with the mitigation identified, it is agreed that the topic of water quality can be **scoped out** in relation to planning interests as set out in table 10.7.1.

Chapter 11: Seabed, Coastal Processes and Flooding

3.23 Based on the information set out in Chapter 11 of the Scoping Report it is agreed that the elements set out in Section 11.5 of are **scoped in** (table 11.5.1).

3.24 NatureScot has commented as follows: "Section 11 of the Scoping Report (p60) acknowledges that changes to the seabed and/or to coastal processes could have knock-on effects on marine biodiversity. It is important to also acknowledge that there are no physical process receptors. This means that EIA assessment under this topic should consider only the impact Magnitude (the impact pathway) which can then be combined with Sensitivity in the Marine Biodiversity chapter of the EIA to produce a conclusion regarding impact significance.

3.25 We agree with the scoping in and out proposed in Table 11.5.1. For the potential operational-phase effects of changes to coastal processes, we are content with the modelling method proposed to support the assessment. However, the modelling should be complemented by expert geomorphological assessment. In particular, there is clear evidence on aerial imagery that coastal sediment transport is predominantly north-eastwards i.e. 'up-loch', so the likelihood of sediment being 'dammed' against the SW side of the new slipways and breakwater should be used as a 'sense check' of the modelling results.

3.26 SEPA advice previously given is reiterated – "As this location is upstream of the narrows, we would use the levels derived within the Caol and Lochyside Flood Study (as opposed

to the CFB level which we are concerned underestimates the flood risk in this area due to observed levels in this area). The agreed coastal still water level is 4.69mAOD and the climate change (CC) allowance for the area is 0.86m so any new built development (which is not classed as essential infrastructure or water compatible use) should be on land above 5.55mAOD. We also recommend a 0.6m allowance for freeboard, and this would be a requirement for any development which is to be used for overnight accommodation, so on land above 6.15mAOD, or as a minimum using this for finished floor level (FFL)."

Chapter 12: Biodiversity

3.27 It is noted that the requirements for biodiversity enhancement associated with the project will be considered as part of a Biodiversity Net Gain (BNG) Assessment for the project development area. The BNG Assessment will be utilised during the EIA process to determine the significance of impacts associated with habitat loss

3.28 It is also noted that a HRA Supporting Document will be submitted to prove sufficient information to allow the competent authority to undertake a Habitat Regulations Appraisal

3.29 Biodiversity is therefore **scoped in.**

Chapter 13: Terrestrial Ecology and Ornithology

3.30 Based on the information set out in Chapter 13 of the Scoping Report, and in accordance with the mitigation identified, it is agreed that the elements set out in Section 13.4 are **scoped in** (table 13.4.1).

3.31 NatureScot advises as follows – "The scoping document identifies possible connectivity between the proposal and Ardgour & Moidart Special Protection Area (SPA) and Glen Etive & Glen Fyne SPA. This is due to the presence of potential golden eagle foraging habitat within 1 km of the proposal site which is also within foraging range of the boundary of the SPA.

3.32 Having checked the Golden Eagle Territory model, we can confirm there is predicted high usage areas of habitat within 1 km of the proposal. However, these areas are separated from the SPA by areas of unsuitable habitat.

3.33 The territory centres of active SPA eagle territories are also at least 5 km from the proposal site. In addition, the main area of predicted eagle use is within 3 km of an active wider countryside golden eagle territory centre of the east of the proposal, meaning its use by SPA birds is unlikely. We therefore agree that the impacts on the SPAs are scoped in but an assessment is likely to conclude no adverse impact on site integrity.

3.34 Information on and/or a survey to determine winter roost sites for golden eagles in the wider countryside territory to the east would allow mitigation to be put in place if birds are roosting on the western edge of that territory within 1 km of the proposal site.

3.35 The scoping document also identifies potential connectivity to the Ben Nevis Site of Special Scientific Interest (SSSI) due to the presence of wintering snow buntings. Most of our wintering population of approx. 13,000 snow buntings breed in Greenland and Iceland with only 60-80 pairs breeding in the UK. It is likely that the wintering birds on the site are from the larger Greenland/Iceland population rather than being the local Ben Nevis SSSI birds. Suitable wintering habitat is also unlikely to be a limiting factor for wintering snow bunting as they can be very nomadic in response to weather and food availability. Habitat loss or disturbance is therefore unlikely to be significant even if some or all of the birds are from the Ben Nevis breeding population. We can therefore advise that connectivity and an adverse impact on the SSSI population of snow buntings is highly unlikely."

Chapter 14: Marine Ecology

3.36 As above, it is noted that a HRA Supporting Document will be submitted to prove sufficient information to allow the competent authority to undertake a Habitat Regulations Appraisal

3.37 NatureScot has provided the following comments:

3.38 "Protected Areas - The proposal is not within any Special Protected Areas (SPAs), Special Areas of Conservation (SACs) or Marine protected areas (MPAs). The CFIISR (pages 73 – 83) reviews designated areas within 25 km of the proposal. We are content with the evaluation from a marine ecology perspective. The CFIISR has identified connectivity to the following qualifying features of SACs:

- Eileanan Agus Sgeiran Lios Mór SAC (with regard to harbour seal)
- Inner Hebrides and the Minches SAC (with regard to harbour porpoise)

3.39 Priority Marine Features (PMFs) - The proposal outlines that seagrass beds are within 1 km to the northwest of the proposal. The full extent of these seagrass beds has yet to be determined and NatureScot are aware of ongoing discussions regarding the seagrass beds at Ardgour and a potential community led restoration project. Seagrass beds have a high sensitivity to changes in siltation rate, this includes either light continuous sedimentation or a single deposition event (>5 cm) and a high sensitivity to changes in water clarity (FeAST). The impact of dredging resulting in resuspension of sediment and siltation could impact on the protected features. However, the project has scoped out the impact of the development on the seagrass beds due to size of the footprint (<0.52 km) and the distance to the beds (>500 m). The justification for scoping out the impact to seagrass should be supported by further information on the distance/survey evidence from seagrass communities and the distance from sites of dredging and if there is a risk of interactions; modelling of the potential sedimentation from the development and on-going works (dredging). We therefore request further information on the justification/evidence for scoping out the impacts to seagrass communities identified in the EIA scoping report.

3.40 The other PMFs identified (Kelp Beds, Kelp and Seaweed Communities on Sublittoral Sediment, Low or Variable Salinity Habitats and 'Tide-Swept Algal Communities') could be

impacted by the development both directly (habitat change, removal, sedimentation) as well as indirectly by the introduction of marine Invasive Non-Native Species (INNS). The impact of the proposed development will be included in the EIA. The key area of impact appears to be on the eastern slipway development where Kelp Beds and Kelp and Seaweed Communities on Sublittoral Sediment PMFS have been identified in the benthic surveys.

3.41 Annex I Reef Habitat - There is some overlap with the developed-on Annex I reef habitat on the eastern slipway. The developer has mapped/modelled the areas within the footprint where annex I reef will be located. The proposal will result in some damage to the Annex I feature within the footprint of the proposal. However, it is likely that the development will be colonised to some extent.

3.42 Marine Mammals - We note in section 14.2 that 4 species (porpoise, bottlenose dolphin, common dolphin and minke whale) have been highlighted to be considered further and are content with this.

3.43 We agree that rock stripping and blasting along with piling are scoped in. We disagree that dredging should be scoped out. This activity does cause noise that can disturb marine mammals and thus needs to be considered further. We note the intention to scope out vessel movements. Although we appreciate that the operational phase of the proposal will be largely the same, for the construction phase it is important that all potential impacts are included and information to support assessment produced. We would therefore advise that vessel movements is scoped in. This should include any underwater noise relating to removal of existing structures such as cutting and anything associated with rock dumping for the new breakwater

3.44 We note the plan to include underwater noise and dredge disposal for the construction phase but scope out vessel and construction activity interaction. However, compliance with SMWWC is suggested in the report. We agree that vessel strikes are a low probability in this location and suggest that this could be covered in the Marine Mammal Protection Plan for completeness. Injury due to disposal at sea has been scoped out during the operations phase despite it having been scoped in for construction and the same risk having been highlighted in the accompanying text for maintenance dredging. We would therefore advise that this is scoped in for both construction and operation."

3.45 Based on the information set out in Chapter 14 of the Scoping Report, and in accordance with the mitigation identified, it is agreed that the elements set out in Section 14.1.5 and 14.2.6 are **scoped in** and expanded to take in dredging and vessel movements as per NatureScot advice above.

Chapter 15: Materials and Waste

3.46 Based on the information set out in Chapter 15, and in accordance with the mitigation identified, it is agreed that the elements in relation to Planning interests as set out in table 15.6.1 are **scoped in.**

Chapter 16: Landscape and Visual

3.47 Based on the information set out in Chapter 16, and in accordance with the mitigation identified, it is agreed that the elements in Section 16.5 are **scoped in (**table 16.5.2).

3.48 An additional viewpoint location recommended on the A861, further north than Viewpoint 5 at Rubha Deargh. It is a similar distance from the developments as Viewpoint 1, but with the Narrows more directly in the line of view for people travelling south. The location is within the Ardgour SLA at a point where uninterrupted views down the loch first open up.

3.49 It is noted that Policy 4 of NPF4 is not included in the policy section.

Chapter 17: Archaeology and Cultural Heritage

3.50 Based on the information set out in Chapter 17, and in accordance with the mitigation identified, it is agreed that the elements in Section 17.5 are **scoped in** (table 17.5.1).

3.51 The Council's archaeologist advises they are satisfied that the information presented in the scoping report will adequately address an impact assessment for this proposal. The methodology as set out in the Scoping Report Section 17 is acceptable and will allow an assessment of the predicted impacts to be made. The scoped out effects presented in Table 17.5.1 are reasonable.

3.52 It is noted that Policy 7 of NPF4 is not included in the policy section.

Chapter 18: Traffic, Transport and Access

3.53 Based on the information set out in Chapter 18, and in accordance with the mitigation identified, it is agreed that the elements as set out in Section 18.5 are **scoped in** (table 18.5.1).

3.54 The Council's Transport Planning Team have made the following comments:

3.55 "We note the intention to use the following rules as triggers for requiring further consideration of the environmental implications from traffic associated with the construction and operation of the new ferry facility:

- Rule 1: Road links where traffic flows or HGV's increase by more than 30%.
- Rule 2: Road links of high sensitivity where traffic flows or HGV's increase by more than 10%.

3.56 To be clear, we would expect any sections of single-track public road with passing places to be deemed as high sensitivity and adhering with the requirements of Rule 2 above. This reflects how sensitive such routes are to changes in traffic flows and vehicle make-ups.

3.57 The proposed Transport Assessment (TA) will need to demonstrate how the proposals adequately cater for bus priority and bus stop connectivity. We note that Highland Council Public Transport Team made comment during the Major Pre Application process on the importance of the designs for the new Nether Lochaber facility adequately catering for buses being able to bypass the traffic queues for the ferry. The proposals submitted in support of this submission don't appear to cater for that.

3.58 They also made comment that new bus stops may be required on the A82(T) in the vicinity of the relocated ferry terminal. Any submission will need to demonstrate the adequacy of walking connectivity between serviced bus stops and the new Nether Lochaber ferry terminal.

3.59 The submission appears to be suggesting that 1No. disabled car parking space will be provided at the car park serving the relocated Nether Lochaber facility. For the quantum of parking spaces proposed, this would require at least 2No. disabled parking spaces. Also, at least 1 of those spaces should be served by suitable electric vehicle (EV) charging facilities.

3.60 With regards to EV charging, it appears that Building (Scotland) Regulations require at least 50% of all car parking spaces incorporate suitable enabling infrastructure for the future installation of EV charging equipment. If so, any submission will need to demonstrate adherence with such requirements.

3.61 Similarly, the proposed TA and supporting layouts will need to clarify what facilities will be provided at the relocated Ardgour terminal to aid pedestrians and cyclists boarding and alighting the ferry service and justify their adequacy from a road safety and accessibility perspective."

3.62 In addition to the comments from Transport Planning, it is highlighted that the area proposed for construction compound on the Ardgour side has previously been found to have inadequate visibility onto the A861.

3.63 It is noted that Policy 13 of NPF4 is not included in the policy section.

Chapter 19: Navigation

3.64 Based on the information set out in Chapter 19, and in accordance with the mitigation identified, it is agreed that the elements, in relation to Planning interests, set out in table 19.5.1 are **scoped in.**

Chapter 20: Population and Socioeconomics

3.65 Based on the information set out in Chapter 20, and in accordance with the mitigation identified, it is agreed that the elements as set out in Section 20.5 are **scoped in** (table 20.5).

3.66 It is noted that Policy 25 of NPF4 is not included in the policy section.

Chapter 21: Human Health

3.67 Based on the information set out in Chapter 21, and in accordance with the mitigation identified, it is agreed that the elements as set out in Section 21.5 are **scoped out** (table 21.5.1).

Chapter 22: Climate Change

3.68 Based on the information set out in Chapter 22, and in accordance with the mitigation identified, it is agreed that the elements as set out in Section 22.5 are **scoped in** (table 22.5.1).

3.69 It is noted that Policy 28 of the Highland wide LDP is not included in the policy section.

Chapter 23: Major Accidents and Disasters

3.70 Based on the information set out in Chapter 23, and in accordance with the mitigation identified, it is agreed that the elements as set out in Section 23.4 are **scoped out** (table 23.4.1).

Additional chapter - Forestry and Woodland

3.71 The Council's Forestry Officer has provided comments on the proposal and recommended a separate chapter on forestry – NPF Policy 6, Highland-wide LDP policies 51 and 52.

3.72 There are no significant trees or woodlands within the scoping area on the Ardgour side. On the Nether Lochaber side, there is a satellite site to the south which appears to be a construction/ storage compound with a periphery of mixed broadleaf trees around the south and east sides, either side of the gated entrance. The main site on the east side is proposed within existing mixed broadleaf woodland (mainly alder, birch and ash). It is listed in the Native Woodland Survey of Scotland as pole-stage (fairly young) wet woodland of very high nativeness and semi naturalness

3.73 The applicant will need to provide a Forestry Chapter to the EIAR by a suitable consultant and the chapter will identify the location, type and condition of all woodland on and around the sites. The EIAR should provide a baseline survey of the trees and plants (including fungi, lichens and bryophytes) present on the site to determine the presence of any rare or threatened species.

3.74 The applicant should design the layout to minimise the impact on woodland as much as possible, especially native broadleaf woodland and woodland listed on the Ancient Woodland Inventory AWI. Where that is not fully possible the applicant will need to provide robust justification for the need to develop a wooded site.

3.75 The EIA Report should include Tree Constraints Plans and Tree Protection Plans to BS 5837:2012 to show how retained trees/woodland would be safeguarded from construction activity as well as a tree/woodland removal drawing which shows the extent of woodland that would need to be removed to accommodate new development.

3.76 The applicant will also need to provide a Landscape Plan and Landscape Maintenance Plan which shows how trees to be removed are to be replaced with on-site planting and to show how the visual amenity of the local landscape is to be enriched.

3.77 Where woodland is proposed to be removed, compliance with the Scottish Governments Control of Woodland Removal policy must be demonstrated. Compensatory planting of new woodland is a clear expectation where there are any proposals for felling, and if necessary, this would need to be off-site.

4.0 Significant Effects on the Environment

4.1 Leading from the assessment of the environmental elements the EIAR needs to describe the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from:

- the existence of the development;
- the use of natural resources; and
- the emission of pollutants, the creation of nuisances and the elimination of waste.

4.2 The potential significant effects of development must have regard to:

- the extent of the impact (geographical area and size of the affected population);
- the trans-frontier nature of the impact;
- the magnitude and complexity of the impact;
- the probability of the impact; and
- the duration, frequency and reversibility of the impact.

4.3 The effects of development upon baseline data should be provided in clear summary points.

4.4 The Council requests that when measuring the positive and negative effects of the development a four point scale is used advising any effect to be either strong positive, positive, negative or strong negative.

4.5 The applicant should provide a description of the forecasting methods used to assess the effects on the environment.

5.0 Mitigation

5.1 Consideration of the significance of any adverse impacts of a development will of course be balanced against the projected benefits of the proposal. Valid concerns can be overcome or minimised by mitigation by design, approach or the offer of additional features, both on and off site. A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment must be set out within the EIAR statement and be followed through within the application for development.

5.2 The mitigation being tabled in respect of a single development proposal can be manifold. Consequently, the EIAR should present a clear summary table of all mitigation measures associated with the development proposal. This table should be entitled draft Schedule of Mitigation. As the development progresses to procurement and then implementation this carries forward to a requirement for a Construction Environmental Management Document (CEMD) and then Plan (CEMP) which in turn will set the framework for individual Construction Method Statements (CMS). Further guidance can be obtained at:

https://www.highland.gov.uk/downloads/file/2644/construction_environmental_management_process_for_large_scale_projects

This process is currently under review by a working party led by SEPA working through Heads of Planning Scotland but for the time being remains relevant.

5.3 The implementation of mitigation can often involve a number of parties other than the developer. In particular local liaison groups involving the local community are often deployed to assist with phasing of construction works – abnormal load deliveries, construction works to the road network, borrow pit blasting. It should be made clear within the EIAR or supporting information accompanying a planning application exactly which groups are being involved in such liaison, the remit of the group and the management and resourcing of the required effort.

If you would like to discuss this scoping response, please contact the undersigned.

Susan Macmillan

Planning Team Leader - Lochaber

Corran Ferry Infrastructure Improvement Scheme

Appendix C.3: Scoping Opinion - Marine Directorate Licensing Operations Team

Wallace Stone
Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

Marine Directorate - Licensing Operations Team Scoping Opinion

Scoping Opinion adopted by the Scottish Ministers under Part 4 of The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017

The Highland Council

Corran Ferry Infrastructure Improvement Scheme

December 2024

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1. Introduction

1.1 Background

1.1.1 On 14 May 2024, the Scottish Ministers received a scoping report ("the Scoping Report") from The Highland Council ("the Applicant") as part of its request for a scoping opinion relating to Corran Ferry Infrastructure Improvement ("the Proposed Works"). In accordance with regulation 14 of The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) ("the 2017 MW Regulations") the Scottish Ministers considered the content of the Scoping Report to be sufficient.

1.1.2 This scoping opinion is adopted by the Scottish Ministers under the 2017 MW Regulations ("the Scoping Opinion") in response to the Applicant's request and should be read in conjunction with the Scoping Report. The matters contained in the Scoping Report have been carefully considered by the Scottish Ministers and use has been made of professional judgment, based on expert advice from stakeholders and Marine Directorate in-house expertise and experience. This Scoping Opinion identifies the scope of impacts to be addressed and the method of assessment to be used in the Environmental Impact Assessment Report ("EIA Report") for the Proposed Works.

1.1.3 The Scottish Ministers, in adopting this Scoping Opinion, have, in accordance with the 2017 MW Regulations, taken into account the information provided by the Applicant, in particular, information in respect of the specific characteristics of the Proposed Works, including its location and technical capacity and its likely impact on the environment. In addition, the Scottish Ministers have taken into account the representations made to them in response to the scoping consultation they have undertaken.

1.1.4 In examining the EIA Report, and any other environmental information, the Scottish Ministers will seek to reach an up-to-date reasoned conclusion on the significant effects on the environment from the Proposed Works. This reasoned conclusion will be considered as up to date if the Scottish Ministers are satisfied that current knowledge and methods of assessment have been taken account of. For the avoidance of doubt, this Scoping Opinion does not preclude the Scottish Ministers from requiring the Applicant to submit additional information in connection with any EIA Report submitted with applications for construction and dredging under the Marine (Scotland) Act 2010 ("the 2010 Act"). In the event that the Applicant does not submit applications for marine licences under the 2010 Act for the Proposed Works within 12 months of the date of this Scoping Opinion, the Scottish Ministers

strongly recommend that the Applicant seeks further advice from them regarding the validity of the Scoping Opinion.

2. The Proposed Works

2.1 Introduction

2.1.1 This section provides a summary of the description of the Proposed Works provided by the Applicant in the Scoping Report together with the Scottish Ministers' general comments in response. The details of the Proposed Works in the Scoping Report have not been verified by the Scottish Ministers and are assumed to be accurate.

2.2 Description of the Proposed Works

2.2.1 The purpose of the Proposed Works is to provide new infrastructure to support the introduction of a larger new electric vessel ("NEV") to increase the resilience of the Corran Ferry service. The Corran Ferry service carries passengers and vehicles a distance of approximately 420 metres ("m") across the Corran Narrows, the narrowest section of Loch Linnhe, between the settlements at Ardgour on the west shore and Corran on the east shore in the west of Scotland. The Proposed Works will involve both construction and dredging works below Mean High Water Springs ("MHWS")

2.2.2 The Proposed Works are required to support the neighbouring communities with life line services such as access to hospitals, further education, employment opportunities and for the maintenance of reliable supply chain needs. The ferry route operates 361 days of the year carrying over 270000 cars each year currently utilising one of two compatible, though ageing vessels. The MV Maid of Glencoul is operating beyond its original design life and the MV Corran has a remaining life expectancy of around 10 years.

2.2.3 The Corran Narrows is a ferry service crossing Loch Linnhe in Lochaber and acts as a gateway to the peninsula and the Western Isles. The Proposed Works comprise the construction of new ferry service infrastructure on either side of the Corran Narrows. The aim is to replace the current ferry terminals to facilitate the use of the proposed new ferry service. The Proposed Works will involve both construction and dredging works below Mean High Water Springs ("MHWS").

2.2.4 On the west side of Loch Linnhe, new infrastructure will be required: a new slipway, an overnight berthing structure, localised road improvements, formalised residential parking, footpaths, vessel charging facilities, a marshalling lane and a temporary diesel generator with associated fuel storage (for the construction phase). The slipway will be of gradient 1:8 and constructed of concrete on infilled steel sheet piled foundations. The overnight berthing structure is of a T-shape design 100m by 50m, and will consist of a concrete deck supported by infilled steel sheet piles.

2.2.5 The footings for both the slipway and the marshalling lane extension will both require land reclamation. The berthing structure will require a small area of land reclamation and will be strengthened using rock armour. The new parking area will require land reclamation from the intertidal area and rock armour installed.

2.2.6 Demolition of the existing 40m x 15m pier will be required to make space for vessels using the new infrastructure. The means of demolition of the pier will be by steel cutting and concrete breaking.

2.2.7 Sections of the existing sub-sea cabling will be removed from the footprint of the Proposed Works and the terminals cut, capped and anchored to the seabed below dredge depth. On the east side of Loch Linnhe the new infrastructure required includes: a new slipway, a breakwater with vessel alignment structure, a new marshalling area and access road, a new junction onto the existing A82, public car parking, a toilet block, new paths, a bicycle shelter, EV vehicle charging units and a pursers kiosk. The slipway will be 1:8 gradient and constructed from infilled precast concrete and in-situ pours. The breakwater and alignment structure will be fitted with a steel framework and fendering to the south and west face.

2.2.8 Construction of the marshalling area will require the levelling of existing land and land reclamation from the adjacent foreshore. This reclaimed land will be installed with rock armour on the seaward face. Both sides of the loch will require associated services, such as lighting, power, water and drainage.

2.2.9 The development will require dredging works to create sufficient water depths at the overnight berthing structure and slipway on the Nether Lochaber side and the breakwater toe. Techniques may include backhoe, mechanical excavation, ripping and plough dredging on either side of the narrows.
A backhoe dredge technique is likely to be the primary technique utilised at Ardgour.
A bund mounted excavator/ripper supported by land based plant is the most likely technique anticipated for dredging on the Nether Lochaber side.
Where characteristics are suitable, dredge spoil will be preferentially utilised within the scheme development, as infill or as rock armoured protection. Any alternative disposal or reuse of dredge spoil will be informed by a Best Practicable Environmental Option (“BPEO”)

2.2.10 The expected development time for completion of the project is 18 months, from mid-2025 to late 2026.

2.3 Onshore/Planning/Harbour Revision Order

2.3.1 The Scottish Ministers are aware the Applicant has sought a separate scoping opinion from The Highland Council for the associated onshore works. It is essential that the EIA Report concerning onshore works will be available at the time that the EIA Report for the Proposed Works is being considered so that all the information relating to the project as a 'whole' is presented. The EIA Report for the Proposed Works must consider the cumulative impacts with the onshore works.

2.3.2 The Scottish Ministers advise that the EIA Report must explicitly detail the licensable marine activities to be carried out below MHWS as part of the Proposed Works and identify which activities overlap with The Highland Council remit.

2.4 The Scottish Ministers' Comments

Description of the Proposed Works

2.4.1 The Proposed works will require dredging of the seabed around the infrastructure to ensure sufficient water depth for unrestricted access in all tidal conditions. The Scottish ministers note that the Scoping Report does not detail the volume of dredge material or the consideration of a sea disposal site. The Applicant should consider the location of the dredge spoil disposal site and provide detailed sample plans for the dredge amount and area. The Scottish Ministers advise that consideration of the site disposal area and volume of the dredge material and dredge methodology should be included in the EIA report.

2.4.2 The Scottish Ministers note that the Applicant proposes to use dredge material as infill in the land reclamation and potentially as rock armour. Any material unsuited to these purposes is proposed to be deposited below MHWS. The Scottish Ministers advise that a worst case scenario must be assessed whereby all dredged material requires to be deposited at sea (subject to no contamination issues being found and a suitable deposit site being identified) and all of the infill material requires to be sourced from an alternative location and transported to site. The Applicant has indicated that a Best Practicable Environmental Option ("BPEO") will accompany any proposal to deposit dredged material at sea and this must clearly detail all

options that have been considered and that any transport requirements have been assessed.

Design Envelope

2.4.3 The Scottish Ministers note the Applicant's intention to apply a 'Design Envelope' approach. Where the details of the Proposed Works cannot be defined precisely, the Applicant should ensure that they identify all licensable marine activities to be carried out below MHWS and apply a worst-case scenario for both construction and operations.

2.4.4 The Scottish Ministers advise that the Applicant must make every attempt to narrow the range of options. Where flexibility in the design envelope is required, this must be defined within the EIA Report and the reasons for requiring such flexibility clearly stated. At the time of application, the parameters of the Proposed Works should not be so wide-ranging as to represent effectively different projects. To address any uncertainty, the EIA Report must consider the potential impacts associated with each of the different scenarios. The criteria for selecting the worst case and the most likely scenario, together with the potential impacts arising from these, must also be described. The parameters of the Proposed Works must be clearly and consistently defined in the applications for the marine licence*s* and the accompanying EIA Report.

2.4.5 The Scottish Ministers will determine the applications based on the worst-case scenario. The EIA Report will reduce the degree of design flexibility required and the detail may be further refined in a Construction Method Statement ("CMS") to be submitted to the Scottish Ministers, for their approval, before works commence. Please note however, the information provided in Section 7 below regarding multi-stage regulatory approval. The CMS will 'freeze' the design of the project and will be reviewed by the Scottish Ministers to ensure that the worst-case scenario described in the EIA Report is not exceeded.

2.4.6 It is a matter for the Applicant, in preparing the EIA Report, to consider whether it is possible to robustly assess a range of impacts resulting from a large number of undecided parameters. If the Proposed Works or any associated activities materially change prior to the submission of the EIA Report, the Applicant may wish to consider requesting a new Scoping Opinion.

Alternatives

2.4.7 The EIA Regulations require that the EIA Report include 'a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the Applicant, which are relevant to the Proposed Works and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects'. The Scottish Ministers acknowledge section 2.5 of the Applicant's Scoping Report setting out the consideration of alternatives to date together with the planned activities that are proposed to inform the EIA Report further. A feasibility study was commissioned for a fixed-link crossing, but the concluded credible funding option was to improve on the existing ferry service, and as such the Scoping Report considers alternative locations for the crossing. These alternatives are referred to as the northern, central and southern crossings. There is no intention to rule out a fixed-link crossing in the future.

2.4.8 For the avoidance of doubt, the Scottish Ministers advise that the EIA Report must include an up-to-date consideration of the reasonable alternatives studied as the parameters of the Proposed Works have been refined. The Scottish Ministers expect this to comprise a discrete section in the EIA Report that provides details of the reasonable alternatives studied across all aspects of the Proposed Works and the reasoning for the selection of the chosen option(s), including a comparison of the environmental effects.

3. Contents of the EIA Report

3.1 Introduction

3.1.1 This section provides the Scottish Ministers' general comments on the approach and content of information to be provided in the Applicant's EIA Report, separate to the comments on the specific receptor topics discussed in section 2.4 of this Scoping Opinion.

3.2 EIA Scope

3.2.1 Matters are not scoped out unless specifically addressed and justified by the Applicant and confirmed as being scoped out by the Scottish Ministers. The matters scoped out should be documented and an appropriate justification noted in the EIA report.

3.3 Mitigation and Monitoring

3.3.1 Any embedded mitigation relied upon for the purposes of the assessment should be clearly and accurately explained in detail within the EIA Report. The likely efficacy of the mitigation proposed should be explained with reference to residual effects. The EIA Report must identify and describe any proposed monitoring of significant adverse effects and how the results of such monitoring would be utilised to inform any necessary remedial actions.

3.3.2 The EIA Report should clearly demonstrate how the Applicant has had regard to the mitigation hierarchy, including giving consideration to the avoidance of key receptors. The Scottish Ministers advise that where the mitigation is envisaged to form part of a management or mitigation plan, the EIA Report must set out these plans or the reliance on these in sufficient detail so the significance of the residual effect can be assessed and evaluated. This should also include identification of any monitoring and remedial actions (if relevant) in the event that predicted residual effects differ to actual monitored outcomes. Commitment to develop plans without sufficient detail is not considered to be suitable mitigation in itself.

3.3.3 The EIA Report must include a table of mitigation which corresponds with the mitigation identified and discussed within the various chapters of the EIA Report and accounts for the representations and advice attached in Appendix I.

3.3.4 Where potential impact on the environment has been fully investigated but found to be of little or no significance, it is sufficient to validate that part of the assessment by detailing in the EIA Report, the work that has been

undertaken, the results, what impact, if any, has been identified and why it is not significant.

4. Consultation

4.1 The Consultation Process

Following receipt of the Scoping Report, the Scottish Ministers, in accordance with the 2017 MW Regulations, initiated a 30 day consultation process, which commenced on 29 May 2024. The following bodies were consulted, those marked in bold provided a response and those marked in italics sent nil returns or made no comment.

- **NatureScot**
- **RYA**
- **Transport Scotland ("TS")**
- **Marine Analytical Unit ("MAU")**
- **Marine Directorate – Science, Evidence Data and Digital ("MD_SEDD")**
- *Argyll and Bute Council*
- *SEPA*
- **Scottish Water**
- **MCA**
- **RSPB**
- **HES**
- *The Highland Council*
- *Northern Lighthouse Board*
- *Crown Estate*
- *Chamber of Shipping*
- *Inshore Fisheries Groups*
- *Whale and Dolphin Trust*
- *Health and Safety Executive*
- *Ports and Harbours*
- *Scottish Wildlife Trust*
- *Visit Scotland*
- *Scottish Southern Energy (SSE)*
- *MOWI*
- *Scottish Sea Farms*
- *Ministry of Defence*
- *BT*
- *Salmon Board*
- *Fishery Office Oban*
- *Lochaber Community Council*

4.2 Responses received

4.2.1 From the list above a total of 9 responses were received. The purpose of the consultation was to seek representations to aid the Scottish Ministers' consideration of which potential effects should be scoped in or out of the EIA Report.

4.2.2 The Scottish Ministers are satisfied that the requirements for consultation have been met in accordance with the 2017 MW Regulations. The sections below highlight issues which are of particular importance with regards to the EIA Report and any marine licence applications. The representations and advice received are attached in Appendix I and each must be read in full for detailed requirements from individual consultees.

5. Interests to be considered within the EIA Report

5.1 Introduction

5.1.1 This section contains the Scottish Ministers' opinion on whether the impacts identified in the Scoping Report are scoped in or out of the EIA Report. The Scottish Ministers advise that the representations from consultees and advice from MAU, MD-SEDD and TS must be considered in conjunction with the Scoping Opinion and with the expectation that recommendations and advice as directed through this Scoping Opinion are implemented.

5.2 In Air Noise and Vibration

5.2.1 The Applicant has considered the potential impacts of in-air noise and vibration in Section 6 of the Scoping Report. In-air noise has been scoped in for both the construction and operation phases of the Proposed Works. Road traffic noise has been scoped in for both phases as there is potential for noise levels to increase as a result of the relocation of marshalling areas and noise from vehicular traffic. The Applicant proposes that vibration be scoped in for the construction phase but scoped out for the operational phase as no vibration effects are anticipated. The Scoping Report proposes scoping out blasting noise and blasting vibration for both phases.

5.2.2 The NatureScot representation highlights that rock blasting has the potential to affect receptors other than humans (e.g. birds, otters, marine mammals etc) and therefore onshore rock blasting must be scoped in for further assessment. The Applicant is directed to the NatureScot representation for further detail.

5.2.3 The Scottish Ministers broadly agree with the approach proposed in the Scoping Report to assess the potential impacts from in-air noise. However, the Scottish Ministers advise that blasting noise and vibration must be scoped in for the construction phase for further assessment in the EIA Report. The Scottish Ministers note the difficulty of assessing levels of blast noise prior to on-site testing and therefore advise a worst case approach is taken.

5.3 Underwater Noise

5.3.1 The Applicant has considered the potential impacts of underwater noise in Section 7 of the Scoping Report. The Applicant proposes to scope in rock stripping and potential blasting for the construction phase of the Proposed Works. Potential impact from piling is also scoped in for further assessment

for the construction phase. Dredging and vessel movements have been scoped out for both phases as it is predicted that harmful noise levels are unlikely.

5.3.2 NatureScot advised that dredging causes noise that can disturb marine mammals and must be considered further in the EIA Report. In addition, vessel movements should be scoped in for the construction and operational phases, as it is important all potential impacts are included and information to support assessment is produced. The Applicant is directed to the NatureScot representation for further detail.

5.3.3 The Scottish Ministers broadly agree with the approach for further assessment proposed in the Scoping Report but advise that dredging be scoped in for both phases and vessel movements must be scoped in for both phases.

5.4 Air Quality

5.4.1 The Applicant has considered the potential impacts of the construction phase on air quality in Section 8 of the Scoping Report. The Applicant proposes to scope in earthwork dust effects on human receptors. The impact of the movement of dirt and dust from the construction site on human receptors and the A82 trunk road is also proposed to be scoped in. Construction effects on human receptors and dust effects on ecological receptors have been proposed to be scoped out.

5.4.2 The Scottish Ministers agree with the approach for further assessment proposed in the Scoping Report and with the elements to be scoped in and out of the EIA Report.

5.5 Geology, Lands and Soils

5.5.1 The Applicant has considered potential impacts on geology, land and soils during construction in Section 9 of the Scoping Report. The Applicant proposes to scope out geology, land and soils from further assessment in the EIA Report. Taking account of mitigation identified in the Scoping Report Schedule of Mitigation, the effects are not predicted to be significant.

5.5.2 The Scottish Ministers agree that geology, lands and soil can be scoped out of further assessment in the EIA Report.

5.6 Water Quality

5.6.1 The Applicant has considered the potential impacts on water quality in Section 10 of the Scoping Report. The Applicant proposes to scope water quality out of further assessment in the EIA Report as the implementation of mitigation during the construction phase will ensure any potential impacts are not significant and impacts during the operational phase are not predicted to give rise to any significant effects on marine or terrestrial water quality.

5.6.2 The Scottish Ministers agree that water quality can be scoped out of further assessment in the EIA Report.

5.7 Seabed, Coastal Processes and Flooding

5.7.1 The Applicant has considered the potential impacts on the seabed, coastal processes and flooding in Section 11 of the Scoping Report. The Applicant proposes to scope out impacts to the seabed during the construction and operational phases of the Proposed Works as no significant impacts are anticipated. In addition, it is proposed that coastal processes and flooding are scoped out for the construction phase as no impacts are predicted but scoped in for the operational phase.

5.7.2 NatureScot advised it is content with the modelling method proposed to support the assessment on potential operational effects to coastal processes and with the elements to be scoped in and out of further assessment but highlight modelling must be complemented by expert geomorphological assessment. The Applicant is directed to the NatureScot representation in Appendix I for further information.

5.7.3 The Scottish Ministers agree with the content and approach to the assessment of impacts on seabed, coastal processes and flooding proposed in the Scoping Report .

5.8 Terrestrial Ecology and Ornithology

5.8.1 The Applicant has considered the potential impacts on terrestrial ecology and ornithology in Section 13 of the Scoping Report. The Applicant proposes to scope in habitat change, disturbance and accidental physical injury (i.e. road traffic collisions) for both the construction and operational phases. The Applicant proposes to scope in habitat degradation and spread of invasive non-native species (“INNS”) for the construction phase only, as they are not applicable during the operational phase.

5.8.2 The Scottish Ministers agree with the proposed elements to be scoped in and out for further assessment in the Scoping Report.

5.9 Benthic marine ecology

5.9.1 The Applicant has considered the potential impacts on benthic marine ecology in Section 14.1 of the Scoping Report. The Applicant proposes to scope in habitat changes, sedimentation and spread of marine INNS for both the construction and the operational phase.

5.9.2 NatureScot advised that the Scoping Report outlines that seagrass beds, a Priority Marine Feature ("PMF"), are within 1km of the Proposed Works. However, the full extent of seagrass beds has yet to be determined. The impact of dredging resulting in resuspension of sediment and siltation could impact the protected features. It noted that seagrass beds have been scoped out of further assessment. The justification for scoping out the impact to seagrass must be supported by further information. The Applicant is directed to the NatureScot representation in Appendix I for further information.

5.9.3 The Scottish Ministers broadly agree with the approach for further assessment as proposed in the Scoping Report that benthic marine ecology is scoped in for both the construction and operational phases. The Applicant must engage with NatureScot to address their concerns regarding the need for further assessment of the potential impacts to seagrass beds from the Proposed Works.

5.10 Marine Mammals

5.10.1 The Applicant has considered the potential impacts on marine mammals in Section 14.2 of the Scoping Report. The Applicant proposes to scope in potential impacts of underwater noise on marine mammal receptors. No significant effects are anticipated from vessel and construction activity on receptors after the implementation of mitigation and it therefore scoped out from further assessment for both the construction and operational phases. Operational impacts from underwater noise are scoped out as impacts are not predicted to be significant. Potential injury due to dredge disposal at sea is provisionally scoped in if the project design identifies a requirement for it during the construction phase. Injury to marine mammals during the maintenance dredge disposal is scoped out as the Applicant states that this risk is more appropriately assessed at the time of the dredge works.

5.10.2 The NatureScot representation broadly agrees with the proposed approach to the assessment of the potential impacts on marine mammals but disagrees that dredging should be scoped out as the activity does cause noise that can disturb marine mammals. Similarly, it requires that vessel

movements must be scoped in and must include any underwater noise related to the removal of existing structures and rock dumping for the new breakwater. Injury due to disposal at sea must be scoped in for both the construction and operational phases. The Applicant is directed to the NatureScot representation for further detail.

5.10.3 The Scottish Ministers broadly agree with the approach for further assessment proposed in the Scoping Report. However, the Scottish Ministers advise that injury due to dredge disposal at sea is scoped in for both construction and operational phases. Similarly, vessel movements must also be scoped in for further assessment including any generated underwater noise.

5.11 Fish and Shellfish

5.11.1 The Applicant has considered the potential impacts on fish and shellfish in section 14.3 of the Scoping Report. The Applicant proposes to scope out habitat changes, construction activity and dredge activity interactions for both phases. The Applicant proposes to scope in underwater noise effects for the construction phase.

5.11.2 The Scottish Ministers agree with the approach for further assessment proposed in the Scoping Report and the elements to be scoped in and out of the EIA Report.

5.12 Materials and waste

5.12.1 The Applicant has considered the potential impacts of materials and waste in section 15 of the Scoping Report. The Applicant states that impacts associated with materials and waste, with the implementation of mitigation, will not result in any significant effects. However, it is proposed that the materials and waste chapter will take a quantitative approach to inform a detailed design and procurement process to enable quantities of materials consumed to be identified to minimise generated waste from the Proposed Works. Therefore, consumption of materials and resources and waste management will be scoped in for the construction phase only. Material storage has been scoped out for the construction phase.

5.12.2 The Scottish Ministers agree with the proposed content and approach to materials and waste and the elements to be scoped in and out of the EIA Report.

5.13 Landscape and Visual

5.13.1 The Applicant considers the potential impacts on landscape and visuals in section 16 of the Scoping Report. It is proposed that this receptor is scoped out for the construction phase as potential effects will be temporary and reduced by considered siting of construction compounds. However, due to the scale of change and potential for long-term impacts from the Proposed Works it is proposed that landscape and visual effects are scoped in for further assessment for the operational phase.

5.13.2 The Scottish Ministers agree with the proposed content and approach in assessing landscape and visual effects and the elements to be scoped in and out of the EIA Report.

5.14 Archaeology and Cultural Heritage

5.14.1 The Applicant has considered the potential direct and indirect impacts on archaeological and cultural heritage assets in Section 17 of the Scoping Report. The Applicant proposes to scope in direct impacts on terrestrial and marine cultural heritage assets (designated and non-designated) within the scoping boundary, for both phases and impacts on the settings of designated cultural heritage assets and features within the 2km study area, for both phases. The Applicant proposes to scope out direct impacts on cultural heritage assets out with the scoping boundary for both phases, impacts on the settings and features of non-designated cultural assets and features for both phases and impacts on the settings of heritage assets beyond the study area for both phases.

5.14.2 Historic Environment Scotland (“HES”) identify two wreck sites, The Ness Queen and Craft the Moir, in the vicinity, but conclude that due to the shallow sediment and steep bathymetry in combination with the wooden construction and strong tides, it is unlikely the wrecks have survived in the area of the Proposed Works. The Applicant is directed to the Historic Environment Scotland representation for further detail.

5.14.3 The Scottish Ministers agree with the approach for further assessment as proposed in the Scoping Report and the elements to be scoped in and out of the EIA Report.

5.15 Traffic, Transport and Access

5.15.1 The Applicant has considered the potential impacts of traffic, transport and access in Section 18 of the Scoping Report. The Applicant proposes to scope in traffic, transport and access effects on road users and local residents for both phases.

5.15.2 Transport Scotland advised that a full abnormal roads assessment be provided along with the EIA, that identifies key pinch points on the trunk road network, as well as swept path analyses to identify any required change to street furniture or structures along the route.

5.15.3 The Scottish Ministers agree with the approach for further assessment proposed in the Scoping Report and advise that the Applicant addresses the Transport Scotland requirement to provide an abnormal roads assessment and swept path analysis with the EIA Report.

5.16 Navigation

5.16.1 The Applicant has considered the potential impacts on navigation in Section 19 of the Scoping Report. The Applicant proposes to scope in disruption to the Corran Ferry service for the construction phase. The Applicant proposes to scope in disruption to other loch users for the construction phase, and scope out for the operational phase. The Applicant proposes to scope in potential for collision incidents between vessels, and potential for collision with the new infrastructure for both phases. The Applicant proposes to scope out potential impacts on the Corran Point lighthouse for both phases.

5.16.2 The MCA advised that no elements of operation or construction with regards to shipping and navigation should be scoped out, pending the result of a Navigation Risk Assessment (“NRA”) which is yet to be undertaken. The MCA recommends the development of a robust Safety Management System under the Port Marine Safety Code and a hazard identification workshop for the Proposed Works. The Applicant is directed to the MCA representation for further detail.

5.16.3 In line with the representations of the MCA, the Scottish Ministers advise that all potential impacts identified in the navigation section (listed in Table 19.5.1) of the Scoping Report are scoped in for assessment in the EIA Report.

5.15 Population and Socioeconomics

5.15.1 The Applicant has considered the potential impacts on population and socioeconomics in Section 20 of the Scoping Report. The Applicant proposes to scope in social effects on the local community and economic effects on local businesses. The Applicant proposes to scope in the economic effects on fish farming for Loch Linnhe sites only. The Applicant proposes to scope out the economic effects on other local businesses and the effects on employment.

5.15.2 The Scottish Ministers agree with the assessment in the Scoping Report that the direct and indirect impact on jobs will be short-term, not significant in EIA terms and can be scoped out.

5.15.3 The Scottish Minsters note the recommendation of the MAU that education, training and housing are scoped in and consider that these impacts can be addressed by the Applicant under the social effects on the local community section of the EIA Report, which they have advised will be scoped in.

5.15.4 The Scottish Ministers broadly agree with the approach for further assessment as proposed in the Scoping Report, and recommend that further detail on the methodology and outcome of any social engagement should be included in the EIA. The Scottish Minsters direct the Applicant to the guidance supplied by the MAU for Socio-Economic Impact Assessment.

5.16 Human Health

5.16.1 The Applicant considers the impacts on human health in Section 21 of the Scoping Report. The Applicant proposes to scope out human health for both phases of the Proposed Works because mitigations identified in relation to other impact sources also mitigate impacts on human health.

5.16.2 The Scottish Ministers draw attention to the MAU recommendation that the Applicant undertake engagement with local stakeholders to establish if consensus exists around the predicted level of impact on human health.

5.16.3 The Scottish Ministers agree that human health can be scoped out for further assessment in the EIA Report providing stakeholder engagement does not identify any concerns.

5.17 Climate Change

5.17.1 The Applicant considers the potential impacts on climate change in Section 22 of the Scoping Report. The Applicant proposes to scope in greenhouse gases for both phases. The Applicant proposes to scope out climate change impacts for both phases.

5.17.2 The Scottish Ministers are mindful that Greenhouse Gas ("GHG") emissions from all projects contribute to climate change. In this regard, the Scottish Ministers highlight the IEMA Environmental Impact Assessment Guide "Assessing Greenhouse Gas Emissions And Evaluating Their Significance" ("IEMA GHG Guidance"), which states that "GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as a such any GHG emissions or reductions from a project might be considered significant." The Scottish Ministers have considered this together with the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 and the requirement of the EIA Regulations to assess significant effects from the Proposed Works on climate. The Scottish Ministers therefore advise that the EIA Report must include a GHG Assessment which should be based on a Life Cycle Assessment ("LCA") approach and note that the IEMA GHG Guidance provides further insight on this matter. The Scottish Ministers highlight however that this should include the pre-construction, construction, operation and decommissioning phases, including consideration of the supply chain as well as benefits beyond the life cycle of the Proposed Works.

5.17.3 The Scottish Ministers agree with the approach for further assessment as proposed in the Scoping Report.

5.18 Major Accidents and Disasters

5.18.1 The Applicant considers the potential of major accidents and disasters in section 23 of the Scoping Report and proposed to scope it out from further assessment in the EIA Report.

5.18.2 The Scottish Ministers note that no consultee comments were received on the topic of major accidents and disasters and agree that it can be scoped out from further assessment in the EIA report.

6. Application and EIA Report

6.1 General

6.1.1 The EIA Report must be in accordance with the 2017 MW Regulations and the Scottish Ministers draw your attention in particular to, regulation 6. In accordance with the 2017 MW Regulations, the Scottish Ministers advise that the EIA Report must be based on this Scoping Opinion.

6.1.2 A gap analysis template is attached at Appendix II to record the environmental concerns identified during the scoping process. This template should be completed and used to inform the preparation of the EIA Report. As part of the submission of the EIA Report the Scottish Ministers advise that Applicant must provide confirmation of how this Scoping Opinion is reflected in the EIA Report.

7. Multi-Stage Regulatory Approval

7.1 Background

7.1.1 The 2017 MW Regulations contain provisions regulating the assessment of environmental impacts. A multi-stage approval process arises where an approval procedure comprises more than one stage; one stage involving a principal decision and one or more other stages involving implementing decision(s) within the parameters set by the principal decision. While the effects which works may have on the environment must be identified and assessed at the time of the procedure relating to the principal decision, if those effects are not identified or identifiable at the time of the principle decision, assessment must be undertaken at the subsequent stage.

7.1.2 The definition in the 2017 MW Regulations is as follows: “application for multi-stage regulatory approval” means an application for approval, consent or agreement required by a condition included in a regulatory approval where (in terms of the condition) that approval, consent or agreement must be obtained from the Scottish Ministers before all or part of the works permitted by the regulatory approval may be begun”.

7.1.3 A marine licence, if granted, by the Scottish Ministers for the Proposed Works, may have several conditions attached requiring approvals etc. which fall under this definition, for example the approval of a CMS. When making an application for multi-stage approval the Applicant must satisfy the Scottish Ministers that no significant effects have been identified in addition to those already assessed in the EIA Report.

7.1.4 If during the consideration of information provided in support of an application for multi-stage regulatory approval the Scottish Ministers consider that the works may have significant environmental effects which have not previously been identified in the EIA Report (perhaps due to revised construction methods or updated survey information), then information on such effects and their impacts will be required. This information will fall to be dealt with as additional information under the 2017 MW Regulations, and procedures for consultation, public participation, public notice and decision notice of additional information will apply.

Signed

Peter Sparrow

13 December 2024
Authorised by the Scottish Ministers to sign in that behalf.

Appendix I: Consultation Responses & Advice

NatureScot

NatureScot
Scotland's Nature Agency
Buidheann Nàdair na h-Alba

Susan Macmillan
Planning Department
Highland Council
By email only - epc@highland.gov.uk

8 July 2024

Your ref: 24/02104/SCOP
Our ref: CEA175767

Dear Susan

Corran Ferry Infrastructure Improvement Scheme (EIA Screening reference 23/03630/SCRE)

Thank you for consulting us on the scope of the Environment Impact Assessment (EIA) in relation to our interests associated with the above proposal.

General Scoping Advice

We would, as always, refer the Applicant to our EIA Handbook for scoping advice and Standing advice for consultations that could affect protected species. The latter provides guidance on the issues that developers and their consultants should consider regarding their legal protection, licensing requirements, when and how to carry out surveys, and a list of measures that can be taken to minimise impacts.

Coastal/Marine Processes

Section 11 of the Scoping Report acknowledges (p60) that changes to the seabed and/or to coastal processes could have knock-on effects on marine biodiversity. It is important to also acknowledge that there are no physical-process receptors. This means that EIA assessment under this topic should consider only the impact Magnitude (the impact *pathway*) which can then be combined with Sensitivity in the Marine Biodiversity chapter of the EIA to produce a conclusion regarding impact *significance*.

We agree with the scoping in and out proposed in Table 11.5.1.

For the potential *operational-phase* effects of changes to coastal processes, we are content with the modelling method proposed to support the assessment. However, the modelling should be complemented by expert geomorphological assessment. In particular, there is clear evidence on aerial imagery that coastal sediment transport is predominantly north-eastwards i.e. 'up-loch', so the likelihood of sediment being 'dammed' against the SW side of the new slipways and breakwater should be used as a 'sense check' of the modelling results.

Ornithology

The scoping document identifies possible connectivity between the proposal and Ardgour & Moidart Special Protection Area (SPA) and Glen Etive & Glen Fyne SPA. This is due to the presence of potential golden eagle foraging habitat within 1 km of the proposal site which is also within foraging range of the boundary of the SPA.

Having checked the Golden Eagle Territory model, we can confirm there is predicted high usage areas of habitat within 1 km of the proposal. However, these areas are separated from the SPA by areas of unsuitable habitat. The territory centres of active SPA eagle territories are also at least 5 km from the proposal site. In addition, the main area of predicted eagle use is within 3 km of an active wider countryside golden eagle territory centre of the east of the proposal, meaning its use by SPA birds is unlikely. We therefore agree that the impacts on the SPAs are scoped in but an assessment is likely to conclude no adverse impact on site integrity.

Information on and/or a survey to determine winter roost sites for golden eagles in the wider countryside territory to the east would allow mitigation to be put in place if birds are roosting on the western edge of that territory within 1 km of the proposal site.

The scoping document also identifies potential connectivity to the Ben Nevis Site of Special Scientific Interest (SSSI) due to the presence of wintering snow buntings. Most of our wintering population of approx. 13,000 snow

buntings breed in Greenland and Iceland with only 60-80 pairs breeding in the UK. It is likely that the wintering birds on the site are from the larger Greenland/Iceland population rather than being the local Ben Nevis SSSI birds. Suitable wintering habitat is also unlikely to be a limiting factor for wintering snow bunting as they can be very nomadic in response to weather and food availability. Habitat loss or disturbance is therefore unlikely to be significant even if some or all of the birds are from the Ben Nevis breeding population. We can therefore advise that connectivity and an adverse impact on the SSSI population of snow buntings is highly unlikely.

Marine Ecology

Protected Areas
The proposal is not within any Special Protected Areas (SPAs), Special Areas of Conservation (SACs) or Marine protected areas (MPAs). The CFIISR (pages 73 – 83) reviews designated areas within 25 km of the proposal. We are content with the evaluation from a marine ecology perspective. The CFIISR has identified connectivity to the following qualifying features of SACs:

- Eileanan Agus Sgeiran Lios Mór SAC (with regard to harbour seal)
- Inner Hebrides and the Minches SAC (with regard to harbour porpoise)

Priority Marine Features (PMFs)
The proposal outlines that seagrass beds are within 1 km to the northwest of the proposal. The full extent of these Seagrass beds has yet to be determined and NatureScot are aware of ongoing discussions regarding the seagrass beds at Ardgour and a potential community led restoration project. Seagrass beds have a high sensitivity to changes in siltation rate, this includes either light continuous sedimentation or a single deposition event (>5 cm) and a high sensitivity to changes in water clarity (FeAST). The impact of dredging resulting in re-suspension of sediment and siltation could impact on the protected features. However, the project has scoped out the impact of the development on the seagrass beds due to size of the footprint (<0.52 km) and the distance to the beds (>500 m). The justification for scoping out the impact to seagrass should be supported by further information on the distance/survey evidence from seagrass communities and the distance from sites of dredging and if there is a risk of interactions; modelling of the potential sedimentation from the development and on-going works (dredging). We therefore request further information on the justification/evidence for scoping out the impacts to seagrass communities identified in the EIA scoping report.

The other PMFs identified (Kelp Beds, Kelp and Seaweed Communities on Sublittoral Sediment, Low or Variable Salinity Habitats and 'Tide-Swept Algal Communities') could be impacted by the development both directly (habitat change, removal, sedimentation) as well as indirectly by the introduction of marine Invasive Non-Native Species (INNS). The impact of the proposed development will be included in the EIA. The key area of impact appears to be on the eastern slipway development where kelp beds and kelp and Seaweed Communities on Sublittoral Sediment PMFS have been identified in the benthic surveys.

Annex I Reef Habitat
There is some overlap with the developed-on Annex I reef habitat on the eastern slipway. The developer has mapped/modelled the areas within the footprint where annex I reef will be located. The proposal will result in some damage to the Annex I feature within the footprint of the proposal. However, it is likely that the development will be colonised to some extent.

Marine Mammals
We note in section 14.2 that 4 species (porpoise, bottlenose dolphin, common dolphin and minke whale) have been highlighted to be considered further and are content with this.

We agree that rock stripping and blasting along with piling are scoped in. We disagree that dredging should be scoped out. This activity does cause noise that can disturb marine mammals and thus needs to be considered further. We note the intention to scope out vessel movements. Although we appreciate that the operational phase of the proposal will be largely the same, for the construction phase it is important that all potential impacts are included and information to support assessment produced. We would therefore advise that vessel movements is scoped in. This should include any underwater noise relating to removal of existing structures such as cutting and anything associated with rock dumping for the new breakwater.

We note the plan to include underwater noise and dredge disposal for the construction phase but scope out vessel and construction activity interaction. However, compliance with SMWWC is suggested in the report. We agree that vessel strikes are a low probability in this location and suggest that this could be covered in the Marine Mammal Protection Plan for completeness. Injury due to disposal at sea has been scoped out during the operations phase despite it having been scoped in for construction and the same risk having been highlighted in the accompanying text for maintenance dredging. We would therefore advise that this is scoped in for both construction and operation.

In-Air Noise and Vibration

We note the possibility of some onshore rock blasting stated in section 6.3 however the decision has been reached to scope this out (section 6.6) on the basis that it will be managed via communication with residents. This assumes that onshore rock blasting will only affect humans depending on the scale/location of blasting. However, it has the potential to affect other receptors (birds, otters, marine mammals etc.). We would therefore advise including onshore rock blasting at this stage.

Concluding Remarks

This advice is given without prejudice to a full and detailed consideration of the impacts of the proposal if submitted for formal consultation as part of the EIA or planning process.

The advice in this letter is provided by NatureScot, the operating name of Scottish Natural Heritage.

Yours sincerely,

[By email]

Mara MacKay
Operations Officer – Central Highland
Mara.MacKay@nature.scot

Historic Environment Scotland

HISTORIC ENVIRONMENT SCOTLAND | ÀRAINNEACHD EACHDRAIDHEIL ALBA

By email: MD.MarineLicensing@gov.scot

Marine Directorate
Marine Laboratory
375 Victoria Road
Aberdeen
AB11 9DB

Longmore House
Salisbury Place
Edinburgh
EH9 1SH

Enquiry Line: 0131-668-8716
HMConsultations@hes.scot

Our case ID: 300061008
Your ref: SCOP-0047
26 June 2024

Dear Marine Directorate

The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017

Scoping Request - Corran Ferry Infrastructure Improvement Scheme

Comments on scope of proposed Environmental Impact Assessment

Thank you for you consulting us on this Environmental Impact Assessment (EIA) scoping report, which we received on 29 May 2024 We have reviewed the details in terms of our historic environment interests. This covers World Heritage Sites, scheduled monuments and their settings, category A-listed buildings and their settings, inventory gardens and designed landscapes, inventory battlefields and Historic Marine Protected Areas.

The relevant local authority archaeological and cultural heritage advisors will also be able to offer advice on the scope of the cultural heritage assessment. This may include topics covered by our advice-giving role, and also other topics such as unscheduled archaeology, category B and C listed buildings, and conservation areas.

Proposed development

We understand that the proposed development comprises the redevelopment of the existing Corran Ferry crossing in Lochaber. The scheme will involve the construction of new infrastructure to facilitate the introduction of a new electric vessel (NEV) for the ferry service and improve facilities for users and operators of the ferry.

Scope of assessment

We welcome that direct impacts on marine cultural assets have been scoped into the EIA assessment for the proposals. We recommend that the applicant refers to the EIA Handbook for best practice advice on assessing cultural heritage impacts.

We note that two wrecks are recorded close to the proposals which have the potential to be affected by dredging and other works associated with the construction of new infrastructure and upgrading of slipways. Our comments regarding these assets are provided below in an annex to this covering letter.

Further information

Decisions that affect the historic environment should take the Historic Environment Policy for Scotland (HEPS) into account as a material consideration. HEPS is supported by our Managing Change guidance series.

We hope this is helpful. If you would like to submit more information about this or any other proposed development to us for comment, please send it to our consultation's mailbox, hmconsultations@hes.scot. If you have questions about this response, please contact Sam Fox at samuel.fox@hes.scot.

Yours sincerely

Historic Environment Scotland

ANNEX

Background

We received a pre-application consultation from the applicant in relation to early-stage discussions for the upgrade of ferry infrastructure in November 2022. In our response we noted that the proposals were unlikely to result in a significant impact on our interests, and we recommended that impacts on marine archaeology by the proposals be considered as part of the EIA application.

We responded to an EIA major pre-application request in January 2023 (22/04570/PREMAJ). These plans also included a new hydropower scheme to power the electric ferry. We noted that the indicative route for the overhead line (OHL) connecting the hydropower scheme to Ardgour Harbour entered the designated Ardgour House GDL (GDL00020) and that any application for an OHL in this area would also require the assessment of potential setting impacts on the scheduled monument Torr an Duin, fort, Loch nan Gabher (SM3220).

We also noted that impacts on marine archaeology would need to be assessed as part of any marine licence application undertaken in support of the proposals. The hydropower scheme does not form part of the current scoping consultation

Our Interests

Two wrecks are recorded close to the proposals which have the potential to be affected by dredging and other works associated with the construction of new infrastructure and upgrading of slipways.

22 ton motor drifter, the Ness Queen, lost in 1909 (Canmore ID: 213139)

The location assigned to the wreck is tentative and is based on information that the vessel burned out 300 yards to the NE of Corran lighthouse. It is unclear if any remains are likely to survive in situ in this highly tidal area of the narrows.

Craft the Moir, stranded in 1872 (Canmore ID: 255264)

The vessel, with a cargo of slate, was stranded at Corran, but appears to have been recovered.

In addition to these records, there are thirteen other records for wrecks (Canmore IDs: 327488, 327131 327130, 327129, 293373, 391736, 285952, 284895, 274293, 272909, 272419, 255293, 255277) are recorded in the vicinity, but are imprecisely located to the closest grid square at NN 01 63.

Our Advice

Due to the shallow sediment and steep bathymetry, in combination with the wooden construction of the vessels and strong currents in this location, it is unlikely that archaeological remains of the wrecks survive in the proposed development area. It is probable that they have been washed into the deeper channel or transported away over time. We are content that significant impacts on these heritage assets by the proposals are unlikely, but we welcome that they will be considered further in the EIA assessment for the proposals.

Historic Environment Scotland
26 June 2024

Maritime and Coastguard Agency (MCA)

Helen Duncan
Maritime and Coastguard Agency
Bay 2/24
Spring Place
105 Commercial Road
Southampton
SO15 1EG

www.gov.uk/mca

Your Ref: SCOP-0047

28th June 2024

Via email: MD.marinelicensing@gov.scot

Dear Marine Directorate Marine Licensing Team,

THE MARINE WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2017 ("the MW EIA Regulations") CONSULTATION UNDER PART 4, REGULATION 14(4) OF THE MW EIA REGULATIONS

Scoping Request - Corran Ferry Infrastructure Improvement Scheme (CFIIS)

Thank you for your email dated 29th May 2024 inviting comments on the Scoping Report for the proposed works to construct a new ferry service infrastructure at the Corran Narrows by The Highland Council. The Scoping Report has been considered by representatives of UK Technical Services Navigation, and the Maritime and Coastguard Agency (MCA) would like to respond as follows:

The MCA has an interest in the works associated with the marine environment, and the potential impact on the safety of navigation, access to ports, harbours and marinas and any impact on our search and rescue obligations.

The proposal will involve the construction of new infrastructure in the village of Ardgour, and just north of the 'Corran' settlement in the region of Nether Lochaber, to facilitate the introduction of a new electric vessel for the ferry service and improve facilities for users and operators of the Corran Ferry.

The works will include (but are not limited to):

1) On the Ardgour side, a slipway, overnight berthing, vessel charging facilities
2) On the Nether Lochaber side, a slipway, breakwater with vessel alignment structure
3) Dredging on both the Ardgour and Nether Lochaber sides will also be required, as will the removal of sections of redundant sub-sea cabling near the Ardgour infrastructure.

The MCA would expect any works in the marine environment to be subject to an appropriate

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Navigation Risk Assessment (NRA) to assess the likely impacts to fishing, recreational and commercial traffic within the study area and the likely associated risks to shipping and navigation.

We note the applicant's commitment in Table 23.3.1 to carry out an NRA, which will be used to support the Environmental Impact Assessment (EIA) Report. The MCA believes that the inclusion of vessel data for the study area would be helpful in considering the potential impact of the CFIIS on relevant local stakeholders and the data should capture seasonal variations. We note that the risk assessment will be informed by consultation with other parties and we recommend the inclusion of the power company SSEN to the stakeholder list for consideration of the decommissioning of the power cables. The NRA should address both the construction phase and the ongoing safe operation of the site and what is required with regards to risk mitigation.

We note that in Table 19.5.1 some elements of operation and construction are scoped out of the assessment however The MCA would expect no effects to be scoped out with regards to shipping and navigation, pending the outcome of the Navigation Risk Assessment and further stakeholder consultation. It is not yet clear which methodology for formal risk assessment is to be used for the EIA. However, the MCA would expect the NRA to be carried out in accordance with the Port Marine Safety Code (PMSC) and its Guide to Good Practice (GTGP).

We note that the site does not fall within the jurisdiction of a Statutory Harbour Authority (SHA). The new facilities should be treated as a Marine Facility as per the PMSC. The Code is applicable both to statutory harbour authorities and to other marine facilities which may not have statutory powers and duties. We note under paragraph 3.1.3 it states: "The overall objective is to maintain risk levels within a limit that is deemed 'as low as reasonably practicable' (ALARP) following the requirements of the Port Marine Safety Code (DfT, 2016)".

The scoping report also states in the Major Accidents and Disasters chapter that navigational incidents are scoped out. However with the development and update of a proportionate NRA that will cover both the identification and mitigation of potential navigation impacts, we are content.

Finally, to address the ongoing safe operation of the marine interface for this project, the MCA would again point the applicant in the direction of the Port Marine Safety Code (PMSC) and its Guide to Good Practice. They will need to develop a robust Safety Management System (SMS) for the project under this code.

To ensure local stakeholder input, the MCA would recommend a hazard identification workshop be held, to bring together relevant navigational stakeholders for the area to discuss the potential impacts on navigational safety. Decisions relating to further controls should be agreed in consultation with other interested parties to determine whether the ALARP status has been met for each risk. The outputs of the NRA should be used to inform a judgement on significance of effects arising from the Project.

The MCA is satisfied with the scoping report at this stage as the basis for an Environmental Impact Assessment and an Environmental Statement from the shipping and navigation perspective subject to the clarification required above. The MCA would expect no effects to be scoped out of the assessment with regards to shipping and navigation, pending the outcome of the NRA and further stakeholder consultation.

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We hope you find this information useful at scoping stage.

Yours faithfully,

[Redacted]

Helen Duncan
Marine Licensing Project Lead
UK Technical Services Navigation

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Royal Yachting Association

RYA SCOTLAND

Caledonia House
1 Redheughs Rigg
South Gyle
Edinburgh, EH12 9DQ

Tel: 0131 317 7388
www.ryascotland.org.uk

11 June 2024

Andrew Kyle,
Marine licensing casework officer
Marine Directorate – Licensing Operations Team
Scottish Government
Marine Laboratory, 375 Victoria Road,
Aberdeen,
AB11 9DB
md.marinelicensing@gov.scot

Dear Mr Kyle,

SCOP-0047 - Scoping Request -
Corran Ferry Infrastructure Improvement Scheme

I have read the relevant parts of the above report on behalf of RYA Scotland and agree that navigation should be scoped in for the construction phase. I foresee no issues in the operational phase of the project. RYA Scotland would be happy to assist with a Navigational Risk Assessment and to suggest ways of publicising Notices to Mariners to recreational boaters.

There are visitor moorings in An Camus Aiseig immediately south of the fish farm and there may be other moorings as well. This can be checked with Crown Estate Scotland. There are no such issues on the east side of the Narrows.

We recognise the importance of this project as a crucial transport link.

Yours sincerely,

[Redacted]

Dr G. Russell FCIEEM(retd) FRMetS
Planning and Environment Officer, RYA Scotland

The Royal Yachting Association Scotland. A company limited by guarantee and registered in Scotland. Number SC219439

Scottish Water

Monday, 03 June 2024

Marine Licensing
375 Victoria Road

Aberdeen

Development Operations
The Bridge
Buchanan Gate Business Park
Cumbernauld Road
Stepps
Glasgow
G33 6FB

Development Operations
Freephone Number - 0800 3890379
E-Mail - DevelopmentOperations@scottishwater.co.uk
www.scottishwater.co.uk
Follow Us

Dear Customer,

Corran Ferry Infrastructure Improvement Scheme - Ardgour, North of Corran Nether, Corran, PH33 6SE
Planning Ref: SCOP-0047
Our Ref: DSCAS-0111022-HP2
Proposal: new infrastructure in the village of Ardgour, north of the 'Corran - 22/04570/PREMAJ.

Please quote our reference in all future correspondence

Audit of Proposal

Scottish Water has no objection to this planning application; however, the applicant should be aware that this does not confirm that the proposed development can currently be serviced. Please read the following carefully as there may be further action required. Scottish Water would advise the following:

Water Capacity Assessment

Scottish Water has carried out a Capacity review and we can confirm the following:

- There is currently sufficient capacity in the Camisky Wellfield Water Treatment Works to service your development. However, please note that further investigations may be required to be carried out once a formal application has been submitted to us.

Waste Water Capacity Assessment

- There is currently sufficient capacity for a foul only connection in the Corran Ferry Sep Waste Water Treatment works to service your development. However, please

note that further investigations may be required to be carried out once a formal application has been submitted to us.

Please Note

- The applicant should be aware that we are unable to reserve capacity at our water and/or waste water treatment works for their proposed development. Once a formal connection application is submitted to Scottish Water after full planning permission has been granted, we will review the availability of capacity at that time and advise the applicant accordingly.

Surface Water

For reasons of sustainability and to protect our customers from potential future sewer flooding, Scottish Water will not accept any surface water connections into our combined sewer system.

There may be limited exceptional circumstances where we would allow such a connection for brownfield sites only, however this will require significant justification from the customer taking account of various factors including legal, physical, and technical challenges.

In order to avoid costs and delays where a surface water discharge to our combined sewer system is anticipated, the developer should contact Scottish Water at the earliest opportunity with strong evidence to support the intended drainage plan prior to making a connection request. We will assess this evidence in a robust manner and provide a decision that reflects the best option from environmental and customer perspectives.

General notes:

- Scottish Water asset plans can be obtained from our appointed asset plan providers:
    - Site Investigation Services (UK) Ltd
    - Tel: 0333 123 1223
    - Email: sw@sisplan.co.uk
    - www.sisplan.co.uk
- Scottish Water's current minimum level of service for water pressure is 1.0 bar or 10m head at the customer's boundary internal outlet. Any property which cannot be adequately serviced from the available pressure may require private pumping arrangements to be installed, subject to compliance with Water Byelaws. If the developer wishes to enquire about Scottish Water's procedure for checking the water pressure in the area, then they should write to the Customer Connections department at the above address.
- If the connection to the public sewer and/or water main requires to be laid through land out-with public ownership, the developer must provide evidence of formal approval from the affected landowner(s) by way of a deed of servitude.

- Scottish Water may only vest new water or waste water infrastructure which is to be laid through land out with public ownership where a Deed of Servitude has been obtained in our favour by the developer.

- The developer should also be aware that Scottish Water requires land title to the area of land where a pumping station and/or SUDS proposed to vest in Scottish Water is constructed.

- Please find information on how to submit application to Scottish Water at our Customer Portal.

Next Steps:

All Proposed Developments

All proposed developments require to submit a Pre-Development Enquiry (PDE) Form to be submitted directly to Scottish Water via our Customer Portal prior to any formal Technical Application being submitted. This will allow us to fully appraise the proposals.

Where it is confirmed through the PDE process that mitigation works are necessary to support a development, the cost of these works is to be met by the developer, which Scottish Water can contribute towards through Reasonable Cost Contribution regulations.

Non Domestic/Commercial Property:

Since the introduction of the Water Services (Scotland) Act 2005 in April 2008 the water industry in Scotland has opened to market competition for non-domestic customers. All Non-domestic Household customers now require a Licensed Provider to act on their behalf for new water and waste water connections. Further details can be obtained at www.scotlandontap.gov.uk

Trade Effluent Discharge from Non-Domestic Property:

- Certain discharges from non-domestic premises may constitute a trade effluent in terms of the Sewerage (Scotland) Act 1968. Trade effluent arises from activities including; manufacturing, production and engineering; vehicle, plant and equipment washing, waste and leachate management. It covers both large and small premises, including activities such as car washing and launderettes. Activities not covered include hotels, caravan sites or restaurants.
- If you are in any doubt as to whether the discharge from your premises is likely to be trade effluent, please contact us on 0800 778 0778 or email TEQ@scottishwater.co.uk using the subject “Is this Trade Effluent?". Discharges that are deemed to be trade effluent need to apply separately for permission to discharge to the sewerage system. The forms and application guidance notes can be found here.

- Trade effluent must never be discharged into surface water drainage systems as these are solely for draining rainfall run off.
- For food services establishments, Scottish Water recommends a suitably sized grease trap is fitted within the food preparation areas, so the development complies with Standard 3.7 a) of the Building Standards Technical Handbook and for best management and housekeeping practices to be followed which prevent food waste, fat oil and grease from being disposed into sinks and drains.
- The Waste (Scotland) Regulations which require all non-rural food businesses, producing more than 5kg of food waste per week, to segregate that waste for separate collection. The regulations also ban the use of food waste disposal units that dispose of food waste to the public sewer. Further information can be found at www.resourceefficientscotland.com

I trust the above is acceptable however if you require any further information regarding this matter please contact me on **0800 389 0379** or via the e-mail address below or at planningconsultations@scottishwater.co.uk.

Yours sincerely,

Ruth Kerr.
Development Services Analyst
developmentoperations@scottishwater.co.uk

Scottish Water Disclaimer:

"It is important to note that the information on any such plan provided on Scottish Water's infrastructure, is for indicative purposes only and its accuracy cannot be relied upon. When the exact location and the nature of the infrastructure on the plan is a material requirement then you should undertake an appropriate site investigation to confirm its actual position in the ground and to determine if it is suitable for its intended purpose. By using the plan you agree that Scottish Water will not be liable for any loss, damage or costs caused by relying upon it or from carrying out any such site investigation."

Royal Society for the Protection of Birds

From:	Stephanie Cope
To:	MD Marine Licensing
Cc:	Andy Robinson; Niamh Coyne
Subject:	SCOP-0047 - Scoping Request - Corran Ferry Infrastructure Improvement Scheme
Date:	28 June 2024 17:06:15
Attachments:	Outlook-The RSPB a.png Outlook-The RSPB S.png Outlook-The RSPB S.png Outlook-qm1jwq3f.png

Dear Marine Licencing Team,

THE MARINE WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2017 ("the MW EIA Regulations")

CONSULTATION UNDER PART 4, REGULATION 14(4) OF THE MW EIA REGULATIONS

SCOP-0047 - SCOPING REQUEST - CORRAN FERRY INFRASTRUCTURE IMPROVEMENT SCHEME

Thank you for consulting RSPB Scotland concerning the above-named Scoping Request.

We do not intend to submit comments at this time, other than to note that the installation of nesting boxes for Black Guillemot *Cepphus grylle* would comprise a welcome and appropriate action in respect of Biodiversity Enhancement activity for this proposal.

Sending all good wishes for the weekend ahead,

Stephanie.

Stephanie Cope | (she/her/hers)
Conservation Officer - Argyll, Arran, Ardnamurchan
stephanie.cope@rspb.org.uk
[Redacted] | Monday to Friday, 09:00 - 17:00 | email/mobile best as I work remotely

RSPB South Scotland
10 Park Quadrant
Glasgow, G3 6BS
rspb.org.uk

Protecting habitats, saving species and helping to end the nature and climate emergency.
Nature is in crisis. Together we can save it.

The Royal Society for the Protection of Birds (RSPB) is a registered charity:

England and Wales no. 207076, Scotland no. SC037654.

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Transport Scotland

Development Management and Strategic Road Safety
Roads Directorate

George House 36 North Hanover St Glasgow G1 2AD
george.smith@transport.gov.scot

TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

Andrew Kyle
Marine Laboratory
375 Victoria Road
Aberdeen
AB11 9DB

md.marinelicensing@gov.scot

Your ref:
SCOP-0047

Our ref:
GB01T19K05

Date:
24/06/2024

Dear Sirs,

THE MARINE WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2017 ("THE MW EIA REGULATIONS")

CONSULTATION UNDER PART 4, REGULATION 14(4) OF THE MARINE WORKS EIA REGULATIONS

SCOPING REQUEST - CORRAN FERRY INFRASTRUCTURE IMPROVEMENT SCHEME

With reference to your recent correspondence on the above development, we acknowledge receipt of the Scoping Report prepared by Affric in support of the above development.

This information has been passed to SYSTRA Limited for review in their capacity as Term Consultants to Transport Scotland – Roads Directorate. Based on the review undertaken, Transport Scotland would provide the following comments.

Proposed Development

The proposed development comprises new ferry service infrastructure at the Corran Narrows under the Corran Ferry Infrastructure Improvement Scheme. The scheme will involve the construction of new infrastructure in the village of Ardgour as well as north of Corran in Nether Lochaber. We note that a new access, in the form of a priority junction, leading to the new slipway will be constructed to the north of the existing slipway access from the A82(T). The new access junction will lead to a proposed marshalling area, and a separate parking area.

Transport Scotland was consulted at the Pre-application stage by The Highland Council for this application, with comments provided in January 2023. In this response, we noted that with regard to the new access onto the A82(T), any proposed changes to the trunk road network must be discussed and approved (via a technical approval process) by the appropriate Area Manager, who in this instance is David Devine. Appropriately scaled drawings (including the visibility splays) for any new or amended junction will require to be forwarded to David for his approval. David can be contacted at david.devine@transport.gov.scot.

Assessment of Environmental Impacts

Chapter 18 of the SR presents the proposed methodology for the assessment of Traffic, Transport and Access. This states that the thresholds for further assessment as presented within the IEMA publication "Environmental Assessment of Traffic and Movement" (IEMA, 2023) will be used as a screening exercise for the application. Transport Scotland is satisfied with this approach.

The study area for the assessment is identified as follows:

- A82(T), between Keppanach and Corrychurrachan;
- A861, between A82 and Corran Ferry slipway; and
- A861, between Clovullin and Ardgour Parish Church.

We note that baseline traffic flow data for the A82(T) and A861 will be obtained from new Automatic Traffic Count surveys completed in 2024., with three counts on the A82(T). These are located at the existing A82(T)/ A861 priority junction, with a second located on the A82(T) north of the proposed new access junction and a third to the south of the proposed new access junction. Transport Scotland would add that National Road Traffic Forecast (NRTF) Low Traffic Growth assumptions will require to be used to provide a common future year baseline to coincide with the expected construction traffic peak.

Abnormal Loads Assessment

No mention is made of any requirement for Abnormal Indivisible Loads, however, should these be required, Transport Scotland will require to be satisfied that the size of loads proposed can negotiate the selected route and that their transportation will not have any detrimental effect on structures within the trunk road route path.

A full Abnormal Loads Assessment report should be provided with the Environmental Impact Assessment Report (EIAR) that identifies key pinch points on the trunk road network. Swept path analysis should be undertaken and details provided with regard to any required changes to street furniture or structures along the route.

I trust that the above is satisfactory but should you wish to discuss any issues raised in greater detail please do not hesitate to contact me or alternatively, Alan DeVenny at SYSTRA's Glasgow Office can assist on 0141 343 9636.

Yours faithfullv
[Redacted]

George Smith

Transport Scotland
Roads Directorate

cc Alan DeVenny – SYSTRA Ltd.
david.devine@transport.gov.scot

Argyll and Bute Council

From:	Holdstock, Lorraine
To:	MD Marine Licensing
Cc:	Andrew Kyle; Lodge, Mark
Subject:	RE: SCOP-0047 - Scoping Request - Corran Ferry Infrastructure Improvement Scheme [OFFICIAL]
Date:	03 June 2024 15:28:41
Attachments:	image001.png image002.png image003.png

Classification: OFFICIAL

Good Afternoon Mr. Kyle,

Thank you for contacting Argyll and Bute Council regarding the Scoping report: Ferry Infrastructure Improvement – Corran, Loch Linnhe, Lochaber. Given the distance from the Corran Ferry Slipway at Lochaber, I do not anticipate that there would be any associated impacts to Argyll and Bute Council's area of responsibility as a result of the proposed marine works. I therefore do not propose to submit a consultation response.

With thanks and kind regards,

Lorraine
Lorraine Holdstock BSc MSc
Marine & Coastal Development Policy Officer
Development Policy
Development and Economic Growth
Argyll and Bute Council
01631 567 909
lorraine.holdstock@argyll-bute.gov.uk
www.argyll-bute.gov.uk

Marine Analytical Unit

Scottish Government
Riaghaltas na h-Alba

Corran Ferry Infrastructure Improvement Scheme

Marine Analytical Unit ("MAU") Response
Marine Directorate

The scoping report for the Corran Ferry Infrastructure Improvement Scheme includes a description of a range of potential impacts. This response focuses only on the assessment of social and economic impacts.

Scoping of impacts

It is proposed in the scoping report that the impact of employment and income, education and training and housing are scoped out of the final assessment. Our opinion is that these factors should be scoped in for the final assessment.

Potential social effects to local communities and effects to specific local businesses proposed as scoped in to the EIA for both construction and operational phases.

A range of potential effects on residents including dust, noise and impacts on access were identified, although these will be considered in their specific sections (Sections 8, 6 and 18 respectively).

Human health is proposed to be scoped out of the report. They state that the relevant effects on human health are covered in other parts of the EIA report. We note that no external stakeholder engagement has been carried out around the decision to remove human health from the report, as "*input from the NHS Highlands Health Board has not been deemed appropriate at this stage due to the nature of the project and potential effects*.". We would recommend engagement with local stakeholders around these issues to see if there is consensus in regards to the prediction of a lack of impacts on human health and health services in the area.

Please see Annex 1 for general advice on socio-economic impact assessment ("SEIA"). As this guidance is intended for large developments, please adjust the approach to the assessment appropriately. The general advice is provided to assist in the design of an appropriate methodology. As the socio-economic impacts are not anticipated to be large, a lighter touch assessment will be sufficient.

We would recommend using a reasonably broad range of up-to-date data sources to be analysed. Please see Annex 1 for more advice and possible data sources.

Economic Impacts

In terms of economic impacts, the SEIA should analyse the gross value added ("GVA") and employment impacts of the proposed development, including the direct, indirect and induced impacts and take account of deadweight, leakage, displacement

and substitution. The assessment of the employment impacts should focus on the years of employment and type of jobs.

Social Impacts and Engagement with local communities

The report states that **"**In the lead up to the Scoping Report and throughout the development design, a programme of consultation has and will continue to be undertaken with statutory and non-statutory consultees, including members of the public.". However detail on engagement with non-statutory consultees was minimal. It would be helpful to have more information about how this engagement will be done and who the target groups are for it. Please see Annex 1 for general advice on socio-economic impact assessments ("SEIA") and the assessment of social impacts. The assessment should be rigorous and proportionate to the size of the development. We advise that the assessment of potential socio-economic impacts would benefit from the engagement with local communities (see Methods Toolkit referenced in Annex 1).

Conclusions

Overall, we expect to see a detailed description of the methodology used to assess social and economic impacts in the final assessment, including specific details about the methodological approach taken and any key assumptions that underpin any findings. Please provide further detail on the stakeholder engagement that was undertaken, particularly how views were sought from the local community. This is a small scale development, and the approach to SEIA should be proportionate.

Annex 1: General Advice for Socio-Economic Impact Assessment
Marine Analytical Unit (MAU)
Marine Directorate
March 2024

This document sets out some suggestions for delivering socio-economic impact assessment drawing on the professional expertise of the Marine Analytical Unit (MAU), Marine Directorate.

Section 1. Some general best practice tips

- Take a proportionate approach to SEIA in line with the size of the development
- Consider offshore and onshore components of the development in the same assessment.
- Employ experts to design and carry out the assessment. The relevant expertise would include:
    - Social research and economist training, qualifications and experience
    - Familiarity and experience with appropriate methods for each discipline (including economic appraisal, social research methods such as surveys, sampling, interviews, focus groups and participatory methods)
- Consider potential secondary socio-economic impacts of any changes that affect the other relevant receptor groups covered in the wider EIA e.g. commercial fisheries, cultural heritage and archaeology and visual impacts.
- Include consideration of the cumulative impact of multiple offshore developments.
- Outline the rationale for scoping out impacts that are deemed to be minimal, including any evidence or analysis that has been used. If this is not provided it can be difficult for MAU to understand why impacts have been scoped out and we may suggest scoping them back in.

Section 2. Key components of a Socio-economic Impact Assessment

We set out below what we consider to be the key steps to an assessment. We recommend a combined approach so that social and economic impacts are covered together in the assessment, whilst acknowledging that different methodologies for social and economic impacts assessment are needed at certain stages, and that the two disciplines are distinct.

We wish to highlight the importance of stakeholder engagement throughout the assessment, and the use of social research methods (see Methods Toolkit referenced at the end of this Annex) to gather primary data and first hand perspectives from particular groups and communities that are affected. These are helpful in order to better understand the nature and degree of impacts that might be caused by changes that are expected occur. A change in itself may or may not bring about tangible impact, impacts may vary for different people or be perceived in different ways, are affected by individual values and attitudes, and conditioned by the context.

Stakeholder engagement and data collection can occur at a number of stages in the SEIA process and may involve similar methodologies but there are important differences to note. The primary aims of stakeholder engagement are to inform, consult or involve key stakeholders, and to communicate information and gather feedback. Data collection, in contrast is a more rigorous analytical process involving:

- Setting out a planned methodology in advance with clear objectives of what you wish to achieve through data collection
- Sampling strategies that take account of the demographic variations in the population and the need to include difficult to reach groups
- Robust methods to collect information from people in a neutral and unbiased way
- Awareness of how data will be analysed and reported on to obtain and disseminate robust conclusions
- Taking account of research ethics including informed consent, and data protection requirements under GDPR

The stages below are divided into the activities that we suggest are **before** the developer submits a request for a scoping opinion and those that are done **after** the scoping phase. We recommend an iterative approach which means that steps inform each other, information is built up over time, and some steps may be repeated or done in a different order.

The key steps should include:

Pre-scoping activities

1) **Getting started:** Employ economist and social research experts and work with them to develop a plan for the SEIA that sets out data requirements, and the proposed social and economic data collection and impact assessment methodologies, timescales, any data protection considerations, risk assessment and ethical issues that might arise from the work.

2) Develop a **detailed description** of the planned development and consider the project phases where socio-economic impacts might be experienced (covering development, construction, operation and maintenance and decommissioning phases). Start to map out potential socio-economic impacts and initial consideration of areas of impact on land that will need to be covered.

3) **Initial scoping of impacts:** develop a broad list of potential impacts informed by experts (including social researcher, economist, local representatives from key groups, community stakeholders and others).

4) **Define potential impact areas on land** taking into account locations and connections between activities. Different types of impacts may be experienced at different geographic levels, some in the area nearest the landfall or the nearest coastline to the development at sea, and others much further away (at Scotland level, UK level and internationally). The geographical scale at which social impacts are experienced may be different for social impacts compared with economic impacts. There may be multiple epicentres from which impacts radiate

including the site of the development, land-based areas such as landfall and grid connections, construction bases and places from which the development is visible. Activities that take place in the sea are also relevant for defining the impact area on land, for example the location of fishing activity and ports where fish are landed. The definition of the impact area will inform which communities and which sectors are included in the assessment and vice versa, so this exercise needs to be done iteratively with step 3, the initial scoping of impacts.

5) **Stakeholder mapping** is required to identify all the people, groups and stakeholders who may be affected by the development and is a first step in order to conduct effective stakeholder engagement. This exercise is informed by the definition of the impact area. A broad approach is recommended. Stakeholders are likely to include local communities, businesses, workers, other users of the sea, interest groups, community councils and so on.

   Steps 4 and 5 may lead to a change in the list of potential impacts so this will need refined/checked.

6) **Stakeholder engagement (with those affected by the development, sea users, communities etc)** is a key requirement of SEIA that is done at different stages of the process. We recommend doing some initial stakeholder engagement before submitting the scoping report. Stakeholder engagement will fulfil a number of requirements:

   - **Provide information about the development** so that those who might be affected are able to make an informed judgement about potential impacts
   - **Present and refine list of potential impacts based on feedback** - identify impacts that are most relevant and add any additional ones that are identified
   - **Collect initial data/ insights from stakeholders** on what potential socio-economic impacts (to be developed later)
   - **Build relationships** with the community and key groups affected for later stages of the SEIA process so that they can understand the decisions making process and how they can influence it.

   There are many **participatory methodologies** that can be used for effective stakeholder engagement that provide a deliberative space for community discussions.

   This stage may also require the setting up of governance structures and a community liaison officer. **Early engagement** with those who might be affected is very important, as is meaningful and inclusive engagement where people feel that they are being listened to and that their feedback will be acted upon. It is important to set out clearly how stakeholder engagement is being done for the SEIA specifically.

7) **Gather contextual information** to develop a social and economic profile of the area prior to the development that will help with setting the baseline and impact

prediction, identifying potential industries and communities that might be affected and sources of data that can be used in the assessment. This might include primary data collection using social research methods (such as surveys, interviews, focus groups) as well as desk based analysis (of existing data sets such as fishing data, population data).

Primary data collection may occur alongside participatory activities (e.g. engagement events) but must be done in a rigorous and systematic fashion and the findings should be robustly analysed and incorporated into the SEIA. Impacts that are identified for the other receptors in the wider EIA may also have socio-economic consequences and so it may be important to include these in the SEIA.

8) **Produce list of anticipated impacts to be covered in the scoping report** setting out the range of potential impacts that could occur, building on what has already been done using data and insights that have been collected from various activities described above. Details of the methods that have been used should be included to enable Marine Directorate to determine if the analysis is based on a robust and appropriate approach. Justification should be provided for any impacts that are scoped in or out. This could be based on suggestions made by stakeholders and the public during stakeholder engagement or an assessment based on the analysis of primary and secondary data.

   It is helpful if the scoping report includes details on the approach to be used for the SEIA including methods for data collection, planned stakeholder engagement activities and data-sets to be used.

Post scoping activities for the SEIA

The scoping opinion will advise on the final list of socio-economic impacts to be assessed in the SEIA. This may require additional data collection/ social research to enable a more rigorous assessment of a narrower set of anticipated impacts. It may also require further stakeholder engagement in order to check the significance of impacts with different groups, and the acceptability of mitigation options.

The data and information that has been collected throughout the scoping phase will be used to conduct steps 9, 10 and 11 below.

9) **Conduct baseline analysis** to assess the situation in the absence of the development, to provide a point of comparison against which to predict and monitor change. Appropriate social and economic measures should be used for the baseline and cover relevant issues (see section 4 for suggested data sources). Key stakeholders and other interested parties including affected communities and sectors may be aware of baseline data to be included, and this can be explored in the participatory approaches described above. The findings from social research can also be included in the baseline. Note that baseline data can be presented in the scoping report but is also the first stage of the SEIA and so should be included in the SEIA report.

10) Predict impacts and assess their significance (otherwise known as impact appraisal or options appraisal)

Through analysis, estimate the social and economic changes and their expected impacts, considering any alternative development options and how significant the impacts might be. This is the core part of the assessment and forms the main part of the assessment report. Different methodologies and both primary and secondary data inform this part of the exercise.

Different phases of the development should be covered (development, construction, operation and maintenance) and also transitions between phases (if relevant).

The knock on socio-economic consequences of impacts in other parts of the EIA assessment should be assessed here, such as the impact on commercial fisheries, and impacts on related industries such as tourism could also be included.

It is important to consider distribution of impacts among different social groups (covering protected quality characteristics, socio-economic groups and geographic area where relevant to do so).

Economic impact appraisal should include consideration of:

- Direct, indirect and induced impacts;
- Leakage, displacement and substitution effects;
- Deadweight loss;
- Cumulative impacts;
- Sensitivity analysis to account for risk, uncertainty and optimism bias.

There are a range of methodologies for calculating direct, indirect and induced impacts. These include the appropriate use of multipliers, a local content methodology, stakeholder involvement and expert opinion.

Modelling approaches should be realistic, based on robust data, and avoid over promising the economic impacts.

All prices should be presented in real terms (excluding inflation) and should state which year the prices represent.

11) Development enhancement, mitigation strategy and complete SEIA report.

There may be an opportunity for adaptation or other approaches to mitigate potentially adverse impacts and to maximise positive opportunities. This may include engagement with the community to develop a strategy for enhancing benefits and mitigating against impacts; or development of a Community Benefit Agreement (CBA). Again these activities should be done collaboratively with stakeholders where relevant and appropriate.

The SEIA report should clearly set out the methods used in the assessment, justification for decision made such as scoping certain impacts in or out of the

assessment, and the approach to analysis. The report should cover the baseline analysis and results of the impact prediction or appraisal, and distributional impacts . Social and economic impacts can be set out separately (where this makes sense) and together where they overlap.

It is good practice for the report to be reviewed by the people (i.e. the wider group of stakeholders and communities) who were involved in providing data for its production.

Section 3. Examples of different types of socio-economic impacts

In the literature social and economic impacts are defined in many different ways. Sometimes social and economic impacts are covered separately, whilst other sources refer to socio-economic impacts.

The following table sets out some commonly identified socio-economic impacts.

Examples of Socio-economic Impacts from Glasson 2017[1]

1. Direct economic:

- GVA
- employment, including employment generation and safeguarding of existing employment;
- characteristics of employment (e.g. skill group);
- labour supply and training; and
- other labour market effects, including wage levels and commuting patterns.

2. Indirect/induced/wider economic/expenditure:

- employees' retail expenditure (induced);
- linked supply chain to main development (indirect);
- labour market pressures;
- wider multiplier effects;
- effects on existing commercial activities (e.g. tourism; fisheries);
- effects on development potential of area; and

3. Demographic:

- changes in population size; temporary and permanent;
- changes in other population characteristics (e.g. family size, income levels, socio-economic groups); and
- settlement patterns

4. Housing:

- various housing tenure types;

[1] Glasson J (2017a) "Socio-economic impacts 2: Overview and economic impacts" in Therivel R and Wood G (eds.), Methods of Environmental and Social Impact Assessment, Abingdon: Routledge

- public and private;
- house prices and rent / accommodation costs;
- homelessness and other housing problems; and
- personal and property rights, displacement and resettlement

5. Other local services:

- public and private sector;
- educational services;
- health services; social support;
- others (e.g. police, fire, recreation, transport); and
- local authority finances

6. Socio-cultural:

- lifestyles/quality of life;
- gender issues; family structure;
- social problems (e.g. crime, ill-health, deprivation);
- human rights;
- community stress and conflict; integration, cohesion and alienation; and
- community character or image

7. Distributional effects:

Distributional analysis is a term used to describe the assessment of the impact of interventions on different groups in society. Interventions may have different effects on individuals according to their characteristics such as income level or geographical location, effects on specific groups in society (eg: by virtue of gender, age, religion, language, ethnicity and location); environmental justice.

Section 4: Useful Data Sources for Socio-Economic Impact Assessments

Name	Summary	Link to Source
Statistics.gov.scot	Contains a wide range of data by local authority and other geographic breakdowns. Has a search by subject and area option.	statistics.gov.scot
Marine Economic Statistics	Annual economic statistics publication including GVA and employment data for marine economy sectors.	Marine economic statistics - gov.scot (www.gov.scot)

Scottish Sea Fisheries Statistics	Provides data on the tonnage and value of all landings of sea fish and shellfish by Scottish vessels, all landings into Scotland, the rest of the UK and abroad, and the size and structure of the Scottish fishing fleet and employment on Scottish vessels.	Sea fisheries statistics - gov.scot (www.gov.scot)
Scottish Shellfish Farm Production Survey 2022	Statistics on employment, production and value of shellfish from Scottish shellfish farms.	Scottish Shellfish Farm Production Survey 2022 - gov.scot (www.gov.scot)
Scottish Annual Business Statistics 2020	Scottish Annual Business Statistics (SABS) presents estimates of employment, turnover, purchases, Gross Value Added and labour costs. Data are provided for businesses that operate in Scotland. Data are classified according to the industry sector, location and ownership of the business.	Scottish Annual Business Statistics 2020 - gov.scot (www.gov.scot)
Sub-Scotland Economic Statistics Database	The Sub-Scotland Economic Statistics Database provides economic, business, labour market and population data for Scotland, and areas within Scotland.	Sub-Scotland Economic Statistics Database - gov.scot (www.gov.scot)
Nomis Official Labour Market Statistics	Labour market statistics including data on employment, unemployment, qualifications, earnings etc.	Nomis - Official Labour Market Statistics (nomisweb.co.uk)
Economics of the UK Fishing Fleet 2020	Economic estimates at UK, home nation and fleet segment level for the UK fishing fleet. The estimates are calculated based on samples of fishing costs and earnings gathered by Seafish as part of the 2020 Annual Fleet Economic Survey.	Economics of the UK Fishing Fleet 2020 — Seafish
Scotland's Census, National Records of Scotland	Census data that provides information about the characteristics of people and households in the country.	Scotland's Census | National Records of Scotland (nrscotland.gov.uk)

Scottish Index of Multiple Deprivation	Collection of documents relating to the Scottish Index of Multiple Deprivation - a tool for identifying areas with relatively high levels of deprivation.	Scottish Index of Multiple Deprivation 2020 - gov.scot (www.gov.scot)
The Green Book	HM Treasury guidance on how to appraise and evaluation policies, projects and programmes.	The Green Book: appraisal and evaluation in central government - GOV.UK (www.gov.uk)
The Magenta Book	HM Treasury guidance on evaluation. Chapter 4 provides specific guidance on data collection, data access and data linking.	The Magenta Book - GOV.UK (www.gov.uk)
Enabling a Natural Capital Approach (ENCA)	Supplementary guidance to The Green Book. ENCA resources include data, guidance and tools to help understand natural capital and know how to take it into account.	Enabling a Natural Capital Approach (ENCA) - GOV.UK (www.gov.uk)

Section 5: Further sources of guidance:

HM Treasury guidance on how to appraise and evaluate policies, projects and programmes: The Green Book: appraisal and evaluation in central government

Best practice in Social Impact Assessment according to the International Association for Impact Assessment: Social Impact Assessment: Guidance for Assessing and Managing the Social Impacts of Projects

The project A two way Conversation with the People of Scotland on the Social Impacts of Offshore Renewables (CORR/5536) has developed elements of a conceptual framework on social values that can be used to support and inform existing processes for assessing the potential social impacts of offshore renewables plans: Offshore renewables - social impact: two way conversation with the people of Scotland

Best practice guidance for assessing the socio-economic impacts of OWF developments: Guidance on assessing the socio-economic impacts of offshore wind farms (OWFs)

A toolkit of methods available to assist developers, consultants, and researchers carrying out socio-economic impact assessments: Methods Toolkit for Participatory Engagement and Social Research - gov.scot (www.gov.scot)

Appendix II: Gap Analysis

Applicant to complete:

Consultee	No.	Point for Inclusion	EIA Report Section	Justification
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Corran Ferry Infrastructure Improvement Scheme

Appendix C.4: Scoping Opinion Response Table

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The Highland Council
Comhairle na Gàidhealtachd

Scoping Opinion Response Table

The Scoping Opinion Response Tables (Tables C.4.1 and C.4.2), detail how each of the points raised during the Environmental Impact Assessment (EIA) scoping process have been considered within the EIA Report (EIAR) and directs the reader to the relevant sections of the EIAR. Table C.4.1 outlines the points for inclusion prescribed by the Marine Directorate - Licensing Operations Team (MD-LOT) in their Scoping Opinion. Table C.4.2 outlines the points for inclusion prescribed by The Highland Council Planning Department ('THC Planning') in their Scoping Opinion.

The Scoping Report is provided in Appendix C.1 of the EIAR while the full scoping opinions, with consultee responses, are provided in Appendices C.2 and C.3.

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Table C.4.1: Summary of Scoping Responses – Marine Directorate Licensing Operations Team

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
The Scottish Ministers	2.3.1	The Scottish Ministers are aware the Applicant has sought a separate scoping opinion from The Highland Council for the associated onshore works. It is essential that the EIA Report concerning onshore works will be available at the time that the EIA Report for the Proposed Works is being considered so that all the information relating to the project as a 'whole' is presented. The EIA Report for the Proposed Works must consider the cumulative impacts with the onshore works.	A single Environmental Impact Assessment Report (EIAR) has been produced for both the onshore and offshore components of the Corran Ferry Infrastructure Improvement Scheme (CFIIS). Consequently, this EIAR concerning onshore and offshore works will be submitted to MD-LOT.	Refer Section 1 of Chapter 1: Introduction
The Scottish Ministers	2.3.2	The Scottish Ministers advise that the EIA Report must explicitly detail the licensable marine activities to be carried out below MHWS as part of the Proposed Works and identify which activities overlap with The Highland Council remit.	A detailed description of the licensable marine activities, and activities requiring to planning permission, are outlined in the project description of the EIAR.	Sections 2.4 and 2.5 of Chapter 2: Project Description
The Scottish Ministers	2.4.1	The Proposed works will require dredging of the seabed around the infrastructure to ensure sufficient water depth for unrestricted access in all tidal conditions. The Scottish ministers note that the Scoping Report does not detail the volume of dredge material or the consideration of a sea disposal site. The Applicant should consider the location of the dredge spoil disposal site and provide detailed sample plans for the dredge amount and area. The Scottish Ministers advise that consideration of the site disposal area and volume of the dredge material and dredge methodology should be included in the EIA report.	Dredge methodology and volumes are outlined in the project description of the EIAR. Disposal of dredge arisings is considered in the Best Practicable Environmental Option (BPEO) Report submitted with the marine licence application, including detailed sample plans. The report concludes the BPEO is a combination of re-use within the scheme and disposal to see at the Armadale Licenced dredge disposal site (HE030). Disposal at both these locations is considered within impact assessment.	Sections 2.5.1.9 and 2.5.1.10 of Chapter 2: Project Description CFIIS BPEO Report (Affric, 2025a)
The Scottish Ministers	2.4.2	The Scottish Ministers note that the Applicant proposes to use dredge material as infill in the land reclamation and potentially as rock armour. Any material unsuited to	See response to Item No. 2.4.1.	Sections 2.5.1.9 and 2.5.1.10 of Chapter

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
		these purposes is proposed to be deposited below MHWS. The Scottish Ministers advise that a worst case scenario must be assessed whereby all dredged material requires to be deposited at sea (subject to no contamination issues being found and a suitable deposit site being identified) and all of the infill material requires to be sourced from an alternative location and transported to site. The Applicant has indicated that a Best Practicable Environmental Option ("BPEO") will accompany any proposal to deposit dredged material at sea and this must clearly detail all options that have been considered and that any transport requirements have been assessed.		2: Project Description Sections 4.3.1, 4.3.2 and 4.3.3 of the CFIIS BPEO Report (Affric, 2025a) Section 20.6.1 of Chapter 20: Climate Change
The Scottish Ministers	2.4.3	The Scottish Ministers note the Applicant's intention to apply a 'Design Envelope' approach. Where the details of the Proposed Works cannot be defined precisely, the Applicant should ensure that they identify all licensable marine activities to be carried out below MHWS and apply a worst-case scenario for both construction and operations.	Since scoping, the proposal design has been finalised. This final proposal has been assessed in the EIAR. Details are provided in the project description and accompanying drawings. Where flexibility in construction methodology has been retained (e.g., the potential for blasting) a 'worst-case' scenario has been assessed.	Sections 2.4 and 2.5 of Chapter 2: Project Description
The Scottish Ministers	2.4.4	The Scottish Ministers advise that the Applicant must make every attempt to narrow the range of options. Where flexibility in the design envelope is required, this must be defined within the EIA Report and the reasons for requiring such flexibility clearly stated. At the time of application, the parameters of the Proposed Works should not be so wide-ranging as to represent effectively different projects. To address any uncertainty, the EIA Report must consider the potential impacts	Since scoping, the proposal design has been finalised. This final proposal has been assessed in the EIAR. Details are provided in the project description and accompanying drawings. Where flexibility in construction methodology has been retained (e.g., the potential for blasting) a 'worst-case' scenario has been assessed.	Sections 2.4 and 2.5 of Chapter 2: Project Description

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
		associated with each of the different scenarios. The criteria for selecting the worst case and the most likely scenario, together with the potential impacts arising from these, must also be described. The parameters of the Proposed Works must be clearly and consistently defined in the applications for the marine licences and the accompanying EIA Report.		
The Scottish Ministers	2.4.5	The Scottish Ministers will determine the applications based on the worst-case scenario. The EIA Report will reduce the degree of design flexibility required and the detail may be further refined in a Construction Method Statement ("CMS") to be submitted to the Scottish Ministers, for their approval, before works commence.	The EIAR presents the refined proposal, with some flexibility retained for construction. It is noted further refinement may be achieved through the submission of CMS to Scottish Ministers.	Sections 2.4 and 2.5 of Chapter 2: Project Description
The Scottish Ministers	2.4.6	It is a matter for the Applicant, in preparing the EIA Report, to consider whether it is possible to robustly assess a range of impacts resulting from a large number of undecided parameters. If the Proposed Works or any associated activities materially change prior to the submission of the EIA report, the Applicant may wish to consider requesting a new Scoping Opinion.	Since scoping, the proposal design has been finalised. This final proposal is within the bounds of the proposal presented for scoping and has been assessed in the EIAR. Hence, no new Scoping Opinion has been requested.	Sections 2.4 and 2.5 of Chapter 2: Project Description
The Scottish Ministers	2.4.7	The EIA Regulations require that the EIA Report include 'a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the Applicant, which are relevant to the Proposed Works and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects'.	A description and discussion of the reasonable alternatives studied for the proposal, and the design evolution process is detailed in the project description chapter.	Sections 2.3 of Chapter 2: Project Description

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
The Scottish Ministers	2.4.8	For the avoidance of doubt, the Scottish Ministers advise that the EIA Report must include an up-to-date consideration of the reasonable alternatives studied as the parameters of the Proposed Works have been refined. The Scottish Ministers expect this to comprise a discrete section in the EIA Report that provides details of the reasonable alternatives studied across all aspects of the Proposed Works and the reasoning for the selection of the chosen option(s), including a comparison of the environmental effects.	A description and discussion of the reasonable alternatives studied for the proposal, and the design evolution process is detailed in discrete sections of the project description chapter. Reasoning for the selection of the chosen options, including a comparison of the environmental effects is also provided.	Sections 2.3 of Chapter 2: Project Description
MD-LOT	3.2.1	Matters are not scoped out unless specifically addressed and justified by the Applicant and confirmed as being scoped out by the Scottish Ministers. The matters scoped out should be documented and an appropriate justification noted in the EIA report.	Matters scoped out of the EIAR are documented in the EIA methodology and address in the consultation sections of specific technical chapters where required.	Section 3.3 of Chapter 3: Methodology
MD-LOT	3.3.1	Any embedded mitigation relied upon for the purposes of the assessment should be clearly and accurately explained in detail within the EIA Report. The likely efficacy of the mitigation proposed should be explained with reference to residual effects. The EIA Report must identify and describe any proposed monitoring of significant adverse effects and how the results of such monitoring would be utilised to inform any necessary remedial actions.	Embedded mitigation is discussed in 'Primary and Tertiary Mitigation' sections within technical chapters of the EIAR. Secondary mitigation is outlined in detail where required, and subsequent residual effects assessed. Where proposed, monitoring is discussed as secondary mitigation within specific technical chapters.	Technical chapters of the EIAR: Chapters 5 – 20
MD-LOT	3.3.2	The EIA Report should clearly demonstrate how the Applicant has had regard to the mitigation hierarchy, including giving consideration to the avoidance of key receptors. The Scottish Ministers advise that where the mitigation is envisaged to form part of a management or mitigation plan, the EIA Report must set out these	The mitigation hierarchy is discussed in the design evolution narrative and within relevant technical chapters of the EIAR. Where required, mitigation in the form of monitoring and/or management plans are	Section 2.3 of Chapter 2: Project Description

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
		plans or the reliance on these in sufficient detail so the significance of the residual effect can be assessed and evaluated. This should also include identification of any monitoring and remedial actions (if relevant) in the event that predicted residual effects differ to actual monitored outcomes. Commitment to develop plans without sufficient detail is not considered to be suitable mitigation in itself.	outlined with appropriate detail to give confidence of adequate mitigation. This is discussed as secondary mitigation within specific technical chapters.	Technical chapters of the EIAR: Chapters 5 – 20
MD-LOT	3.3.3	The EIA Report must include a table of mitigation which corresponds with the mitigation identified and discussed within the various chapters of the EIA Report and accounts for the representations and advice attached in Appendix I.	Tables of mitigation, corresponding with the mitigation identified and discussed within the various chapters of the EIAR, is presented as Table 21.3.1 and Table 21.3.2. Note, these is titled 'Draft Schedule of Mitigation' as the direction of THC Planners (refer Item No. 5.2 of Table C.4.2).	Section 21.3 of Chapter 21: Project Description
MD-LOT	3.3.4	Where potential impact on the environment has been fully investigated but found to be of little or no significance, it is sufficient to validate that part of the assessment by detailing in the EIA Report, the work that has been undertaken, the results, what impact, if any, has been identified and why it is not significant.	The process of investigating and determining a non-significant effect is documented in technical chapters of the EIAR.	Technical chapters of the EIAR: Chapters 5 – 20
MD-LOT	5.1.1	This section contains the Scottish Ministers' opinion on whether the impacts identified in the Scoping Report are scoped in or out of the EIA Report. The Scottish Ministers advise that the representations from consultees and advice from MAU, MD-SEDD and TS must be considered in conjunction with the Scoping Opinion and with the expectation that recommendations and advice as directed through this Scoping Opinion are implemented.	Recommendations and advice as directed through this Scoping Opinion are implemented as outlined in line items below.	As outlined below

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
MD-LOT	5.2.2	The NatureScot representation highlights that rock blasting has the potential to affect receptors other than humans (e.g. birds, otters, marine mammals etc) and therefore onshore rock blasting must be scoped in for further assessment. The Applicant is directed to the NatureScot representation for further detail.	Onshore rock blasting is considered in Chapter 11: Terrestrial Ecology and Ornithology and Chapter 12: Marine Mammals as a disturbance effect on terrestrial protected species and marine mammals respectively.	Section 11.7.1.1 and 11.7.1.3 of Chapter 11: Terrestrial Ecology and Ornithology Section 12.7.1.1.4 of Chapter 12: Marine Mammals
MD-LOT	5.2.3	The Scottish Ministers broadly agree with the approach proposed in the Scoping Report to assess the potential impacts from in-air noise. However, the Scottish Ministers advise that blasting noise and vibration must be scoped in for the construction phase for further assessment in the EIA Report. The Scottish Ministers note the difficulty of assessing levels of blast noise prior to on-site testing and therefore advise a worst case approach is taken.	With regard to Item No. 5.2.2, blasting noise and vibration is considered in Chapter 11: Terrestrial Ecology and Ornithology and Chapter 12: Marine Mammals as a disturbance effect on terrestrial protected species and marine mammals respectively.	Section 11.7.1.1 and 11.7.1.3 of Chapter 11: Terrestrial Ecology and Ornithology Section 12.7.1.1.4 of Chapter 12: Marine Mammals
MD-LOT	5.3.2	NatureScot advised that dredging causes noise that can disturb marine mammals and must be considered further in the EIA Report. In addition, vessel movements should be scoped in for the construction and operational phases, as it is important all potential impacts are included and information to support assessment is produced. The Applicant is directed to the NatureScot representation for further detail.	Vessel movements and underwater noise from dredging are considered for both the construction and operational phases of the project for impacts on marine mammals.	Sections 12.7.1.1.1, 12.7.1.2 and 12.7.2 of Chapter 12: Marine Mammals
MD-LOT	5.3.3	The Scottish Ministers broadly agree with the approach for further assessment proposed in the Scoping Report but advise that dredging be scoped in for both phases	Vessel movements and underwater noise from dredging are considered for both the construction and operational phases of the project for impacts on marine mammals.	Sections 12.7.1.1.1, 12.7.1.2 and 12.7.2 of Chapter 12: Marine Mammals

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
		and vessel movements must be scoped in for both phases.		
MD-LOT	5.4.2	The Scottish Ministers agree with the approach for further assessment [with regard to air quality] proposed in the Scoping Report and with the elements to be scoped in and out of the EIA Report.	Noted.	Section 8.5 of Chapter 8: Air Quality
MD-LOT	5.5.2	The Scottish Ministers agree that geology, lands and soil can be scoped out of further assessment in the EIA Report.	Noted. No further assessment required.	Not applicable
MD-LOT	5.6.2	The Scottish Ministers agree that water quality can be scoped out of further assessment in the EIA Report.	Noted. No further assessment required.	Not applicable
MD-LOT	5.7.2	NatureScot advised it is content with the modelling method proposed to support the assessment on potential operational effects to coastal processes and with the elements to be scoped in and out of further assessment but highlight modelling must be complemented by expert geomorphological assessment. The Applicant is directed to the NatureScot representation in Appendix I for further information.	Coastal processes modelling has been complemented by expert geomorphological assessment as presented in the coastal processes and flooding chapter of the EIAR.	Section 9.3.2 and 9.6.2.1 of Chapter 9: Coastal Processes and Flooding
MD-LOT	5.7.3	The Scottish Ministers agree with the content and approach to the assessment of impacts on seabed, coastal processes and flooding proposed in the Scoping Report.	Noted.	Section 9.6 of Chapter 9: Coastal Processes and Flooding
MD-LOT	5.8.2	The Scottish Ministers agree with the proposed elements to be scoped in and out for further assessment [with regard to terrestrial ecology and ornithology] in the Scoping Report.	Noted.	Section 11.7 of Chapter 11: Terrestrial Ecology and Ornithology
MD-LOT	5.9.2	NatureScot advised that the Scoping Report outlines that seagrass beds, a Priority Marine Feature ("PMF"), are within 1km of the Proposed Works. However, the full	Seagrass beds have been considered in the benthic ecology assessment of the EIAR.	Sections 14.6.1.2 and 14.6.2.2 of Chapter 14: Benthic Ecology

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
		extent of seagrass beds has yet to be determined. The impact of dredging resulting in resuspension of sediment and siltation could impact the protected features. It's noted that seagrass beds have been scoped out of further assessment. The justification for scoping out the impact to seagrass must be supported by further information. The Applicant is directed to the NatureScot representation in Appendix I for further information.		
MD-LOT	5.9.3	The Scottish Ministers broadly agree with the approach for further assessment as proposed in the Scoping Report that benthic marine ecology is scoped in for both the construction and operational phases. The Applicant must engage with NatureScot to address their concerns regarding the need for further assessment of the potential impacts to seagrass beds from the Proposed Works.	Seagrass beds have been considered in the benthic ecology assessment of the EIAR. Emails were sent to NatureScot on 19th and 21st February 2025 communicating that as per NatureScot's advice, the patch of seagrass has been considered in the benthic ecology assessment (with specific regard to risk of sedimentation). NatureScot responded on 24th February 2025 stating they were content that seagrass being scoped in addresses their comment.	Sections 14.6.1.2 and 14.6.2.2 of Chapter 14: Benthic Ecology
MD-LOT	5.10.2	The NatureScot representation broadly agrees with the proposed approach to the assessment of the potential impacts on marine mammals but disagrees that dredging should be scoped out as the activity does cause noise that can disturb marine mammals. Similarly, it requires that vessel movements must be scoped in and must include any underwater noise related to the removal of existing structures and rock dumping for the new breakwater. Injury due to disposal at sea must be scoped in for both the construction and operational	On top of the impacts originally proposed to be scoped in, dredging and vessel movements, as well as underwater noise from rock dumping (placement) and removal of existing structures are considered in the EIAR. The potential effect of injury due to disposal at sea is assessed for both the construction and operational phases.	Sections 12.7.1.1.1, 12.7.1.2 and 12.7.2 of Chapter 12: Marine Mammals Sections 12.7.1.3 and 12.7.2.3 of Chapter 12: Marine Mammals

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
		phases. The Applicant is directed to the NatureScot representation for further detail.		
MD-LOT	5.10.3	The Scottish Ministers broadly agree with the approach for further assessment proposed in the Scoping Report. However, the Scottish Ministers advise that injury due to dredge disposal at sea is scoped in for both construction and operational phases. Similarly, vessel movements must also be scoped in for further assessment including any generated underwater noise.	See response to Item No. 5.10.2.	Sections 12.7.1.1.1, 12.7.1.2 and 12.7.2 of Chapter 12: Marine Mammals Sections 12.7.1.3 and 12.7.2.3 of Chapter 12: Marine Mammals
MD-LOT	5.11.2	The Scottish Ministers agree with the approach for further assessment proposed in the Scoping Report and the elements to be scoped in and out of the EIA Report [with regard to dish and shellfish ecology].	Noted.	Chapter 13: Fish and Shellfish Ecology
MD-LOT	5.12.2	The Scottish Ministers agree with the proposed content and approach to materials and waste and the elements to be scoped in and out of the EIA Report.	Noted.	Chapter 19: Materials and Waste
MD-LOT	5.13.2	The Scottish Ministers agree with the proposed content and approach in assessing landscape and visual effects and the elements to be scoped in and out of the EIA Report.	Noted.	Chapter 5: Landscape and Visual
MD-LOT	5.14.2	Historic Environment Scotland ("HES") identify two wreck sites, The Ness Queen and Craft the Moir, in the vicinity, but conclude that due to the shallow sediment and steep bathymetry in combination with the wooden construction and strong tides, it is unlikely the wrecks have survived in the area of the Proposed Works. The Applicant is directed to the Historic Environment Scotland representation for further detail.	Noted that it is unlikely the mentioned wrecks have survived in the area of the Proposed Works. Potential for wreck sites in the vicinity of the CFIIS are discussed the archaeology and cultural heritage chapter.	Section 15.5.3.2 of Chapter 15: Archaeology and Cultural Heritage

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
MD-LOT	5.14.3	The Scottish Ministers agree with the approach for further assessment as proposed in the Scoping Report and the elements to be scoped in and out of the EIA Report [with regard to archaeology and cultural heritage].	Noted.	Chapter 15: Archaeology and Cultural Heritage
MD-LOT	5.15.2	Transport Scotland advised that a full abnormal loads assessment be provided along with the EIA, that identifies key pinch points on the trunk road network, as well as swept path analyses to identify any required change to street furniture or structures along the route.	No abnormal loads are anticipated during the development.	
MD-LOT	5.15.3	The Scottish Ministers agree with the approach for further assessment proposed in the Scoping Report and advise that the Applicant addresses the Transport Scotland requirement to provide an abnormal loads assessment and swept path analysis with the EIA Report.	No abnormal loads are anticipated during the development.	
MD-LOT	5.16.2	The MCA advised that no elements of operation or construction with regards to shipping and navigation should be scoped out, pending the result of a Navigation Risk Assessment ("NRA") which is yet to be undertaken. The MCA recommends the development of a robust Safety Management System under the Port Marine Safety Code and a hazard identification workshop for the Proposed Works. The Applicant is directed to the MCA representation for further detail.	A hazard identification workshop was undertaken on 3rd October 2024 to inform the Navigational Risk Assessment. The Navigational Risk Assessment has been conducted in accordance with the latest editions of the Port Marine Safety Code and its Guide to Good Practice. The Navigational Risk Assessment concluded that all hazard scenarios identified through the process are assessed to be both tolerable and ALARP with the implementation of current controls and secondary mitigation.	Chapter 17: Navigation Appendix Q.1: Navigational Risk Assessment

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
			Subsequently, a significance assessment for navigational impacts is not required. Mitigation (i.e., risk controls) identified through the Navigational Risk Assessment have been captured within the EIAR for implementation during the construction and operational phase of the CFIIS. Risk controls applicable to the operational phase will be incorporated into THC's Corran Ferry Safety Management Systems prior to ferry operation taking place on the newly constructed infrastructure.	Chapter 21: Schedule of Mitigation
MD-LOT	5.16.3	In line with the representations of the MCA, the Scottish Ministers advise that all potential impacts identified in the navigation section (listed in Table 19.5.1) of the Scoping Report are scoped in for assessment in the EIA Report.	See response to Item No. 5.10.2.	Chapter 17: Navigation Appendix Q.1: Navigational Risk Assessment
MD-LOT	5.15.2	The Scottish Ministers agree with the assessment in the Scoping Report that the direct and indirect impact on jobs will be short-term, not significant in EIA terms and can be scoped out.	Noted. No further assessment required.	Not applicable
MD-LOT	5.15.3	The Scottish Minsters note the recommendation of the MAU that education, training and housing are scoped in and consider that these impacts can be addressed by the Applicant under the social effects on the local community section of the EIA Report, which they have advised will be scoped in.	Effects on education, training and housing are considered in the socio-economic chapter of the EIAR.	Section 18.7.3 of Chapter 18: Socio-economics

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
MD-LOT	5.15.4	The Scottish Ministers broadly agree with the approach for further assessment as proposed in the Scoping Report and recommend that further detail on the methodology and outcome of any social engagement should be included in the EIA. The Scottish Minsters direct the Applicant to the guidance supplied by the MAU for Socio-Economic Impact Assessment.	Further detail on the methodology and outcome of social engagement is presented in the socio-economic chapter of the EIAR.	Section 18.4 of Chapter 18: Socio-economics
MD-LOT	5.16.2	The Scottish Ministers draw attention to the MAU recommendation that the Applicant undertake engagement with local stakeholders to establish if consensus exists around the predicted level of impact on human health.	A comprehensive pre-application consultation process has been undertaken. Consensus from local stakeholders was that the CFIIS is not expected to have any significant effects on human health, but rather, discontinuation of the Corran Ferry service would have significant adverse effects. The Corran Ferry service provides an essential transport connection for peninsula communities to access healthcare, community services and their places of employment. Furthermore, the ferry connection provides a mean of social connectivity between these communities and the wider region. Discontinuation and even prolonged disruption of the service is expected to have a negative effect on community health and wellbeing. However, by maintaining and improving the service, the CFIIS itself will not result in any significant effects to human health.	CFIIS Pre-application Consultation Report (Affric Limited, 2025c)
MD-LOT	5.16.3	The Scottish Ministers agree that human health can be scoped out for further assessment in the EIA Report	See response to Item No. 5.16.2. No further assessment required.	Not applicable

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
		providing stakeholder engagement does not identify any concerns.		
MD-LOT	5.17.2	The Scottish Ministers are mindful that Greenhouse Gas ("GHG") emissions from all projects contribute to climate change. In this regard, the Scottish Ministers highlight the IEMA Environmental Impact Assessment Guide "Assessing Greenhouse Gas Emissions And Evaluating Their Significance" ("IEMA GHG Guidance"), which states that "GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as a such any GHG emissions or reductions from a project might be considered significant." The Scottish Ministers have considered this together with the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 and the requirement of the EIA Regulations to assess significant effects from the Proposed Works on climate. The Scottish Ministers therefore advise that the EIA Report must include a GHG Assessment which should be based on a Life Cycle Assessment ("LCA") approach and note that the IEMA GHG Guidance provides further insight on this matter. The Scottish Ministers highlight however that this should include the pre-construction, construction, operation and decommissioning phases, including consideration of the supply chain as well as benefits beyond the life cycle of the Proposed Works.	A GHG assessment has been undertaken using a Life Cycle Assessment approach within the climate change chapter of the EIAR. The assessment considers all phases of the proposed development, i.e., the construction (incorporating 'pre-construction'), operation and decommissioning phases. The assessment includes consideration of the supply chain as well as benefits beyond the life cycle of the Proposed Works.	Section 20.4, and 20.6 of Chapter 20: Climate Change
MD-LOT	5.17.3	The Scottish Ministers agree with the approach for further assessment as proposed in the Scoping Report.	Noted. See response to Item No. 5.17.2.	Chapter 20: Climate Change
MD-LOT	5.18.2	The Scottish Ministers note that no consultee comments were received on the topic of major accidents and	Noted. No further assessment required.	Not applicable

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
		disasters and agree that it can be scoped out from further assessment in the EIA report.		
MD-LOT	6.1.1	The EIA Report must be in accordance with the 2017 MW Regulations and the Scottish Ministers draw your attention in particular to, regulation 6. In accordance with the 2017 MW Regulations, the Scottish Ministers advise that the EIA Report must be based on this Scoping Opinion.	This EIAR has been completed in accordance with the 2017 MW Regulations and based upon the Scoping Opinion of Scottish ministers as outlined in this table.	Various sections of the EIAR Appendix C.4: Scoping Opinion Response Table
MD-LOT	6.1.2	A gap analysis template is attached at Appendix II to record the environmental concerns identified during the scoping process. This template should be completed and used to inform the preparation of the EIA Report. As part of the submission of the EIA Report the Scottish Ministers advise that Applicant must provide confirmation of how this Scoping Opinion is reflected in the EIA Report.	This table is structured in line with the template of Appendix II and has been included to provide confirmation of how this Scoping Opinion is reflected in the EIAR.	Appendix C.4: Scoping Opinion Response Table

Table C.4.2: Summary of Scoping Responses – The Highland Council Planning

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
THC Planning	1.1	The description of development for the EIAR must include: • a description of the physical characteristics of the whole development and the full land use requirements during the operational and construction phases; • a description of the main characteristics of the construction processes, for instance, nature and quantity of the materials used; • the risk of accidents, having regard in particular to substances or technologies used; • an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, heat, radiation, etc.) resulting from the operation of the development; and • the estimated cumulative impact of the project with other consented or operational developments. • A detailed schedule of mitigation.	This information has been included within the EIAR. A description of the development, including main characteristics of the construction processes is outlined in the project description. Nature and quantities of materials use are further detailed in the materials and waste chapter. Expected residues and emissions is discussed in various technical chapters of the EIAR. Cumulative impacts are also considered as outlined in the methodology chapter and addressed in technical chapters of the EIAR. A detailed schedule of mitigation is provided in Chapter 21: Schedule of Mitigation.	Sections 2.5 and 2.5 Chapter 2: Project Description Section 19.5 of Chapter 19: Materials and Waste Impact Assessment sections of topic chapters as applicable Section 3.7 of Chapter 3: Methodology Chapter 21: Schedule of Mitigation
THC	2.1	A statement is required which outlines the main development alternatives studied by the applicant and an indication of the main reasons for the final project choice. This is expected to highlight the following: • the range of technologies that may have been considered; • locational criteria and economic parameters used in site selection;	A description and discussion of the reasonable alternatives studied for the proposal, and the design evolution process is detailed in discrete sections of the project description chapter. Reasoning for the selection of the chosen options, including a comparison of the environmental effects is also provided.	Sections 2.3 of Chapter 2: Project Description

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
		• options for access; including construction laydown areas and staff / contractors' accommodation compounds; • design and locational options for all elements of the proposed development, and • the environmental effects of the different options examined. • The issues highlighted in Section 2.5 of the Scoping report should be included in detail.	Issues highlighted in Section 2.5 of the Scoping report (with regard to alternative crossing options) are discussed in Section 2.3 of the project description chapter of the EIAR.	Section 2.3 of Chapter 2: Project Description
THC	3.1	The EIAR must provide a description of the aspects of the environment likely to be significantly affected by the development. The following paragraphs highlight some principal considerations. The EIAR should fully utilise this understanding to ensure that information provided is relevant and robustly grounded.	Descriptions of environmental aspects with the potential to be impacted by the CFIIS are presented in the baseline sections of technical chapters of the EIAR.	Baseline sections of technical chapters 5-20
THC	3.3	The EIAR should recognise the existing land uses affected by the development having particular regard for THC's Development Plan inclusive of all statutorily adopted Supplementary Guidance (SG) and other Planning Advice Notes. The purpose of this chapter is to highlight relevant policies not to assess the compatibility of the proposal with policy. This will be in addition to the outline in Section 4.2 of the Scoping Report to identify relevant policies in individual topic sections.	Existing land use is presented as part of the background context and, where relevant, as part of the baseline in technical chapters of the EIAR. A table of how the CFIIS adheres to relevant policy is presented in the legislation and policy chapter of the EIAR, in addition to consideration given in the individual topic sections.	Section 2.1 of Chapter 2: Project Description Baseline sections of technical chapters 5-20 as applicable Table 4.3.1 of Chapter 4: Legislation and Policy

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THC	3.4	The Development Plan comprises the: • National Planning Framework 4 (NPF4) adopted in 2023 • Highland-wide Local Development Plan (HwLDP) adopted in 2012 • West Highland and Islands Local Development Plan (WestPlan) adopted in 2019 • Associated Supplementary Guidance • A list of the relevant polices was included in the PREAPP response.	Policies and documents highlighted in the Framework, local Development Plans and Supplementary Guidance have been included in the EIAR. Overarching policies are discussed in the legislation and policy chapter, policies relevant to ecological impact assessments are discussed in the biodiversity chapter and policies specific to EIA topics are discussed in the relevant technical chapters of the EIAR. A table of how the CFIIS adheres to policy is presented in the legislation and policy chapter of the EIAR.	Section 4.3.2 of Chapter 4: Legislation and Policy Policy and Guidance sections of technical chapters 5-20 as applicable Table 4.3.1 of Chapter 4: Legislation and Policy
THC	3.5	Applicants are advised to monitor the annual Development Plans Newsletter as this provides a timetable of work on the Highland development plan. The March 2024 Development Plans Newsletter is now available on the Council's website.	Consultation for the Highland Local Development Plan is now live. The new Plan is not expected to be adopted prior to submission of the application for planning permission.	Not applicable

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THC	3.6	Developer Contribution, Community Benefit & Community Wealth Building will all need to be considered as the scheme develops. With Developer Contributions sought in compliance with NPF4 Policy 18 (Infrastructure first), HwLDP Policy 31 (Developer Contributions) and Developer Contributions Supplementary Guidance (2018).	The CFIIS has developed in consideration of public and community benefit. As advised by THC's Planning Team Leader, developer contributions, if required, will be determined during the determination and consultation process post-application.	Not applicable
THC	3.7	The Council's Sustainable Design Guide Supplementary Guidance provides advice and guidance on a range of sustainability topics, including design, building materials and minimising environmental impacts of development. A Sustainable Design Statement would be required to support a future application.	A Sustainable Design Statement is submitted as part of the Design and Access Statement with the planning permission application.	CFIIS Design and Access Statement (Affric Limited, 2025b)
THC	3.9	It is noted that development plan policy relating to noise and disturbance have not been incorporated into Section 6.1 (e.g. NPF Policy 23 and Highland-wide LDP Policy 72).	Policy 23 of NPF4 and Policy 72 of Highland-wide LDP have been included in Section 6.2 of Chapter 6: In Air Noise and Vibration. A table of how the CFIIS adheres to policy is presented in the legislation and policy chapter of the EIAR.	Section 6.3.2 of Chapter 6: In Air Noise and Vibration Table 4.3.1 of Chapter 4: Legislation and Policy

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THC/ NatureScot	3.12	NatureScot has advised they note the possibility of some onshore rock blasting stated in section 6.3 however the decision has been reached to scope this out (section 6.6) on the basis that it will be managed via communication with residents. This assumes that onshore rock blasting will only affect humans depending on the scale/location of blasting. However, it has the potential to affect other receptors (birds, otters, marine mammals etc.). We would therefore advise including onshore rock blasting at this stage. Further discussion is required on this topic before agreement could be provided to scope out this topic.	Onshore rock blasting is considered in Chapter 11: Terrestrial Ecology and Ornithology and Chapter 12: Marine Mammals as a disturbance effect on terrestrial protected species and marine mammals respectively.	Section 11.7.1.1 and 11.7.1.3 of Chapter 11: Terrestrial Ecology and Ornithology Section 12.7.1.1.4 of Chapter 12: Marine Mammals
THC/ Contamination Land Officer	3.21	Based on the information set out in Chapter 9, and in accordance with the mitigation identified, it is agreed that the topic of geology, land and soils can be scoped out, however further supporting information may be required to satisfy the issue of potential land contamination.	Noted. As stated in Section 9.2.4 of the CFIIS Scoping Report, neither side of the Corran Narrows have a history that would suggest a likelihood of significant sources of pollutants that could have caused land contamination. Samples taken from the trial pits during the ground investigations did not identify any evidence of ground contamination.	Not applicable
THC/ NatureScot	3.24	NatureScot has commented as follows: "Section 11 of the Scoping Report (p60) acknowledges that changes to the seabed and/or to coastal processes could have knock-on effects on marine biodiversity. It is important to also acknowledge that there are no physical process receptors. This means that EIA assessment under this topic should consider only the impact Magnitude (the impact pathway) which can then be combined with Sensitivity in the Marine Biodiversity chapter of the EIA to produce a conclusion regarding impact significance.	The coastal processes chapter of the EIAR considers coastal processes in Loch Linnhe as a potential receptor of effects associated with the CFIIS. The outcome of the impact assessment on coastal processes is then used to inform the impact assessment for marine biodiversity.	Section 9.6 of Chapter 9: Coastal Processes and Flooding Section 12.7 of Chapter 12: Marine Mammals and Section 14.6 of

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
				Chapter 14: benthic Ecology
THC/Nature Scot	3.25	We agree with the scoping in and out proposed in Table 11.5.1 for the potential operational-phase effects of changes to coastal processes, we are content with the modelling method proposed to support the assessment. However, the modelling should be complemented by expert geomorphological assessment. In particular, there is clear evidence on aerial imagery that coastal sediment transport is predominantly north eastwards i.e. 'up-loch', so the likelihood of sediment being 'dammed' against the SW side of the new slipways and breakwater should be used as a 'sense check' of the modelling results.	Coastal processes modelling has been complemented by expert geomorphological assessment as presented in the coastal processes and flooding chapter of the EIAR.	Section 9.3.2 and 9.6.2.1 of Chapter 9: Coastal Processes and Flooding
THC/SEPA	3.26	SEPA advice previously given is reiterated – "As this location is upstream of the narrows, we would use the levels derived within the Caol and Lochyside Flood Study (as opposed to the CFB level which we are concerned underestimates the flood risk in this area due to observed levels in this area). The agreed coastal still water level is 4.69mAOD and the climate change (CC) allowance for the area is 0.86m so any new built development (which is not classed as essential infrastructure or water compatible use) should be on land above 5.55mAOD. We also recommend a 0.6m allowance for freeboard, and this would be a requirement for any development which is to be used for overnight accommodation, so on land above 6.15mAOD, or as a minimum using this for finished floor level (FFL)."	These levels have been incorporated as presented in the coastal processes and flooding chapter of the EIAR.	Section 9.4.3 of Chapter 9: Coastal Processes and Flooding

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THC/Nature Scot	3.31	NatureScot advises as follows – "The scoping document identifies possible connectivity between the proposal and Ardgour & Moidart Special Protection Area (SPA) and Glen Etive & Glen Fyne SPA. This is due to the presence of potential golden eagle foraging habitat within 1 km of the proposal site which is also within foraging range of the boundary of the SPA.	Noted. Refer response to Item No. 3.34 below.	Refer response to Item No. 3.34 below
THC/Nature Scot	3.32	Having checked the Golden Eagle Territory model, we can confirm there is predicted high usage areas of habitat within 1 km of the proposal. However, these areas are separated from the SPA by areas of unsuitable habitat.	Noted. Refer response to Item No. 3.34 below.	Refer response to Item No. 3.34 below
THC/Nature Scot	3.33	The territory centres of active SPA eagle territories are also at least 5 km from the proposal site. In addition, the main area of predicted eagle use is within 3 km of an active wider countryside golden eagle territory centre of the east of the proposal, meaning its use by SPA birds is unlikely. We therefore agree that the impacts on the SPAs are scoped in but an assessment is likely to conclude no adverse impact on site integrity.	Noted. Refer response to Item No. 3.34 below.	Refer response to Item No. 3.34 below
THC/Nature Scot	3.34	Information on and/or a survey to determine winter roost sites for golden eagles in the wider countryside territory to the east would allow mitigation to be put in place if birds are roosting on the western edge of that territory within 1 km of the proposal site.	Potential disturbance impacts on golden eagles (with regard to breeding and non-breeding territories) are assessed in the terrestrial ecology and ornithology chapter of the EIAR.	Section 11.7.1.1.4.7 and 11.7.2.2 of Chapter 11: Terrestrial Ecology and Ornithology
THC/Nature Scot	3.35	The scoping document also identifies potential connectivity to the Ben Nevis Site of Special Scientific Interest (SSSI) due to the presence of wintering snow buntings. Most of our wintering population of approx. 13,000 snow buntings breed in Greenland and Iceland with only 60-80 pairs breeding in the UK. It is likely that	Wintering snow buntings associated with the Ben Nevis Site of Special Scientific Interest are considered in the terrestrial ecology and ornithology chapter of the EIAR.	Section 11.5.1.8 of Chapter 11: Terrestrial Ecology and Ornithology

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		the wintering birds on the site are from the larger Greenland/Iceland population rather than being the local Ben Nevis SSSI birds. Suitable wintering habitat is also unlikely to be a limiting factor for wintering snow bunting as they can be very nomadic in response to weather and food availability. Habitat loss or disturbance is therefore unlikely to be significant even if some or all of the birds are from the Ben Nevis breeding population. We can therefore advise that connectivity and an adverse impact on the SSSI population of snow buntings is highly unlikely."		
THC/Nature Scot	3.39	Priority Marine Features (PMFs) - The proposal outlines that seagrass beds are within 1 km to the northwest of the proposal. The full extent of these seagrass beds has yet to be determined and NatureScot are aware of ongoing discussions regarding the seagrass beds at Ardgour and a potential community led restoration project. Seagrass beds have a high sensitivity to changes in siltation rate, this includes either light continuous sedimentation or a single deposition event (>5 cm) and a high sensitivity to changes in water clarity (FeAST). The impact of dredging resulting in resuspension of sediment and siltation could impact on the protected features. However, the project has scoped out the impact of the development on the seagrass beds due to size of the footprint (500 m). The justification for scoping out the impact to seagrass should be supported by further information on the distance/survey evidence from seagrass communities and the distance from sites of dredging and if there is a risk of interactions; modelling of the potential	Seagrass beds have been considered in the benthic ecology assessment of the EIAR.	Sections 14.6.1.2 and 14.6.2.2 of Chapter 14: Benthic Ecology

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		sedimentation from the development and on-going works (dredging). We therefore request further information on the justification/evidence for scoping out the impacts to seagrass communities identified in the EIA scoping report.		
THC/Nature Scot	3.43	We agree that rock stripping and blasting along with piling are scoped in. We disagree that dredging should be scoped out. This activity does cause noise that can disturb marine mammals and thus needs to be considered further. We note the intention to scope out vessel movements. Although we appreciate that the operational phase of the proposal will be largely the same, for the construction phase it is important that all potential impacts are included and information to support assessment produced. We would therefore advise that vessel movements is scoped in. This should include any underwater noise relating to removal of existing structures such as cutting and anything associated with rock dumping for the new breakwater.	In addition to the impacts originally proposed to be scoped in, dredging and vessel movements, as well as underwater noise from rock dumping (placement) and removal of existing structures are considered in the EIAR.	Sections 7.7.2, of Chapter 7: Underwater Noise Sections 12.7.1 and 12.7.2 of Chapter 12: Marine Mammals
THC/Nature Scot	3.44	We note the plan to include underwater noise and dredge disposal for the construction phase but scope out vessel and construction activity interaction. However, compliance with SMWWC is suggested in the report. We agree that vessel strikes are a low probability in this location and suggest that this could be covered in the Marine Mammal Protection Plan for completeness. Injury due to disposal at sea has been scoped out during the operations phase despite it having been scoped in for construction and the same risk having been highlighted in the accompanying text for maintenance dredging. We would therefore advise	All vessels will be required to follow the SMWWC, this requirements will be included in the Marine Mammal Species Protection Plan and other relevant sections of the CEMD associated with navigation. The potential effect of injury due to disposal at sea has been assessed for both the construction and operational phases.	Section 12.8.4 of Chapter 12: Marine Mammals Section 12.7.1.3 and 12.7.2.3 of Chapter 12: Marine Mammals

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		that this is scoped in for both construction and operation."		
THC/Nature Scot	3.45	Based on the information set out in Chapter 14 of the Scoping Report, and in accordance with the mitigation identified, it is agreed that the elements set out in Section 14.1.5 and 14.2.6 are scoped in and expanded to take in dredging and vessel movements as per NatureScot advice above.	In addition to the impacts originally proposed to be scoped in, dredging and vessel movements are considered in the EIAR.	Sections 12.7.1.1.1 and 12.7.1.2 of Chapter 12: Marine Mammals
THC	3.48	An additional viewpoint location recommended on the A861, further north than Viewpoint 5 at Rubha Deargh. It is a similar distance from the developments as Viewpoint 1, but with the Narrows more directly in the line of view for people travelling south. The location is within the Ardgour SLA at a point where uninterrupted views down the loch first open up.	A viewpoint on the A861 at Rubha Deargh has been included for landscape and visual assessment.	Section 5.9.3.2 of Chapter 5: Landscape and Visual
THC	3.49	It is noted that Policy 4 of NPF4 is not included in the policy section.	Policy 4 of NPF4 is discussed in the landscape and visual chapter of the EIAR. A table of how the CFIIS adheres to policy is presented in the legislation and policy chapter of the EIAR.	Section 5.5.1 of Chapter 5: Landscape and Visual Table 4.3.1 of Chapter 4: Legislation and Policy
THC/ THC's archaeologist	3.52	It is noted that Policy 7 of NPF4 is not included in the policy section.	Policy 7 of NPF4 is discussed in the archaeology and cultural heritage chapter.	Section 15.3.2.1 of Chapter 15: Archaeology and Cultural Heritage

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			A table of how the CFIIS adheres to policy is presented in the legislation and policy chapter of the EIAR.	Table 4.3.1 of Chapter 4: Legislation and Policy
THC/ THC's Transport Planning Team	3.55	"We note the intention to use the following rules as triggers for requiring further consideration of the environmental implications from traffic associated with the construction and operation of the new ferry facility: • Rule 1: Road links where traffic flows or HGV's increase by more than 30%. • Rule 2: Road links of high sensitivity where traffic flows or HGV's increase by more than 10%.	Noted. Refer response to Item No. 3.56 below.	Refer response to Item No. 3.56 below
THC/ THC's Transport Planning Team	3.56	To be clear, we would expect any sections of single-track public road with passing places to be deemed as high sensitivity and adhering with the requirements of Rule 2 above. This reflects how sensitive such routes are to changes in traffic flows and vehicle make-ups.	Noted. The section of the A861 which comprises a single track has been assessed as high sensitivity and adhering with the requirements of Rule 2. It should be noted that the section of the A861 which comprises single track road (through Ardgour village) will be upgraded to single carriageway in the area of the construction works (between proposed overnight pier and existing slipway) as part of the formalisation of this area of the foreshore. This is shown in drawing number 2387-WS-ZZ-AG-DR-C-2601.	Sections 16.4.2, 16.5.2 of Chapter 16: Traffic, Transport, and Access
THC/ THC's Transport Planning Team	3.57	The proposed Transport Assessment (TA) will need to demonstrate how the proposals adequately cater for bus priority and bus stop connectivity. We note that Highland Council Public Transport Team made comment during the Major Pre-Application process on the importance of the designs for the new Nether	Public transport proposals are outlined in Appendix P.1: Transport Assessment. A dedicated bus stop lane is provided as part of the proposals within the proposed marshalling area to facilitate the bypassing of traffic queues for the Ferry which is shown in Appendix P.1. It	Appendix P.1: Transport Assessment

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		Lochaber facility adequately catering for buses being able to bypass the traffic queues for the ferry. The proposals submitted in support of this submission don't appear to cater for that.	should be noted that during peak periods, the bus marshalling lane may be used by other vehicles which would be managed by THC shore-based staff, however, during times where buses are scheduled to service the bus stop, this would be avoided. The detailing of the Nether Lochaber marshalling area will also provide sufficient width to allow buses utilising the bus lane to turn and exit the Ferry Terminal to rejoin the A82 (T) should a bus stop be provided here in the future for bus services currently operating along the A82(T).	
THC/ THC's Transport Planning Team	3.58	They also made comment that new bus stops may be required on the A82(T) in the vicinity of the relocated ferry terminal. Any submission will need to demonstrate the adequacy of walking connectivity between serviced bus stops and the new Nether Lochaber ferry terminal.	It is not proposed that new bus stops will be provided along the A82 (T) in the vicinity of the relocated Ferry terminal as part of this application, nor are there proposals to relocate the existing bus stops on the A82(T). The bus stops along the A82 (T) are within a reasonable walking distance and time from the proposed CFIIS. It should also be noted that an improvement to the existing situation will be provided as part of the CFIIS as access will be available for all types of users – pedestrians, cyclists and wheelers. The existing path (Core Path LO20.04) from the slipway to the A82 (T) bus stops, via the A861, are at slopes of approximately 1:6 to 1:7 over a distance of 50 m, which is not appropriate for users with mobility issues, novice cyclists or people pushing prams. The access to the bus stops along the A82 (T) will therefore be an	Section 2.4.2.8 of Chapter 2: Project Description Appendix P.1: Transport Assessment

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			improvement on the existing situation. As noted above, provision has been made within the marshalling area to facilitate the turning of buses should it be required in the future.	
THC/ THC's Transport Planning Team	3.59	The submission appears to be suggesting that 1No. disabled car parking space will be provided at the car park serving the relocated Nether Lochaber facility. For the quantum of parking spaces proposed, this would require at least 2No. disabled parking spaces. Also, at least 1 of those spaces should be served by suitable electric vehicle (EV) charging facilities.	Two disabled parking spaces are proposed as part of the CFIIS, one of which will include EV charging facilities.	Section 2.4.2.5 of Chapter 2: Project Description
THC/ THC's Transport Planning Team	3.60	With regards to EV charging, it appears that Building (Scotland) Regulations require at least 50% of all car parking spaces incorporate suitable enabling infrastructure for the future installation of EV charging equipment. If so, any submission will need to demonstrate adherence with such requirements.	Provision for additional EV chargers to be installed in the future has been included in the CFIIS design, through the provision of additional ducting. The enabling infrastructure means that there is future provision for more than 50% of parking spaces to facilitate EV charging.	Section 2.4.2.5 of Chapter 2: Project Description
THC/ THC's Transport Planning Team	3.61	Similarly, the proposed TA and supporting layouts will need to clarify what facilities will be provided at the relocated Ardgour terminal to aid pedestrians and cyclists boarding and alighting the ferry service and justify their adequacy from a road safety and accessibility perspective.	A 2m wide painted footway will be provided on the new slipway which will provide a dedicated space for pedestrians accessing the ferry. At the head of the Ardgour Slipway the designated path leads to a shore area which currently includes a bicycle shelter and will be extended to include a shelter for pedestrians as they wait	Section 2.4.1.1 of Chapter 2: Project Description Appendix P.1 Transport Assessment

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			to be called forwards to the ferry. This will be provided on a footway, separated from the road.	
THC	3.62	In addition to the comments from Transport Planning, it is highlighted that the area proposed for construction compound on the Ardgour side has previously been found to have inadequate visibility onto the A861.	The junction will be temporarily widened to ensure appropriate visibility can be achieved during construction works. The junction will be reinstated post construction.	Section 2.5.1.1 of Chapter 2: Project Description
THC	3.63	It is noted that Policy 13 of NPF4 is not included in the policy section.	Policy 13 of NPF4 has been included in Section 16.3.1 of Chapter 16: Traffic, Transport, and Access. A table of how the CFIIS adheres to policy is presented in EIAR Chapter 4: Legislation and Policy.	Section 16.3.1 of Chapter 16: Traffic, Transport, and Access Table 4.3.1 of Chapter 4: Legislation and Policy
THC	3.66	It is noted that Policy 25 of NPF4 is not included in the policy section.	A table of how the CFIIS adheres to policy is presented in the legislation and policy chapter of the EIAR.	Table 4.3.1 of Chapter 4: Legislation and Policy
THC	3.69	It is noted that Policy 28 of the Highland wide Local Development Plan is not included in the policy section.	Policy 28 of the Highland-wide Local Development Plan has been included in the climate change chapter of the EIAR. A table of how the CFIIS adheres to policy is presented in the legislation and policy chapter of the EIAR.	Section 20.2.2.1 of Chapter 20: Climate Change Table 4.3.1 of Chapter 4: Legislation and Policy

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THC/ THC Forestry Officer	3.71	The Council's Forestry Officer has provided comments on the proposal and recommended a separate chapter on forestry – NPF Policy 6, Highland-wide LDP policies 51 and 52.	As was agreed with THC's Planning Team Leader on 11th December 2024, rather than present a separate chapter, the woodland north of Corran, as a forestry resource, will be assessed within the terrestrial ecology and ornithology chapter of the EIAR. NPF Policy 6, Highland-wide LDP policies 51 and 52 are outlined in the biodiversity chapter of the EIAR. A table of how the CFIIS adheres to policy is presented in the legislation and policy chapter of the EIAR.	Section 11.5.2 of Chapter 11: Terrestrial Ecology and Ornithology Appendix K.6: Corran Woodland Ecological Survey Sections 10.2.2.1 and 10.2.2.5 of Chapter 10: Biodiversity Table 4.3.1 of Chapter 4: Legislation and Policy
THC/ THC Forestry Officer	3.73	The applicant will need to provide a Forestry Chapter to the EIAR by a suitable consultant and the chapter will identify the location, type and condition of all woodland on and around the sites. The EIAR should provide a baseline survey of the trees and plants (including fungi, lichens and bryophytes) present on the site to determine the presence of any rare or threatened species.	Assessment of the woodland north of Corran, as a forestry resource, was undertaken by two suitably competent consultancies, Affric Limited and Nick Hodgetts Botanical Services. The assessment is presented in the terrestrial ecology and ornithology chapter of the EIAR. The assessment was supported by a baseline woodland survey (including bryophytes, lichens and fungi) with results presented in Appendix K.6.	Section 11.5.2 of Chapter 11: Terrestrial Ecology and Ornithology Appendix K.6: Corran Woodland Ecological Survey Report
THC/ THC Forestry Officer	3.74	The applicant should design the layout to minimise the impact on woodland as much as possible, especially native broadleaf woodland and woodland listed on the	The scheme design sought to minimise the development footprint within the native	Section 2.3.4.3 of Chapter 2: Project Description

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		Ancient Woodland Inventory AWI. Where that is not fully possible the applicant will need to provide robust justification for the need to develop a wooded site.	broadleaf woodland, and to retain as much of this woodland is practicable. No impacts will occur on woodland listed on the Ancient Woodland Inventory.	
THC/ THC Forestry Officer	3.75	The EIA Report should include Tree Constraints Plans and Tree Protection Plans to BS 5837:2012 to show how retained trees/woodland would be safeguarded from construction activity as well as a tree/woodland removal drawing which shows the extent of woodland that would need to be removed to accommodate new development.	A Tree Constraints Plans and Tree Protection Plans are provided with the application for planning permission submission. The plans show the extent of the woodland proposed for removal and how retained trees/woodland would be safeguarded from construction activity.	CFIIS Arboricultural Impact Assessment and Arboricultural Method Statement (Appendix K.7)
THC/ THC Forestry Officer	3.76	The applicant will also need to provide a Landscape Plan and Landscape Maintenance Plan which shows how trees to be removed are to be replaced with on-site planting and to show how the visual amenity of the local landscape is to be enriched.	A Landscape and Maintenance Plan (with accompanying Plantings Plans) are included in the supporting documents of the planning permission application with details of proposed mitigation planting to promote visual amenity of the permanent proposal. Refer response to Item No. 3.77 below with regard to replacement (compensation) planting.	CFIIS Landscape Planting and Maintenance Plan (Atmos Consulting, 2025) Refer response to Item No. 3.77 below

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THC/ THC Forestry Officer	3.77	Where woodland is proposed to be removed, compliance with the Scottish Governments Control of Woodland Removal policy must be demonstrated. Compensatory planting of new woodland is a clear expectation where there are any proposals for felling, and if necessary, this would need to be off-site.	Due to the limited land onsite, offsite compensation planting will be required. Offsite compensation planting of trees (required under the Scottish's Government's Policy on Control of Woodland Removal) will be combined with habitat creation for biodiversity enhancement. This was agreed with THC's Planning Team Leader on 23rd January 2025. Recognising biodiversity enhancement is relatively new in Scotland and implementation strategies are still evolving, it was agreed in consultation with the THC Planning Team Leader in December 2024 that biodiversity enhancement associated with the CFIIS will be addressed in a staged approach.	Section 10.2.2.1.1 of Chapter 10: Biodiversity
THC	4.1	Leading from the assessment of the environmental elements the EIAR needs to describe the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from: • the existence of the development; • the use of natural resources; and • the emission of pollutants, the creation of nuisances and the elimination of waste.	Likely significant effects are assessed in assessed in technical chapters of the EIAR. The general methodology of how the impact assessment is conducted for a given receptor is provided in the methodology chapter. Topic specific methodology is introduced in each relevant chapter.	Impact assessment sections of technical chapters 5 – 20 Section 3.5 of Chapter 3: Methodology and chapters 5 – 20 for topic specific details

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THC	4.2	The potential significant effects of development must have regard to: • the extent of the impact (geographical area and size of the affected population); • the trans-frontier nature of the impact; • the magnitude and complexity of the impact; • the probability of the impact; and • the duration, frequency and reversibility of the impact.	Refer to the response to Item No. 4.1 above.	Refer to the response to Item No. 4.1 above
THC	4.3	The effects of development upon baseline data should be provided in clear summary points.	Baseline data is presented in the 'Baseline' section in individual topic chapters. Potential effects upon baseline data, as determined through EIA scoping, are provided in clear points in the 'Impact Assessment' and summarised in a 'Summary of Effects' table in individual topic chapters. A summary of the significance assessment is included in the conclusion chapter of the EIAR.	Baseline and Impact Assessment sections of technical chapters 5-20 Table 22.1 of Chapter 22: Conclusion
THC	4.4	The Council requests that when measuring the positive and negative effects of the development a four-point scale is used advising any effect to be either strong positive, positive, negative or strong negative.	This EIAR defines a 'significant effect' in terms of EIA as equivalent to Strong Positive or Strong Negative as defined by THC. This was agreed through consultation with THC's Planning Team Leader on 11th December 2024.	Section 3.5.4 of Chapter 3: Methodology and Chapters 5 – 20 for topic specific details
THC	4.5	The applicant should provide a description of the forecasting methods used to assess the effects on the environment.	Effects on the environment are assessed as outlined in the methodology chapter and methodology sections of technical chapters in the EIAR.	Chapter 3: Methodology Methodology and Impact Assessment sections of technical chapters 5-20

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
THC	5.1	Consideration of the significance of any adverse impacts of a development will of course be balanced against the projected benefits of the proposal. Valid concerns can be overcome or minimised by mitigation by design, approach or the offer of additional features, both on and off site. A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment must be set out within the EIAR statement and be followed through within the application for development.	All measures envisaged to prevent, reduce and/or offset any significant adverse effects are presented in the primary and tertiary mitigation, and secondary mitigation sections of technical chapters in the EIAR. Clear summary tables (one for construction and one for operations) of all secondary mitigation measures associated with the development proposal, titled 'Draft Schedule of Mitigation' is presented in the schedule of mitigation chapter of the EIAR. This mitigation will be carried forward into a Construction Environmental Management Document (CEMD) (including CEMPs) which in turn will set the framework for individual CMS.	Chapters 5 – 20 for topic specific details Table 21.3.1 and 21.3.2 of Chapter 21: Schedule of Mitigation Section 21.3 of Chapter 21: Schedule of Mitigation
THC	5.2	The mitigation being tabled in respect of a single development proposal can be manifold. Consequently, the EIAR should present a clear summary table of all mitigation measures associated with the development proposal. This table should be entitled draft Schedule of Mitigation. As the development progresses to procurement and then implementation this carries forward to a requirement for a Construction Environmental Management Document (CEMD) and then Plan (CEMP) which in turn will set the framework for individual Construction Method Statements (CMS). Further guidance can be obtained here.	Refer response to Item No. 5.1 above.	Refer response to Item No. 5.1 above

Consultee	Item No.	Point for Inclusion	Justification (Incorporation within EIAR)	Section of EIAR
		This process is currently under review by a working party led by SEPA working through Heads of Planning Scotland but for the time being remains relevant.		
THC	5.3	The implementation of mitigation can often involve a number of parties other than the developer. In particular local liaison groups involving the local community are often deployed to assist with phasing of construction works – abnormal load deliveries, construction works to the road network, borrow pit blasting. It should be made clear within the EIAR or supporting information accompanying a planning application exactly which groups are being involved in such liaison, the remit of the group and the management and resourcing of the required effort.	The implementation of mitigation by parties other than the developer are highlighted in Table 21.3.1 and 21.3.2: Draft Schedule of Mitigation, with one for construction and one for operations. Engagement with the local community and local businesses will be undertaken by a dedicated Community Liaison Officer. No further management or resourcing is expected to be required.	Table 21.3.1 and 21.3.2 of Chapter 21: Schedule of Mitigation

References

Affric Limited, 2025a. CFIIS Best Practicable Environmental Option Report. Document reference: 99_REP_25.

Affric Limited, 2025b. CFIIS Design and Access Statement. Document reference: 99_REP_25.

Affric Limited, 2025c. CFIIS Pre-application Consultation Report. Document reference: 99_REP_20.

Atmos Consulting, 2025. CFIIS Landscape Planting and Maintenance Plan.

Corran Ferry Infrastructure Improvement Scheme

Appendix E.1: Landscape Character Types

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Appendix E.1 Landscape Character Types

Introduction

Using accepted, systematic methods of landscape character assessment, the landscape surrounding the Corran Ferry Infrastructure Improvement Scheme (CFIIS) has been subdivided into different landscape character types (LCTs), each with a distinctive character based upon local patterns of geology, land form, land use, cultural and ecological features. These provide baseline information which can be used to guide landscape change and provide a baseline against which to make judgements on the likely effects of the proposed development upon landscape character.

These datasets provide an assessment of the landscape character of the area, and consider the likely pressures and opportunities for change in the landscape. The relevant landscape character assessment is taken from the NatureScot web-based dataset, the 2019 Landscape Character Type map and associated Landscape Character Type Descriptions (NatureScot, 2024). The landscape character descriptions represent an accurate record of LCTs locally and have been used to guide the assessment of effects on landscape character types.

The following section describes the LCTs that coincide with the 5 km radius study area of the CFIIS. The descriptions and the assessment of sensitivity of the LCTs form the baseline to the assessment of effects on Landscape Character.

There are three LCTs within the detailed study area which have the potential to be affected by the proposed development, as identified through analysis of the Zone of Theoretical Visibility (ZTV) plans (Drawing Figures 5.2.1 and 5.2.2). The site is situated within the NatureScot LCT 234 - Lochs with Settled Edges.

The locations of the LCTs/Seascape Character Types (SCTs) within the detailed 5 km study area are shown on Drawing Figure 5.1.2.

Table E.1.1: Landscape Character Type 234: Lochs with Settled Edges

Location and Context
The Lochs with Settled Edges Landscape Character Type includes the inland sections of Loch Linnhe, Loch Leven and Loch Eil along the Great Glen. While these 'ribbon lochs', created by flooding of ice-scoured fault lines, are common in Lochaber, they are distinguished by their relatively high density of settlement, including farms and crofts, towns (including Fort William) and villages, and main road links.
Key Characteristics
• Flat landscape contained between steep loch sides and open water. • Extensive agriculture and settlement confined within a narrow lochside fringe, whose foreshore is subject to tidal influence. • Loch heads and river mouths that permit more extensive farming and built development, including housing and small industrial estates. • Communications confined to narrow loch edges where shingly beaches, rocky headlands, wooded banks and marshy platforms form a diverse water's edge. • Extensive tracts of oak-birch woodland climbing from the lochside up into the foothills, often engulfing the settled edge and providing an enclosed microlandscape.

- Dense commercial forests descend to loch shore in some locations.
- Occasional policy grounds of big houses along the loch edge give rise to a proliferation of rhododendron and other ornamentals in some places, providing a lush and sheltered character.
- Linearly arranged crofting communities with vivid green croft fields contrast with the more subdued duller colours of surrounding hills.

Landform

The Lochs with Settled Edges Landscape Character Type occupies a narrow fringe, squeezed between the loch edge and the steep hillsides, which prevailed after sea levels fell after the last Ice Age. It is usually enclosed by the Smooth Moorland Ridges landscape.

Landcover

Broadleaf woodland proliferates along some sections of loch edge and provides a sense of enclosure which contrasts with the expansive views across the loch. The Ballachulish slate quarries, once the most important in Scotland, remain prominent features in the landscape. Grazing land forms the context for much of the settlement of the area.

Landform

These areas encompass along their edges some of the principal settlements in Lochaber including Fort William and its suburbs of Caol, Corpach and Banavie; North Ballachulish and surrounding villages; and Kinlochleven, at the head of Loch Leven. The type also includes the major industrial areas in Fort William and Kinlochleven as well as core industrial estates. Remnants of the industrial planned villages of Ballachulish and Glen Coe are still visible amidst later housing. Between these centres, houses and crofts are scattered along the edge often set within grazing land. The spatial pattern of these pastures and crofts is distinctive along undeveloped sections of shoreline. The longevity of settlement in the area is evidenced by occasional prehistoric sites such as the fort of Cnocan Dubh and the archaeological features and artefacts discovered under the peat in North Ballachulish. Historic houses sit in prominent lochside landmark positions. Roads circumnavigate the loch edges along the settled strips or cut through rocky headlands where these penetrate to the water's edge. These often main roads are particularly busy in the summer months due to the high volume of tourist traffic.

Perception

The character of the loch edge is generally small-scale and diverse. The loch heads are sensitive in visual terms where views are channelled down lochs and their glens to them. Given its narrow spatial extent within the glen, the settled edge has a strong influence both on landscape character and on one's experience of it. Buildings are often white-washed, sometimes suburban in character, and stand out prominently against the hills and lochs and at night a string of lights seems to hang over dark loch waters. This landscape is frequently experienced amidst settlement when the detail and variety of built development along the loch edge is apparent and contrasts with the scale and homogeneity of the hillside and loch waters that enclose it. Views across the lochs to the opposite settled edges and hillsides above provide attractive visual detail.

Sensitivity

Value – High

Susceptibility – Medium

Overall Sensitivity – High

Table E.1.2: Landscape Character Type 236: Smooth Moorland Ridges

Location and Context
The Smooth Moorland Ridges Landscape Character Type comprises gently sloping hills which are mostly found alongside the wide glaciated valleys flanking much of the Great Glen in Lochaber.
Key Characteristics
• Gently undulating hills with smooth elongated ridge profiles, developing a more undulating landform in transitional areas with Rugged Massif - Lochaber. • Simple, large scale landscape pattern dictated by uniform landcover and uncomplicated landform. • Plateau summits generally draped in a mixture of grasses, heather and sedges, with exposed peat hags. • Large blocks of conifer forests along the hill sides and lower foothills. • Broadleaf woods on lower slopes and along loch edges, often framing crofts. • Scattered croft settlements with stone dykes concentrated on lower slopes, particularly along roads and south-facing slopes. • Roads and transmission lines following the base of the hills. • Smooth open slopes highly visible.
Landform
The character of the Smooth Moorland Ridges Landscape Character Type derives less from geology than from glacial action which has hewn a distinctive profile from the original, higher hills. The ridges, which are quite low-lying at 600-700 metres, may be recognised by their smooth undulating topography. They often occur as a transition into Rugged Massif - Lochaber, when the typically smooth edge begins to adopt a more rugged profile, and the boundary between Landscape Character Types may often be indistinct. A good example of such a transition occurs to the north of Loch Eil between Druim Fada and Beinn an t-Sneachda. The presence of dolerite and basalt dykes, formed by igneous intrusions, gives rise to indistinct parallel ridges along some slopes. Other more marked ridges within Glen Roy are known as 'Parallel Roads', and were formed by successive shore lines of a receding glacial lake.
Landcover
On the flat plateaux of the Smooth Moorland Ridges retention of rain water has led to the accumulation of peat, and the surfaces are riven with exposed peat hags (a hollow moss left after digging peat). The rounded hills support swathes of heather moorland which form a purple drape over some hills during the summer. The heather is often interspersed with a rough grass sward and, on lower slopes; small blocks of pasture are often associated with stone dykes and fences. Scrubby trees such as rowan and birch follow the burns and gullies which cut through the grain of the ridges and disrupt the smooth landform. Thicker growths of oak and birch wood occupy some lower slopes and loch edges such as Loch Arkaig and Loch Lochy. Coniferous forests also occur along the hillsides and, while generally avoiding ridgelines, often cover the lower foothills.
Settlement
There are occasional traditional stone croft dwellings and houses and hotels on the edges of the areas, especially along the southern banks of Loch Lochy. Remains of Medieval and post Medieval settlement and agriculture are widely dispersed along the banks of rivers.
Perception
This is a large scale landscape with simple landcover pattern giving it a uniform appearance. The smooth open slopes are highly visible.
Sensitivity

Value – Medium Susceptibility – High Overall Sensitivity – Medium/High

Table E.1.3: Landscape Character Type 238: Rugged Massif- Lochaber

Location and Context
Areas of Rugged Massif - Lochaber Landscape Character Type extend across Ardgour to the west of the study area.
Key Characteristics
• Rugged character, a crinkled skyline and a landform accentuated by rocky outcrops and glacial debris. • Large rocky masses drawing the eye upwards to ice-scoured rounded summits. • Often a transitional landscape with indistinct boundaries with other Landscape Character Types. • Often in remote, unsettled and inaccessible locations which, combined with the rugged relief, accentuates the wild character of these areas. • Thin soils supporting sparse cover of grasses and heather on higher, drier slopes. • Birch scrub and some oak woodland on lower slopes and within burn gullies and hanging valleys. • Extensive sheep and deer grazing with stalking and hill walking as popular activities. • Forestry occurring over small areas on flatter, lower slopes.
Landform
Areas of Rugged Massif – Lochaber Landscape Character Type are found extensively across Lochaber. It is a complicated landscape type both due to its underlying geology and its transitional character. It forms a transition between the lower, smoother hills of the Smooth Moorland Ridges and the higher, more mountainous Interlocking Sweeping Peaks - Lochaber. Rugged Massif - Lochaber occurs predominantly on the Moine group of metamorphic rocks, consisting of quartz, feldspar and granulite. Its deeply folded form, like so much of Lochaber, has been denuded by glacial action. Rounded masses of rock with an uneven, rugged landform and a craggy silhouette are littered with erratic's and other glacial debris. Deep narrow gullies form cracks in the terrain and other glacial features such as corries (typically facing north and north east) are abundant.
Landcover
Landcover Rocks protrude everywhere through thin, infertile soils which support a scant landcover of patchy grassland and heather supporting meagre grazing. Birch woods with occasional stands of oak, some remnants of ancient Caledonian forest, occur on the lower slopes or in gullies where a more sheltered aspect protects deeper richer soils from the persistent leaching by rain, and the steep slopes deter intense grazing.
Settlement
Built development and settlement are minimal, although remnants of shielings, charcoal burning platforms and early farming occur sporadically along loch sides and glens. Land masses tend to be rugged, remote and inaccessible with communication routes confined to lower lying glens. Isolated dwellings occur at the base of slopes.
Perception
The undeveloped, rugged and remoteness of this Landscape Character Type gives it very strong wild character.
Sensitivity

Value – Medium Susceptibility – High Overall Sensitivity – Medium/High

References

NatureScot, 2024. Digital map based Landscape Character Assessment. Available from: https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions

Corran Ferry Infrastructure Improvement Scheme

Appendix E.2: Seascape Character Types

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Appendix E.2 Seascape Character Type

Introduction

The NatureScot commissioned report 103, Commissioned Report No. 103, An assessment of the sensitivity and capacity of the Scottish seascape in relation to windfarms (Scott *et al.,* 2005), provides baseline information relevant to the study area. It was prepared to assess the seascape issues with regard to offshore wind energy developments, and provides a guide to the character and sensitivity of seascape units in Scotland.

The report defines seascape character around the Scottish coastline. Seascape character is made up of physical characteristics of hinterland, coast and sea plus a range of perceptual responses to the seascape, as well as visual aspects. Seascape sensitivity is defined as *'the measure of how vulnerable or robust seascape character is to change'*.

One Seascape Character Type is defined within the Corran Ferry Infrastructure Improvement Scheme study area, Type 9: Sounds, narrows and islands (Scott *et al.,* 2005) as illustrated on Drawing Figure 5.1.2. The following table sets out the main features, key characteristics and sensitivity of the Seascape Character Type to development of the type proposed.

Table E.2.1: Seascape Character Type 9: Sounds, Narrows and Islands

Physical characteristics
A deeply indented and fragmented coastline, with narrows and sounds strongly enclosed by islands and mainland. The coastline line is generally low and rocky and is often an 'incidental' feature, the focus being the narrow, elongated stretches of open water which act as a visual foil to often diverse landform of mountains and craggy islands. Settlement occurs along the narrow coastal edge of sheltered sea lochs. This type is backed occasionally by crofting land but mainly comprises moorland hills. Forestry occurs in places against coast with ancient woodlands found in more inaccessible narrows such as fjords. High mountain massif occurs close to coast and dramatically features in views. Views of islands tend to be the focus from the Mainland and vice versa, with mountain ridges being particularly arresting. The profiles of sea, islands and mountain ranges build up different contrasting layers which create an overall high scenic quality. The open sea is not generally obvious with views characteristically very contained in narrows and sounds and further broken by islands. Fish farming occurs in sheltered bays and the Sounds are important ferry routes between islands and the mainland.
Experiential qualities
This type forms a highly scenic seascape due to the variety of landscapes seen in views against the sea. Key ferry routes cross the sounds and give changing views of islands, mainland and sea. The sheltered waters of the sounds also attract sailors and scenic coastal road and rail routes e.g. Fort William to Mallaig are present. This type is not exposed to the open Atlantic being relatively calm and sheltered due to its inherent enclosure, however, views of mountains can often give it a dramatic character and it can feel remote in some of the more inaccessible narrows e.g. parts of Knoydart, Morvern and Loch Nevis.
Sensitivity
Value – Medium -High Susceptibility – High Overall Sensitivity – High

References

Scott, K.E., Anderson, C., Dunsford, H., Benson, J.F. and MacFarlane, R., 2005. An assessment of the sensitivity and capacity of the Scottish seascape in relation to offshore windfarms. Scottish Natural Heritage Commissioned Report No.103 (ROAME No. F03AA06)

Corran Ferry Infrastructure Improvement Scheme

Appendix E.3: Special Area Landscape Citation

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Appendix E.3 Special Landscape Area Citation

Introduction

One Special landscape Area (SLA) is identified within the 5 km study area of the Corran Ferry Infrastructure Improvement Scheme (CFIIS). This Technical Appendix sets out a summary description of Special Landscape Area 27, Ardgour, that lies immediately to the west of the proposed development and falls within areas of visibility.

The location of the SLA and its relationship to the CFIIS development site are illustrated in Drawing Figure 5.1.3 (the SLA is labelled in the figure as Local Landscape Area). Figures 5.2.1 and 5.2.2 show the SLA overlaid with ZTV mapping. The description of the SLA is taken from The Highland Council document, 'The Assessment of Highland Special Landscape Areas' (THC, 2011).

Table E.3.1: SLA 27: Ardgour

Overview
The Ardgour peninsula has a distinctive identity comprising rugged interior mountains contrasting with the wooded and sheltered shorelines of Loch Linnhe. Located on the quiet side of Loch Linnhe this area has an almost island sense of detachment even though it is part of the mainland. In the interior part of the SLA are the parallel east-west trending glens notable for their open space and native woodlands forming natural routeways through the mountains to Loch Shiel and Strontian.
Key Landscape and Visual Characteristics
• A distinct contrast of interior mountains, coast and glens with associated variation in scale, openness and enclosure. • Complex, high relief landform. • Rough mountainous interior with few roads and very sparse settlement. • Deep west-east orientated glens occur at regular intervals and these linear spaces have a strong feeling of enclosure and perspective. • Steep, interlocking peaks and ridges with a number of distinctive individual mountains. • Gentle, low-lying shoreline of bays, promontories, river mouths and marshy platforms, with a narrow patchwork of crofting land in stark contrast to the muted colours of the mountains and moorland. • Swathes of native broadleaf woodland and isolated areas of Scots Pine climb the lower slopes and burns rising from the lochside fringe softening the edge of the settlements here. • Areas of rhododendron and other ornamental species, associated with wooded policies and parkland create areas of contrasting settled character. • The complex and rugged landforms have a high proportion of exposed rock, seeming to pierce through a thin cover of grasses and heather. • The peninsular character is reinforced by the sense of remoteness and nature of arrival typically either by ferry or a long circuitous route. Roads tend to be single track, which means that the landscape tends to be experienced at a fairly slow speed when travelling through the area. • The roads follow loch sides and glens unveiling striking vistas where a strong visual rhythm of alternating containment and exposure is experienced through successive undulating landforms, woodland cover and open space. Lush coastal pastures around wide sweeping bays are interspersed with rugged sections where the hills squeeze the road close to the sea. • Throughout the area are scattered numerous shielings, abandoned buildings, farmsteads and the occasional township, and a number of prehistoric settlement remains.

- Views across the open waters of Loch Linnhe contrast with the looming presence of steep hills and ridges. Near the coast these two components of views are of similar scale which creates a balanced composition.
- Views to peaks and ridges from the lower ground are complemented by extensive panoramas from higher elevations and summits. This results in a strong contrast of experience from the hill tops to the coast and glens.

Special Qualities

Prominent Interlocking Peaks and Glens

- Steep, interlocking peaks and ridges with a number of distinctive individual mountains: Garbh Bheinn is one of Scotland's finest peaks and is distinguished by bold, bare rocky ridges, buttresses and gullies; Sgurr Dhomhnuill is the highest mountain in the area and is prominent from many locations; Sgurr na h-Eanchainne is a distinctive pointed hill above the Corran narrows and is prominent in many views along Loch Linnhe. The full grandeur of Garbh Bheinn is in fact best appreciated from a substantial distance away or from very close up. The mountain's impressive northeast face, nestling within an Alpine cirque, is invisible from the nearest roads and coast, those who patiently make the journey up the curving glen by foot are amply rewarded when the mountain face finally comes into view.
- Deep glens, including Glen Tarbert, Glen Gour, Glen Scaddle and Cona Glen, occur at regular intervals and with a similar orientation (east-west). They have a strong sense of enclosure with distant perspectives.
- The peninsular character is reinforced by the sense of remoteness and typical arrival by either ferry or a long circuitous, mainly single track, route which is the main through-route to Strontian and Ardnamurchan
- Prominent and distinctive peaks are visible from many locations, including from the A82 and A828 on the opposite side of Loch Linnhe. These peaks have well-defined summits, ridges and corries, and they are separated by deep, remote glens, of which only Glen Tarbert has a road. There is only sparse settlement at the seaward ends of these glens.

Semi–isolated, Peninsular Location

- The peninsular character of Ardgour is reinforced by the sense of remoteness and the typical mode of arrival in the area - by either the Corran ferry or via a long circuitous route. Roads tend to be single-track, which means that the landscape tends to be experienced at a fairly slow speed when travelling through the area.

Contrasts between Settled Shoreline and Imposing Hills

- Low-lying, open, and peaceful settled shorelines provide a marked contrast to the adjacent expanse of exposed and imposing mountains, moorland hills and water.
- Sheltered enclosure, and framed linear views provide a rich landscape experience when travelling through the area - either by road, track or footpath. On the coastal route particularly, the views both landward and seaward change significantly with progress northeast or south westwards.
- Views to the skylines of peaks and ridges from the lower ground and lochside are complemented by extensive and inspiring panoramas from higher elevations and summits, with striking compositions of mountains and sea-lochs.
- There is a dramatic stretch of road between Kilmalieu and Loch a' Choire. Here the edge of the land is so steep and unforgiving that the narrow, single-track road clinging to it seems to be a temporary presence rather than a permanent one. There are few, if any, road routes quite like this one elsewhere in the Highland region.

Sensitivity to change
The development of any structures, linear features, or significant new land use in the remote interior which would affect the sense of wildness, compromise the sense of open-ness or constitute distinct new features in themselves. • New structures or buildings on land or sea (or the enlargement of existing ones) which would obstruct or significantly detract from the quality of coastal vistas. • Structures which would visually connect the peninsula to the mainland and diminish the formers sense of detachment and remoteness. • Visitor interpretation and recreational facilities should be low-key
Potential for landscape enhancement
• Regeneration of native broadleaved woodland and restructuring of coniferous forest to benefit both habitat value and landscape and visual amenity. • Rationalise and improve the appearance of existing roads and associated roadside furniture including signage. • Rationalise/improve the siting and design of telecommunications infrastructure.

References

THC, 2011. Assessment of Highland Special Landscape Areas. Retrieved from: https://www.highland.gov.uk/downloads/file/2937/assessment_of_highland_special_landscape_areas.

Corran Ferry Infrastructure Improvement Scheme

Appendix F.1: Sound Pressure Meter Calibration Certificates

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CERTIFICATE OF CALIBRATION

Date of Issue: 13 July 2023 **Certificate Number: TCRT23/1515**

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory[Redacted]

K. Mistry

Customer	TNEI Floor 7 West One Forth Banks Newcastle upon Tyne NE1 3PA
Order No.	5001
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	00410234
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	10676
	Rion	Microphone	UC-59	18979
	Rion	Calibrator	NC-74	34536109
		Calibrator adaptor type if applicable		NC-74-002

Performance Class	1
Test Procedure	TP 10. SLM 61672-3:2013 *Procedures from IEC 61672-3:2013 were used to perform the periodic tests.*
Type Approved to IEC 61672-1:2013	Yes *If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013*
Date Received	12 July 2023 ANV Job No. TRAC23/07313
Date Calibrated	13 July 2023

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	Initial Calibration		

This certificate provides traceability of measurement to recognised national standards, and to units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

CERTIFICATE OF CALIBRATION

Certificate Number
TCRT23/1515

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-52/NL-42 Description for IEC 61672-1		
SLM instruction manual ref / issue	No. 56034 21-03	Source	Rion
Date provided or internet download date	19 March 2021		

	Case Corrections	Wind Shield Corrections	Mic Pressure to Free Field Corrections
Uncertainties provided	Yes	Yes	Yes

Total expanded uncertainties within the requirements of IEC 61672-1:2013	YES

Specified or equivalent Calibrator	Specified		
Customer or Lab Calibrator	Lab Calibrator		
Calibrator adaptor type if applicable	NC-74-002		
Calibrator cal. date	03 July 2023		
Calibrator cert. number	UCRT23/1863		
Calibrator cal cert issued by Lab	ANV Measurement Systems		
Calibrator SPL @ STP	93.99	dB	Calibration reference sound pressure level
Calibrator frequency	1002.01	Hz	Calibration check frequency
Reference level range	Single	dB	

Accessories used or corrected for during calibration - Extension Cable (No Wind Shield)
Note - The Extension Cable was used between the SLM and the pre-amp for this calibration.

Environmental conditions during tests	Start	End	
Temperature	24.13	23.87	± 0.30 °C
Humidity	38.5	37.2	± 3.00 %RH
Ambient Pressure	100.51	100.51	± 0.03 kPa

Indication at the Calibration Check Frequency				
Initial indicated level	94.2	dB	Adjusted indicated level	94.0 dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±				0.10 dB

Self Generated Noise				
Microphone installed -	Less Than	16.5	dB	A Weighting
Microphone replaced with electrical input device -				UR = Under Range indicated

Weighting	A			C			Z		
	11.4	dB	UR	15.5	dB	UR	20.4	dB	UR

Self Generated Noise reported for information only and not used to assess conformance to a requirement

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by ISO.

Additional Comments

None

…… END ……

Calibrated by: K. Zablocki

R 1

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 18 December 2023

Certificate Number: UCRT23/2584

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory [Redacted]

K. Mistry

Customer	TNEI 7th Floor West One Forth Banks Newcastle Upon Tyne NE1 3PA
Order No.	5001
Test Procedure	Procedure TP 1 Calibration of Sound Calibrators
Description	Acoustic Calibrator

Identification

Manufacturer	*Instrument*	*Model*	*Serial No.*
Rion	Calibrator	NC-74	34973250

The calibrator has been tested as specified in Annex B of IEC 60942:2003. As public evidence was available from a testing organisation (PTB) responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the class 1 requirements of IEC 60942:2003.

ANV Job No.	UKAS23/12850
Date Received	14 December 2023
Date Calibrated	18 December 2023

Previous Certificate

Dated	19 January 2023
Certificate No.	UCRT23/1090
Laboratory	0653

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Measurements

The sound pressure level generated by the calibrator in its WS2 configuration was measured five times by the Insert Voltage Method using a microphone as detailed below. The mean of the results obtained is shown below. It is corrected to the standard atmospheric pressure of 101.3 kPa (1013 mBar) using original manufacturers information.

Test Microphone	*Manufacturer*	*Type*
	Brüel & Kjær	4134

Results

The level of the calibrator output under the conditions outlined above was

94.01 ± 0.10 dB rel 20 µPa

Functional Tests and Observations

The frequency of the sound produced was	1002.88	±	0.12 Hz
The total distortion was	1.07	±	0.08 % Distortion

During the measurements environmental conditions were

Temperature	22	to	23	°C
Relative Humidity	36	to	45	%
Barometric Pressure	101.7	to	101.8	kPa

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

The uncertainties refer to the measured values only with no account being taken of the ability of the instrument to maintain its calibration.

A small correction factor may need to be applied to the sound pressure level quoted above if the device is used to calibrate a sound level meter which is fitted with a free-field response microphone. See manufacturers handbook for details.

..... END .....

Note:

Calibrator adjusted prior to calibration?	NO	
Initial Level	N/A	dB
Initial Frequency	N/A	Hz

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

Calibrated by: K. Zablocki

R 1

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 10 January 2024

Certificate Number: UCRT24/1051

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory [Redacted]

K. Mistry

Customer
TNEI Group
7th Floor West One
Forth Banks
Newcastle Upon Tyne
NE1 3PA

Order No. 5001

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	00386758
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	76908
Rion	Microphone	UC-59	12755
Rion	Calibrator	NC-75	34334830
	Calibrator adaptor type if applicable		NC-75-022

Performance Class 1

Test Procedure TP 10. SLM 61672-3:2013

Procedures from IEC 61672-3:2013 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2013 Yes

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013

Date Received 09 January 2024 ANV Job No. UKAS24/01022

Date Calibrated 10 January 2024

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	23 February 2022	TCRT22/1162	ANV Measurement Systems

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CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number
UCRT24/1051

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-52/NL-42 Description for IEC 61672-1			
SLM instruction manual ref / issue	No. 56034 21-03	Source	Rion	
Date provided or internet download date	19 March 2021			

	Case Corrections	Wind Shield Corrections	Mic Pressure to Free Field Corrections
Uncertainties provided	Yes	Yes	Yes

Total expanded uncertainties within the requirements of IEC 61672-1:2013	YES		
Specified or equivalent Calibrator	Specified		
Customer or Lab Calibrator	Lab Calibrator		
Calibrator adaptor type if applicable	NC-75-022		
Calibrator cal. date	18 December 2023		
Calibrator cert. number	UCRT23/2596		
Calibrator cal cert issued by Lab	0653		
Calibrator SPL @ STP	94.01	dB	Calibration reference sound pressure level
Calibrator frequency	1000.00	Hz	Calibration check frequency
Reference level range	Single	dB	

Accessories used or corrected for during calibration - None

Environmental conditions during tests	Start	End	
Temperature	23.46	23.32	± 0.30 °C
Humidity	31.5	31.8	± 3.00 %RH
Ambient Pressure	102.03	102.03	± 0.03 kPa

Indication at the Calibration Check Frequency				
Initial indicated level	94.2 dB	Adjusted indicated level	94.0	dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±			0.10	dB

Self Generated Noise

Microphone installed - Less Than 22.1 dB A Weighting

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	11.7	dB	UR	16.3	dB	UR	21.2	dB	UR

Self Generated Noise reported for information only and not used to assess conformance to a requirement

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

..... END .....

Calibrated by: C. Hirlav

R 3

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 03 January 2024

Certificate Number: UCRT24/1015

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory [Redacted]

K. Mistry

Customer	TNEI 7th Floor West One Forth Banks Newcastle Upon Tyne NE1 3PA
Order No.	5001
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	00386760
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	76910
Rion	Microphone	UC-59	12778
Rion	Calibrator	NC-75	34334830
	Calibrator adaptor type if applicable		NC-75-022

Performance Class 1

Test Procedure TP 10. SLM 61672-3:2013

Procedures from IEC 61672-3:2013 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2013 Yes

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013

Date Received 22 December 2023 ANV Job No. UKAS23/12871

Date Calibrated 03 January 2024

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	23 February 2022	TCRT22/1161	ANV Measurement Systems

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CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number
UCRT24/1015

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-52/NL-42 Description for IEC 61672-1		
SLM instruction manual ref / issue	No. 56034 21-03	Source	Rion
Date provided or internet download date	19 March 2021		

	Case Corrections	Wind Shield Corrections	Mic Pressure to Free Field Corrections
Uncertainties provided	Yes	Yes	Yes

Total expanded uncertainties within the requirements of IEC 61672-1:2013	YES		
Specified or equivalent Calibrator	Specified		
Customer or Lab Calibrator	Lab Calibrator		
Calibrator adaptor type if applicable	NC-75-022		
Calibrator cal. date	18 December 2023		
Calibrator cert. number	UCRT23/2596		
Calibrator cal cert issued by Lab	0653		
Calibrator SPL @ STP	94.01	dB	Calibration reference sound pressure level
Calibrator frequency	1000.00	Hz	Calibration check frequency
Reference level range	Single	dB	

Accessories used or corrected for during calibration - None

Environmental conditions during tests	Start	End	
Temperature	22.73	22.76	± 0.30 °C
Humidity	46.6	47.7	± 3.00 %RH
Ambient Pressure	97.78	97.77	± 0.03 kPa

Indication at the Calibration Check Frequency			
Initial indicated level	94.3 dB	Adjusted indicated level	94.0 dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±			0.10 dB

Self Generated Noise

Microphone installed - Less Than 20.2 dB A Weighting

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	10.7	dB	UR	14.8	dB	UR	20.1	dB	UR

Self Generated Noise reported for information only and not used to assess conformance to a requirement

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

..... END .....

Calibrated by: K. Zablocki

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 03 January 2024 **Certificate Number: UCRT24/1019**

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory [Redacted]

K. Mistry

Customer
TNEI
7th Floor West One
Forth Banks
Newcastle Upon Tyne
NE1 3PA

Order No. 5001
Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator
Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	00386761
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	76911
Rion	Microphone	UC-59	12788
Rion	Calibrator	NC-75	34334830
	Calibrator adaptor type if applicable		NC-75-022

Performance Class 1
Test Procedure TP 10. SLM 61672-3:2013
Procedures from IEC 61672-3:2013 were used to perform the periodic tests.
Type Approved to IEC 61672-1:2013 Yes
If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013
Date Received 22 December 2023 ANV Job No. UKAS23/12873
Date Calibrated 03 January 2024

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	23 February 2022	TCRT22/1158	ANV Measurement Systems

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CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number
UCRT24/1019

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-52/NL-42 Description for IEC 61672-1		
SLM instruction manual ref / issue	No. 56034 21-03	Source	Rion
Date provided or internet download date	19 March 2021		

	Case Corrections	Wind Shield Corrections	Mic Pressure to Free Field Corrections
Uncertainties provided	Yes	Yes	Yes

Total expanded uncertainties within the requirements of IEC 61672-1:2013	YES		
Specified or equivalent Calibrator	Specified		
Customer or Lab Calibrator	Lab Calibrator		
Calibrator adaptor type if applicable	NC-75-022		
Calibrator cal. date	18 December 2023		
Calibrator cert. number	UCRT23/2596		
Calibrator cal cert issued by Lab	0653		
Calibrator SPL @ STP	94.01	dB	Calibration reference sound pressure level
Calibrator frequency	1000.00	Hz	Calibration check frequency
Reference level range	Single	dB	

Accessories used or corrected for during calibration - None

Environmental conditions during tests	Start	End	
Temperature	22.71	22.29	± 0.30 °C
Humidity	55.5	51.2	± 3.00 %RH
Ambient Pressure	97.91	97.98	± 0.03 kPa

Indication at the Calibration Check Frequency				
Initial indicated level	94.1	dB	Adjusted indicated level	94.0 dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±				0.10 dB

Self Generated Noise

Microphone installed - Less Than 19.7 dB A Weighting

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	11.3	dB	UR	15.5	dB	UR	20.7	dB	UR

Self Generated Noise reported for information only and not used to assess conformance to a requirement

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

..... END .....

Calibrated by: K. Zablocki

R 1

CERTIFICATE OF CALIBRATION

Date of Issue: 13 July 2023 **Certificate Number: TCRT23/1514**

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory [Redacted]

K. Mistry

Customer	TNEI Floor 7 West One Forth Banks Newcastle upon Tyne NE1 3PA
Order No.	5001
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	00410237
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	10679
Rion	Microphone	UC-59	19119
Rion	Calibrator	NC-74	34536109
	Calibrator adaptor type if applicable		NC-74-002

Performance Class 1

Test Procedure TP 10. SLM 61672-3:2013

Procedures from IEC 61672-3:2013 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2013 Yes

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013

Date Received 12 July 2023 ANV Job No. TRAC23/07313

Date Calibrated 13 July 2023

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	Initial Calibration		

This certificate provides traceability of measurement to recognised national standards, and to units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

CERTIFICATE OF CALIBRATION

Certificate Number
TCRT23/1514

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-52/NL-42 Description for IEC 61672-1		
SLM instruction manual ref / issue	No. 56034 21-03	Source	Rion
Date provided or internet download date	19 March 2021		

	Case Corrections	Wind Shield Corrections	Mic Pressure to Free Field Corrections
Uncertainties provided	Yes	Yes	Yes

Total expanded uncertainties within the requirements of IEC 61672-1:2013	YES

Specified or equivalent Calibrator	Specified		
Customer or Lab Calibrator	Lab Calibrator		
Calibrator adaptor type if applicable	NC-74-002		
Calibrator cal. date	03 July 2023		
Calibrator cert. number	UCRT23/1863		
Calibrator cal cert issued by Lab	ANV Measurement Systems		
Calibrator SPL @ STP	93.99	dB	Calibration reference sound pressure level
Calibrator frequency	1002.01	Hz	Calibration check frequency
Reference level range	Single	dB	

Accessories used or corrected for during calibration - Extension Cable (No Wind Shield)
Note - The Extension Cable was used between the SLM and the pre-amp for this calibration.

Environmental conditions during tests	Start	End	
Temperature	23.80	23.70	± 0.30 °C
Humidity	38.7	35.9	± 3.00 %RH
Ambient Pressure	100.56	100.51	± 0.03 kPa

Indication at the Calibration Check Frequency				
Initial indicated level	94.3	dB	Adjusted indicated level	94.0 dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±				0.10 dB

Self Generated Noise

Microphone installed - Less Than 18.3 dB A Weighting

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	11.6	dB	UR	16.3	dB	UR	21.2	dB	UR

Self Generated Noise reported for information only and not used to assess conformance to a requirement

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by ISO.

Additional Comments

None

…… END ……

Calibrated by: C. Hirlav

R 3

Corran Ferry Infrastructure Improvement Scheme

Appendix F.2: Noise Monitoring Field Data Sheets

Field Data Sheet - NML1

Project Title	Corran Ferry	**Project Number**	16015
Client	Affric	**Surveyor**	MR/WC

MONITORING LOCATION

Location Number	NML1
Location Name	No.1 Corran Gardens
Description	Positioned in the front yarrd of No.1, selected to represent receptors on the east side of the A82. Equipment located >3.5m from nearby facades or reflective surfaces.
Eastings	202382
Northings	763564
Noise sources noted during installation, weekly inspection and removal	The weather at time of installation was windy, with some light rain. Wind induced noise could be heard from the foilage. The dominant sources of noise was from the road and the wind.

NOISE MONITORING EQUIPMENT DETAILS

	Number	Model	Serial Number	Last Calibrated/ Conformance Checked
Sound Level Meter	SLM 51	NL52	00410237	13/07/2023
Calibrator	CAL 2	NC74	34973250	18/12/2023

Weather Measurement	None
Equipment Notes	

NOISE MONITORING EQUIPMENT SETTINGS

	Frequency Weighting	Index	Interval	Time Weighting	Range (Hz)	Audio Recording
Parameters Recorded	A	Leq, L90	15 Mins	Fast	20-110	No

DATA

File Name	Start Time	End Time	Cal. at Start (dB)	Cal. at End (dB)	Drift (dB)	Observations
101	2024-08-13 12:00:00	2024-08-27 12:04:00	94.0	93.8	-0.2	A relatively quiet location in comparison to receptors closer to the road. The street is more sheltered from the wind so wind induced noise is lessened. Road noise much more prominent and dominant on a fair weather day but currently wind noise/road noise are about equal.

NML1 PHOTOGRAPHS

North	East
South	**West**

Field Data Sheet - NML2

Project Title	Corran Ferry	**Project Number**	16015
Client	Affric	**Surveyor**	MR/WC

MONITORING LOCATION

Location Number	NML2
Location Name	North Corran Beag Home
Description	The kit was positioned at North Corran Beag House as it is one opf the closest receptor to the proposed CFIIS. The kit was placed in the front garden of the amenity area. Equipment located >3.5m from nearby facades or reflective surfaces.
Eastings	202281
Northings	763692
Noise sources noted during installation, weekly inspection and removal	The weather at time of installation was windy, with heavy rain. Wind induced noise could be heard from the foilage. The dominant sources of noise was from the road and the wind.

NOISE MONITORING EQUIPMENT DETAILS

	Number	Model	Serial Number	Last Calibrated/ Conformance Checked
Sound Level Meter	SLM 47	NL52	00386760	03/01/2024
Calibrator	CAL 2	NC74	34973250	18/12/2023

Weather Measurement	None
Equipment Notes	

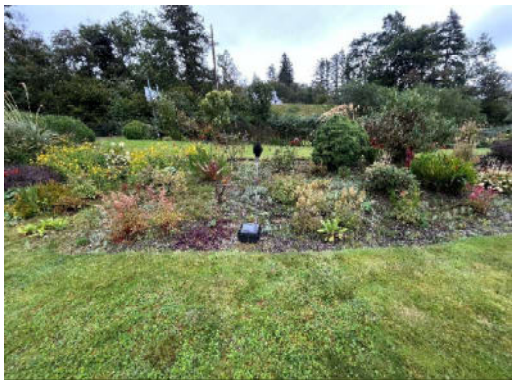
NOISE MONITORING EQUIPMENT SETTINGS

	Frequency Weighting	Index	Interval	Time Weighting	Range (Hz)	Audio Recording
Parameters Recorded	A	Leq, L90	15 Mins	Fast	20-110	No

DATA

File Name	Start Time	End Time	Cal. at Start (dB)	Cal. at End (dB)	Drift (dB)	Observations
201	2024-08-13 12:45:00	2024-08-27 11:26:00	94.0	93.7	-0.3	The weather at time of collection was windy, which producedthe dominant noise from wind in foilage. The traffic from the A82 road was audible. The ferry alarm could be heard from the Nether Lochaber slipway.

NML2 PHOTOGRAPHS

North	East
	
South	**West**

Field Data Sheet - NML3

Project Title	Corran Ferry	**Project Number**	16015
Client	Affric	**Surveyor**	MR/WC

MONITORING LOCATION

Location Number	NML3
Location Name	Birchbrae
Description	The kit was located in a field near houses, in Bunree. This location was chosen to represent receptors in Bunree. Equipment located >3.5m from nearby facades or reflective surfaces.
Eastings	202029
Northings	763032
Noise sources noted during installation, weekly inspection and removal	The majority of noise was from the wind, with wave noise alos being audbile. No noise from the drainage ditch could be heard at the time which was considered in spate. The weather was cloudle with some light rain.

NOISE MONITORING EQUIPMENT DETAILS

	Number	Model	Serial Number	Last Calibrated/ Conformance Checked
Sound Level Meter	SLM 48	NL52	00386761	03/01/2024
Calibrator	CAL 2	NC74	34973250	18/12/2023

Weather Measurement	Rain Gauge 7
Equipment Notes	Kestrel also placed here, and chained to noise kit.

NOISE MONITORING EQUIPMENT SETTINGS

	Frequency Weighting	Index	Interval	Time Weighting	Range (Hz)	Audio Recording
Parameters Recorded	A	Leq, L90	15 Mins	Fast	20-110	No

DATA

File Name	Start Time	End Time	Cal. at Start (dB)	Cal. at End (dB)	Drift (dB)	Observations
301	2024-08-13 12:00:00	2024-08-27 11:34:00	94.0	93.9	-0.1	Sound scape is the same except foliage noise is more pronounced and the road noise from the A82 is inaudible. Drain close to kit, audible when walking past but not from install location.

NML3 PHOTOGRAPHS

North	East
South	**West**

Field Data Sheet - NML4

Project Title	Corran Ferry	**Project Number**	16015
Client	Affric	**Surveyor**	MR/WC

MONITORING LOCATION

Location Number	NML4
Location Name	Corran Point Lighthouse
Description	The kit was located at Corran Point Lighthouse, within the garden. Equipment located >3.5m from nearby facades or reflective surfaces.
Eastings	201688
Northings	763525
Noise sources noted during installation, weekly inspection and removal	The soundscape consisted of occasional road noise from the nearby road, and notably quieter then Nether Lochaber side of the Narrows. The main noise source was from wind in foilage, but the garden walls provided some shelter.

NOISE MONITORING EQUIPMENT DETAILS

	Number	Model	Serial Number	Last Calibrated/ Conformance Checked
Sound Level Meter	SLM 45	NL52	00386758	10/01/2024
Calibrator	CAL 2	NC74	34973250	18/12/2023

Weather Measurement	Rain Gauge 1
Equipment Notes	

NOISE MONITORING EQUIPMENT SETTINGS

	Frequency Weighting	Index	Interval	Time Weighting	Range (Hz)	Audio Recording
Parameters Recorded	A	Leq, L90	15 Mins	Fast	20-110	No

DATA

File Name	Start Time	End Time	Cal. at Start (dB)	Cal. at End (dB)	Drift (dB)	Observations
401	2024-08-13 14:45:00	2024-08-27 12:51:00	94.0	93.9	-0.1	The weather at the time of collection was very windy, overcast, with light rain and approximately 15°c. Wind and wind induced noise was dominant. Water on shore of Loch audible, as well as the ferry beacon at the ardgour port. The residents dog barking inside could also be heard.

NML4 PHOTOGRAPHS

North	East
South	**West**

Field Data Sheet - NML5

Project Title	Corran Ferry	**Project Number**	16015
Client	Affric	**Surveyor**	MR/WC

MONITORING LOCATION

Location Number	NML5
Location Name	Ferry Office
Description	The kit was located at the far side of the Ferry Office back garden. This located was chosen to represent receptors nearby the Inn and North Corran. Equipment located >3.5m from nearby facades or reflective surfaces.
Eastings	201688
Northings	763525
Noise sources noted during installation, weekly inspection and removal	Dominant noise is wind in foliage. Occasional road noise but not very audible at time of install. Ferry alarm going off in distance due to docking.

NOISE MONITORING EQUIPMENT DETAILS

	Number	Model	Serial Number	Last Calibrated/ Conformance Checked
Sound Level Meter	SLM 52	NL52	00410234	13/07/2023
Calibrator	CAL 2	NC74	34973250	18/12/2023

Weather Measurement	None
Equipment Notes	

NOISE MONITORING EQUIPMENT SETTINGS

	Frequency Weighting	Index	Interval	Time Weighting	Range (Hz)	Audio Recording
Parameters Recorded	A	Leq, L90	15 Mins	Fast	20-110	No

DATA

File Name	Start Time	End Time	Cal. at Start (dB)	Cal. at End (dB)	Drift (dB)	Observations
501	2024-08-13 15:15:00	2024-08-27 12:37:00	94.0	93.6	-0.4	At the time of kit collection, there was a lot of wind and wind induced noise. Foliage rustle was the dominant noise source, and the ferry warning alarm was audible. Some noise from waves breaking at the shoreline.

NML5 PHOTOGRAPHS

North	East
South	**West**

Corran Ferry Infrastructure Improvement Scheme

Appendix F.3: Time Series Graphs

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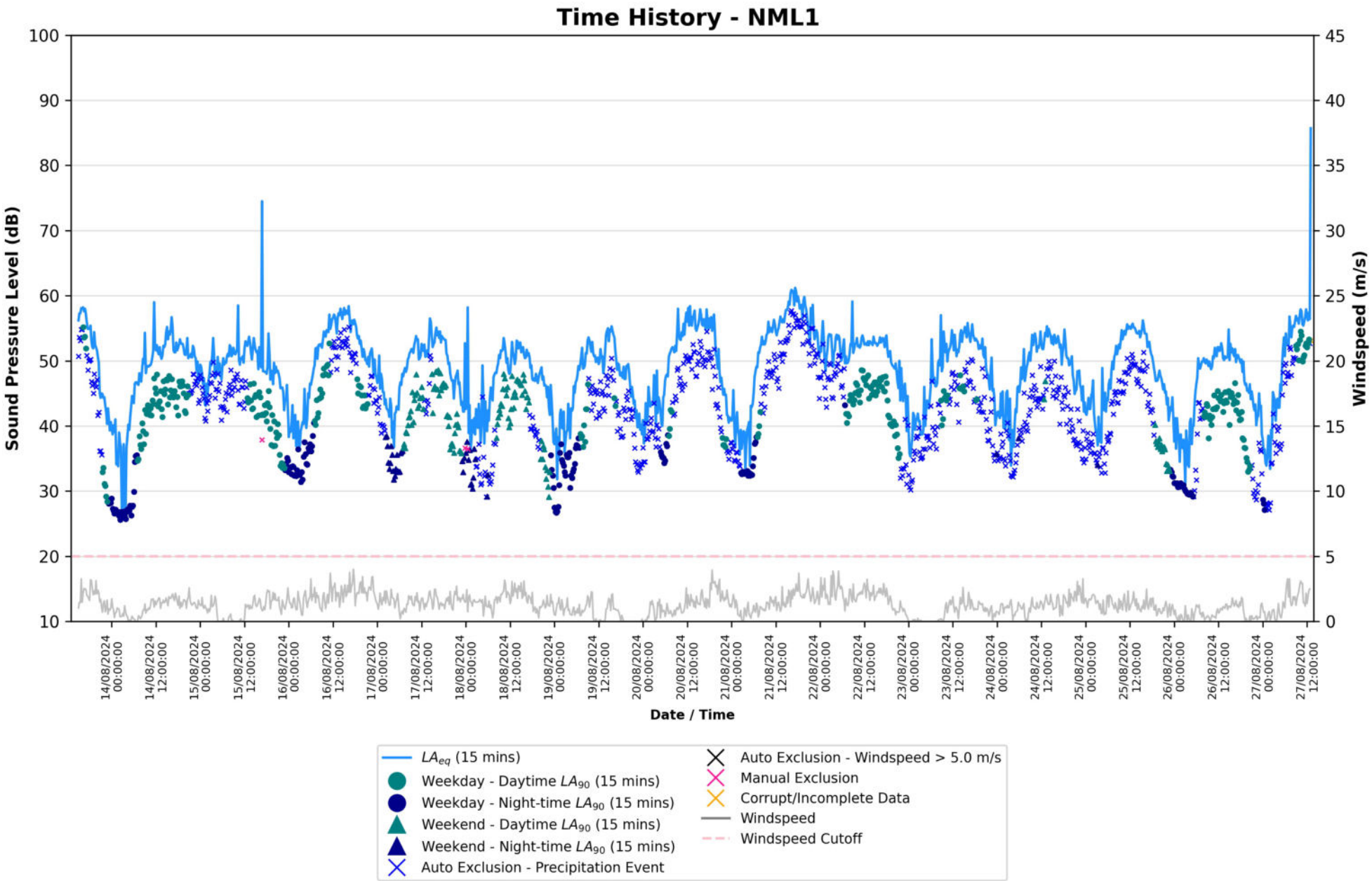
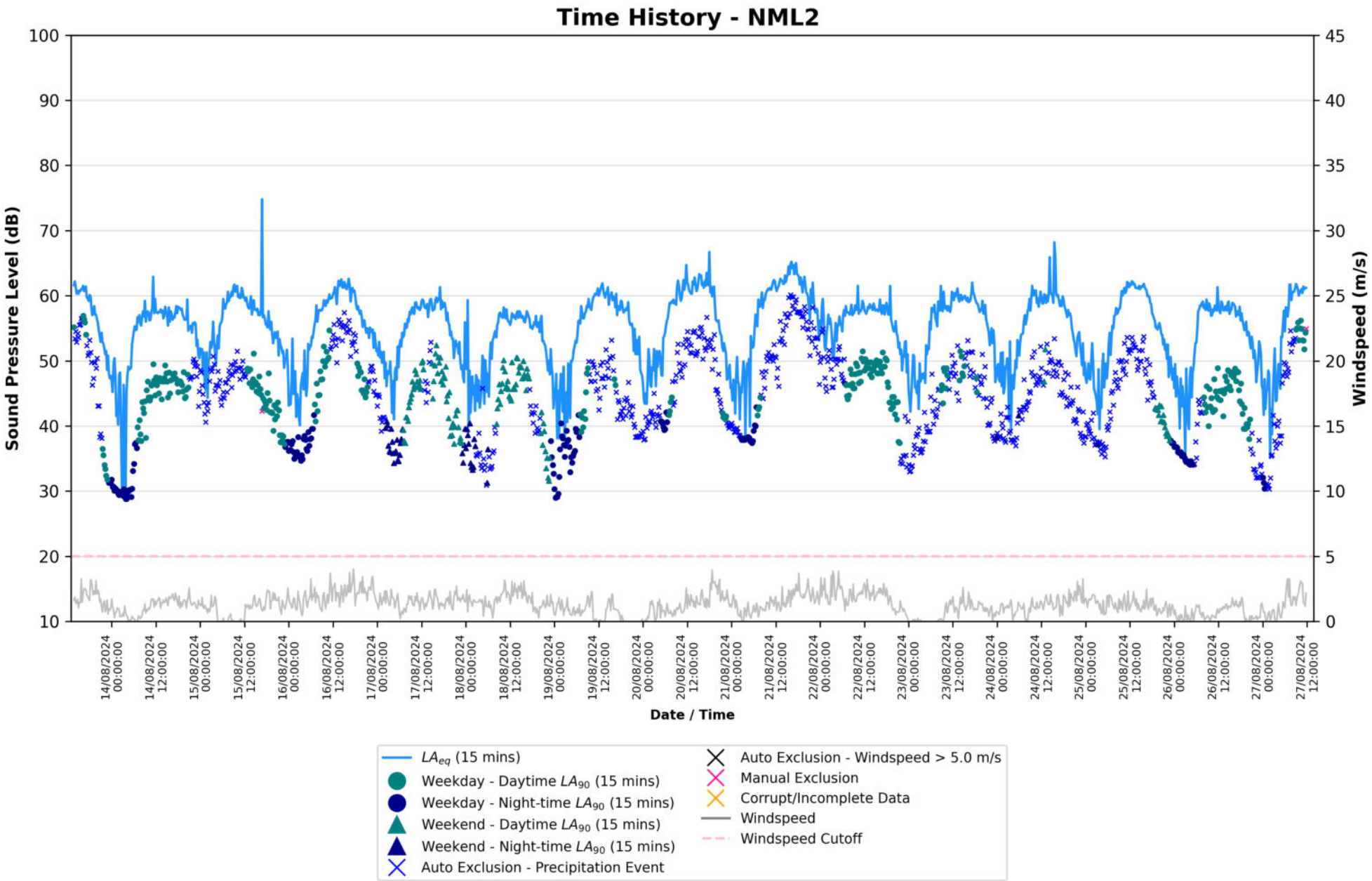
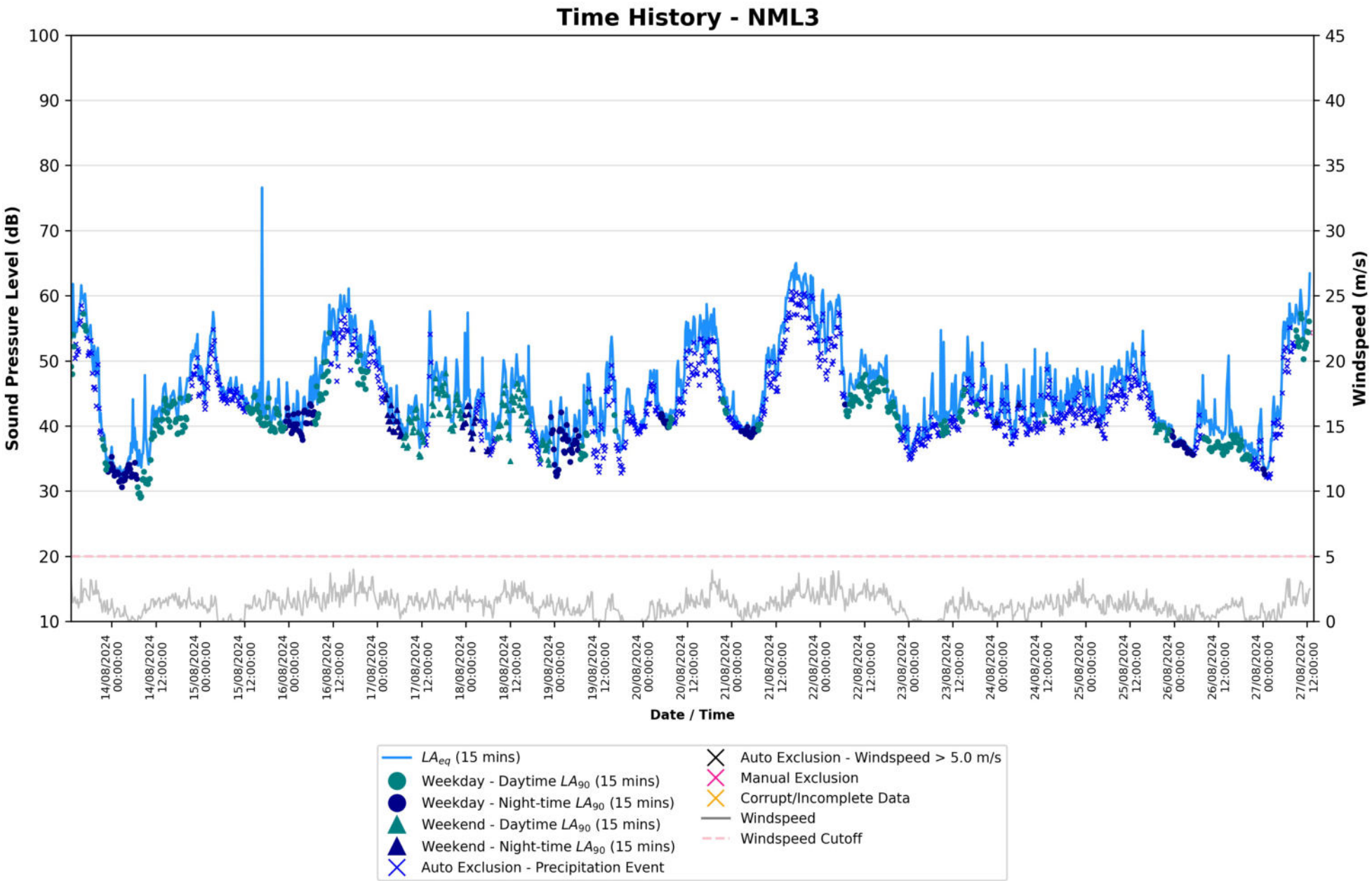
16015 - Corran Ferry - Measured Sound Levels:



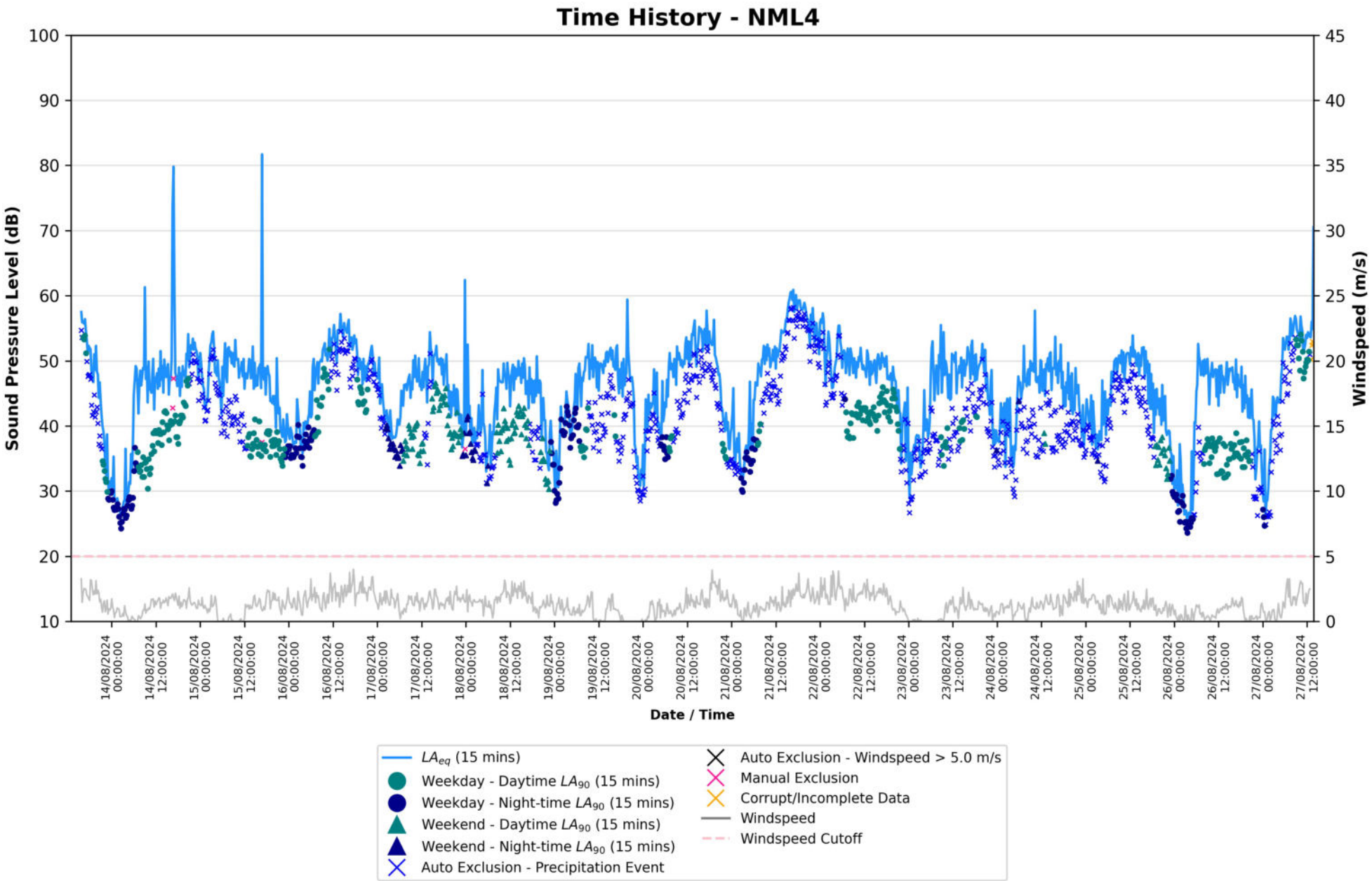
16015 - Corran Ferry - Measured Sound Levels:



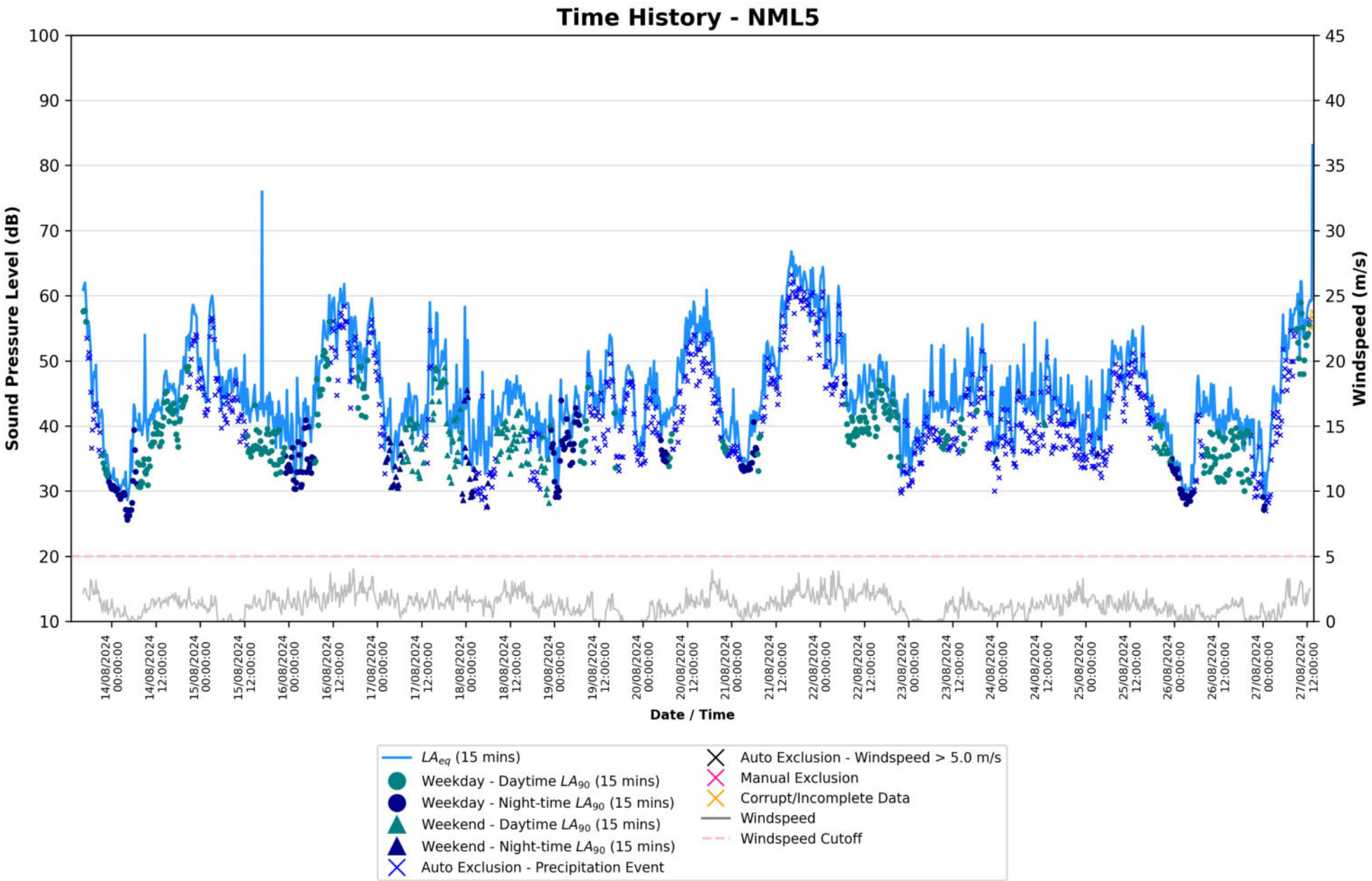
16015 - Corran Ferry - Measured Sound Levels:



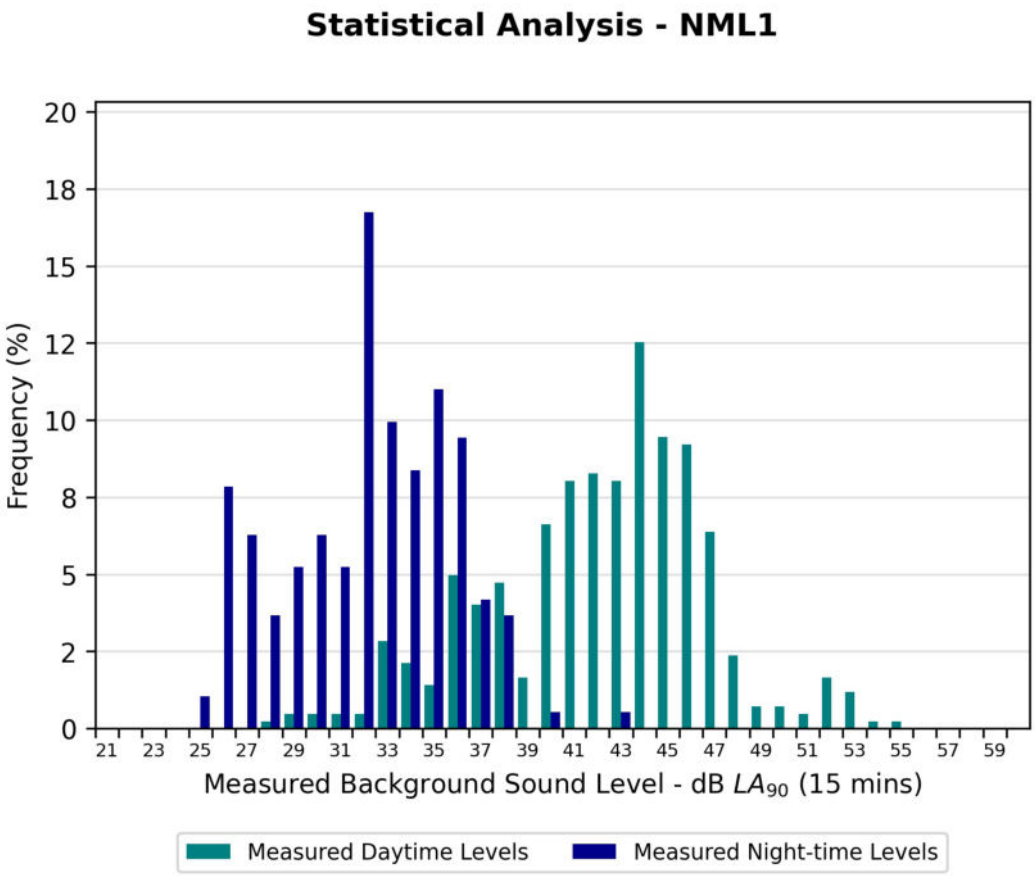
16015 - Corran Ferry - Measured Sound Levels:

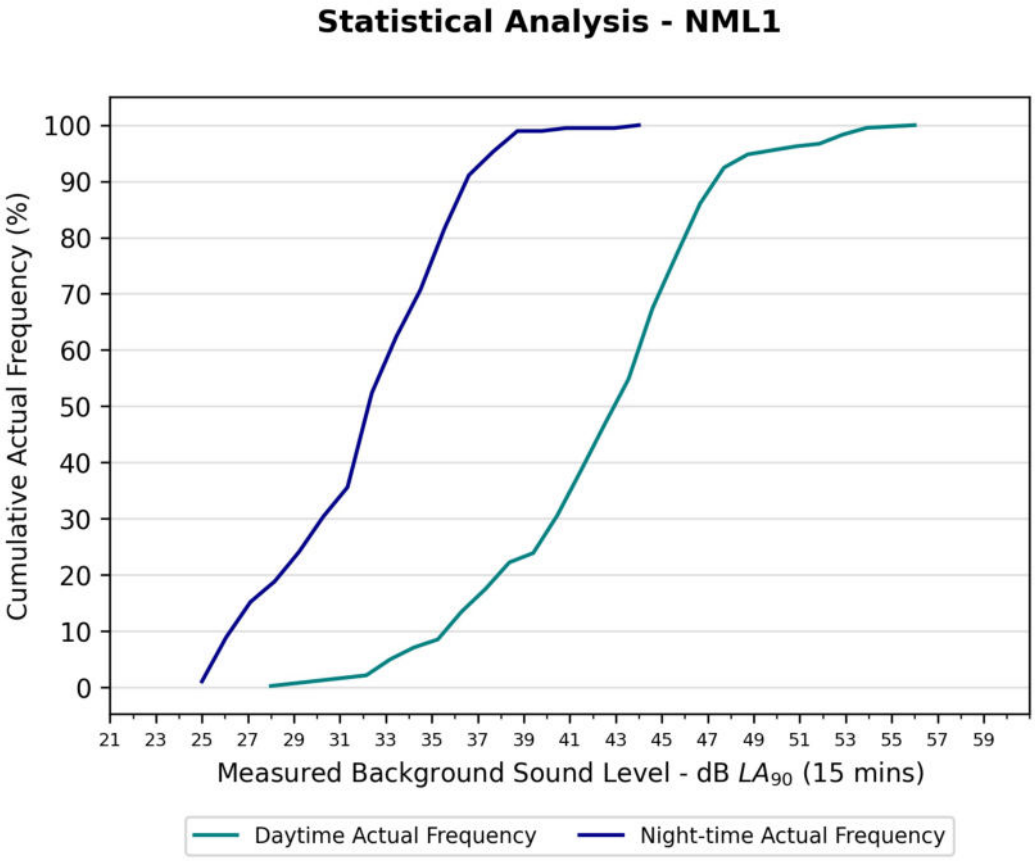


16015 - Corran Ferry - Measured Sound Levels:

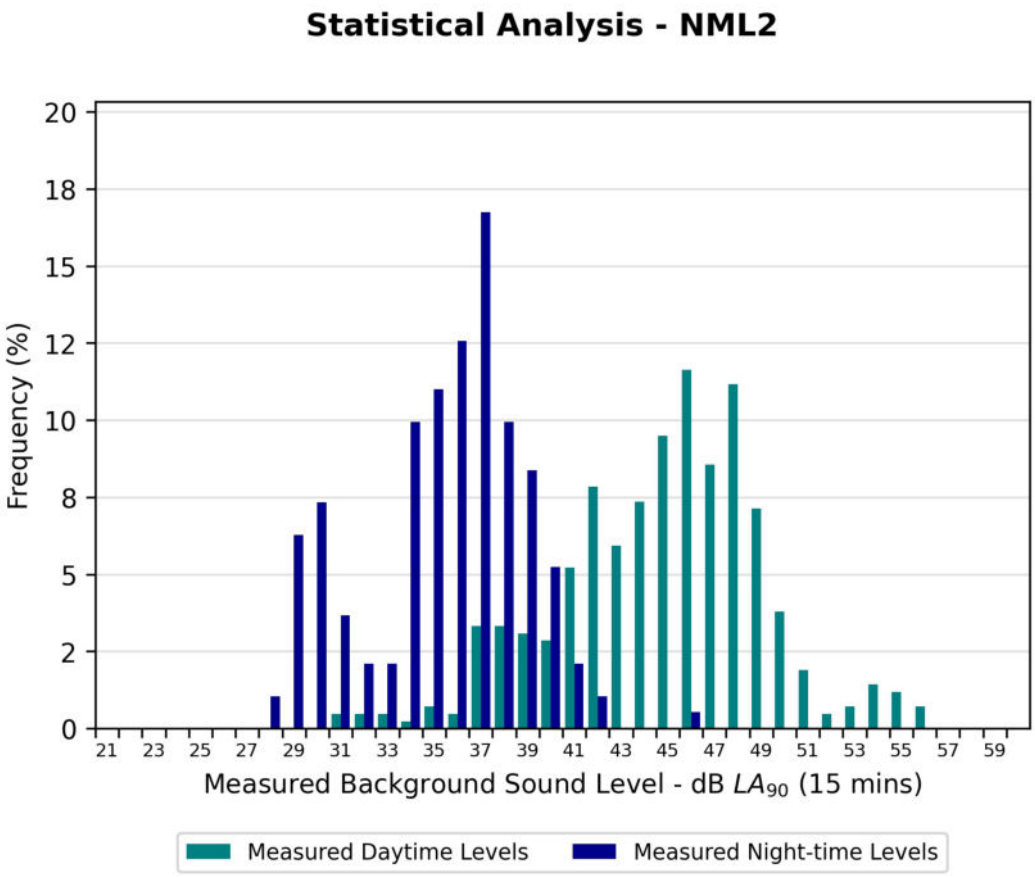


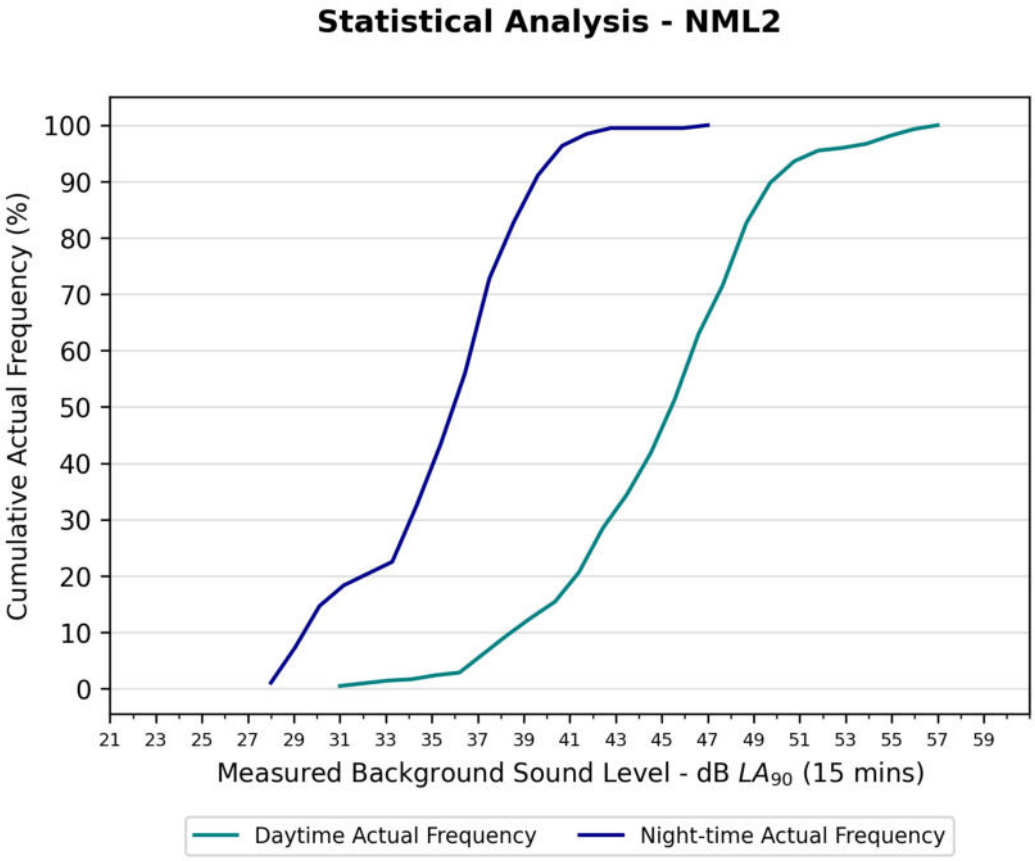
16015 - Corran Ferry - Measured Sound Levels:



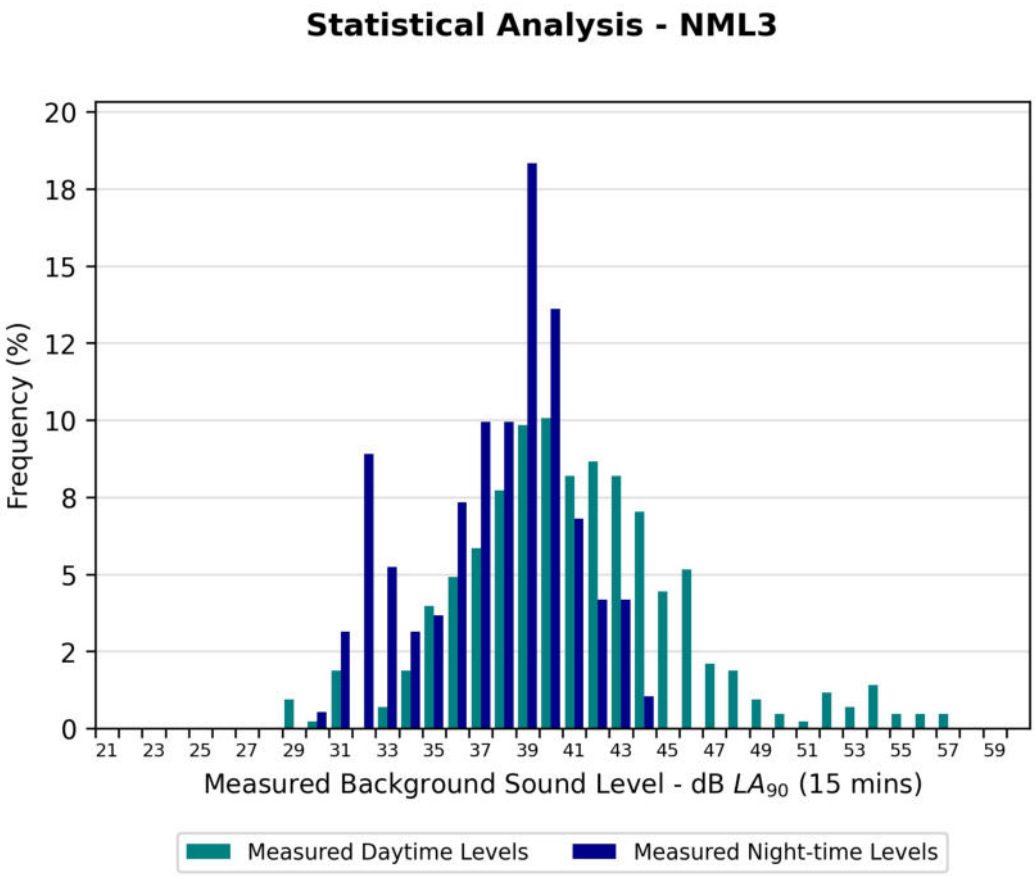


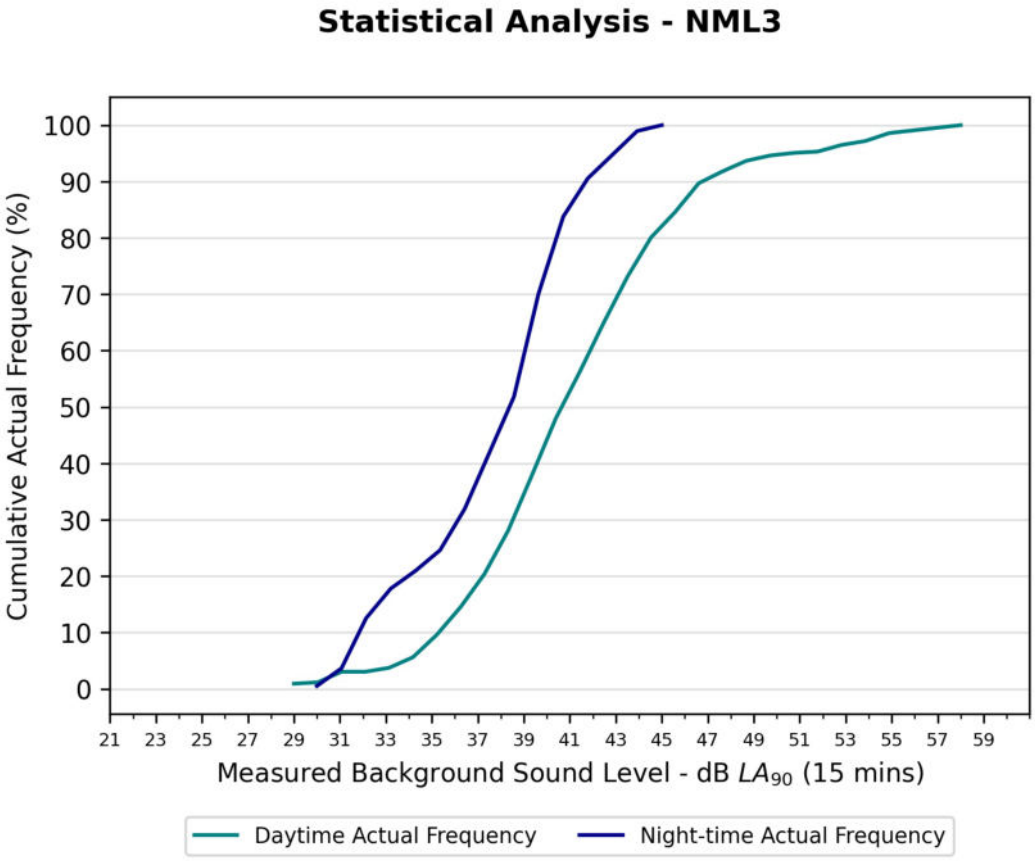
16015 - Corran Ferry - Measured Sound Levels:



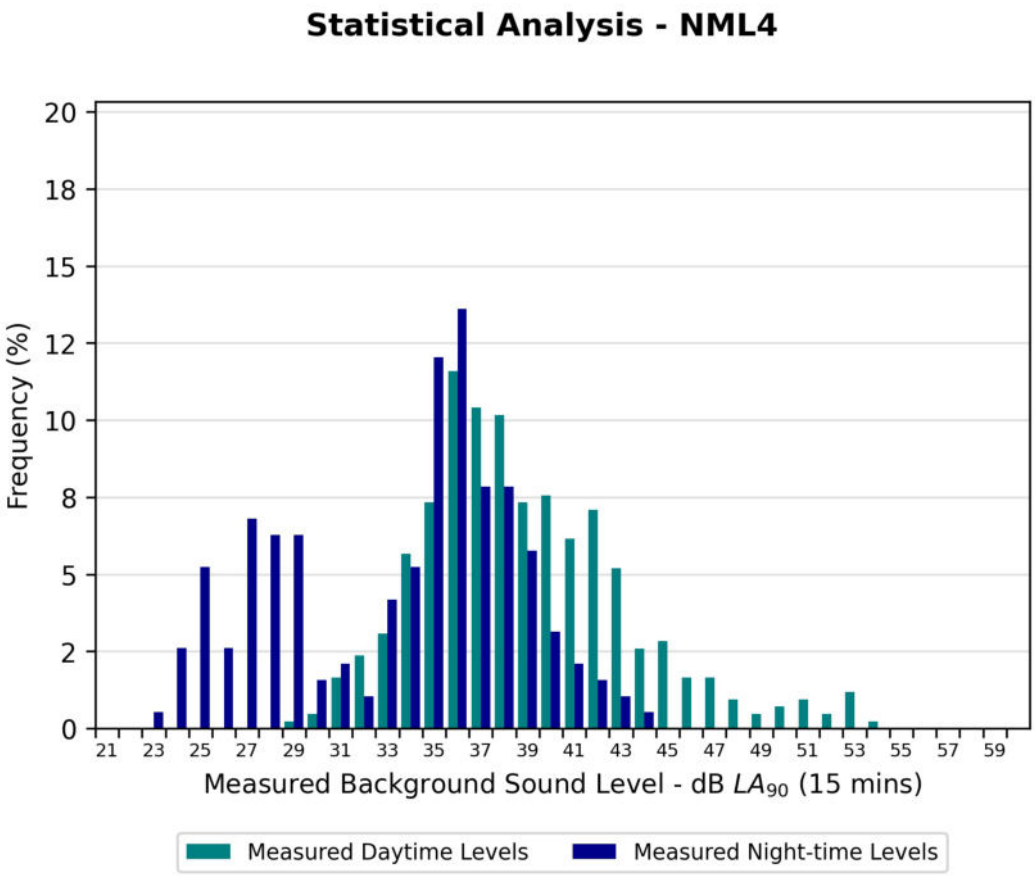


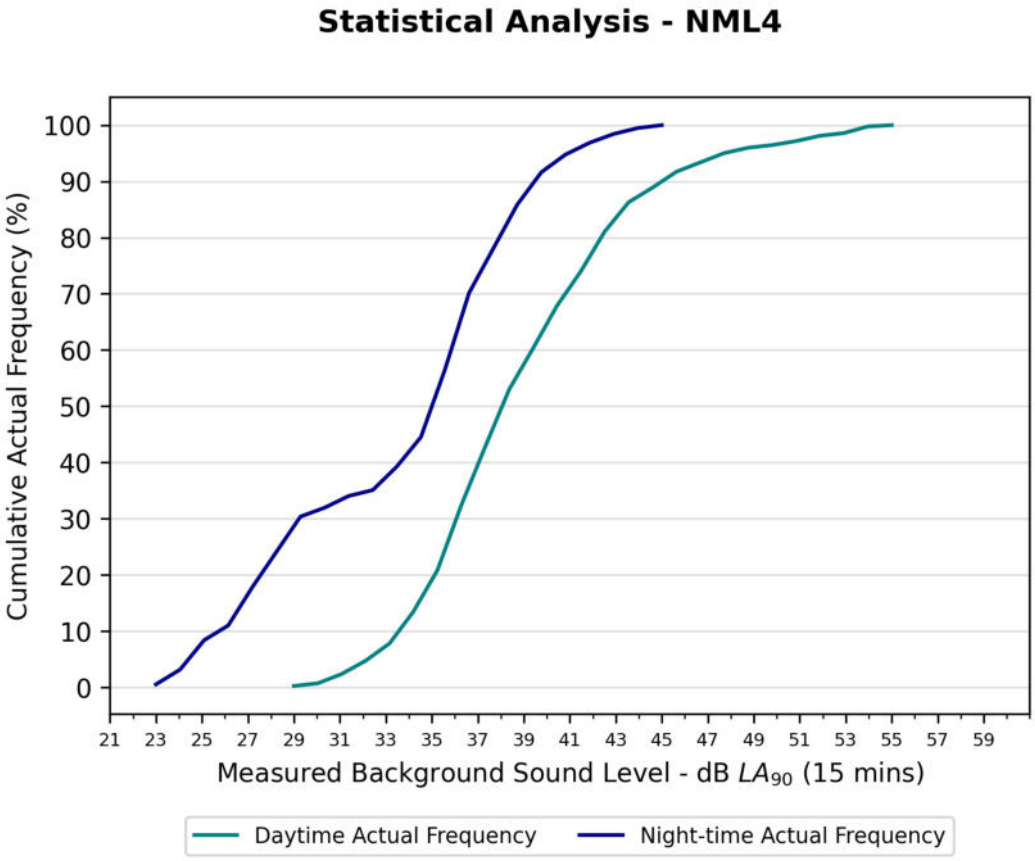
16015 - Corran Ferry - Measured Sound Levels:



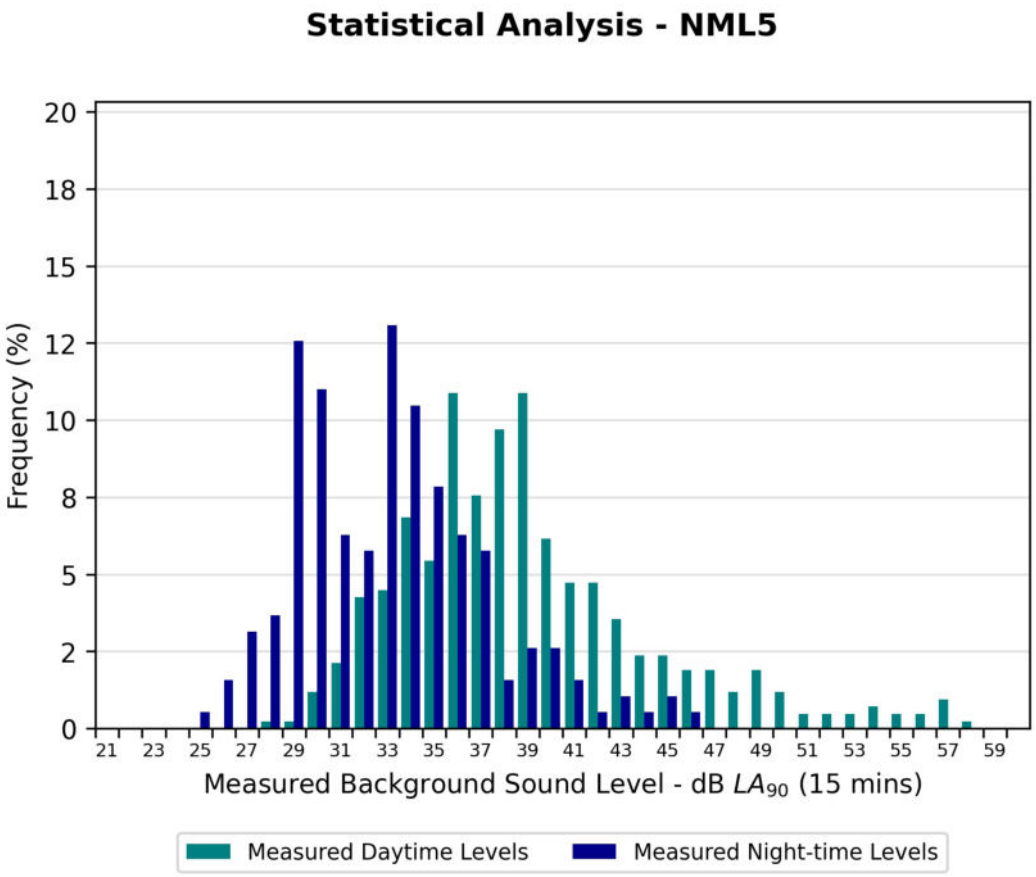


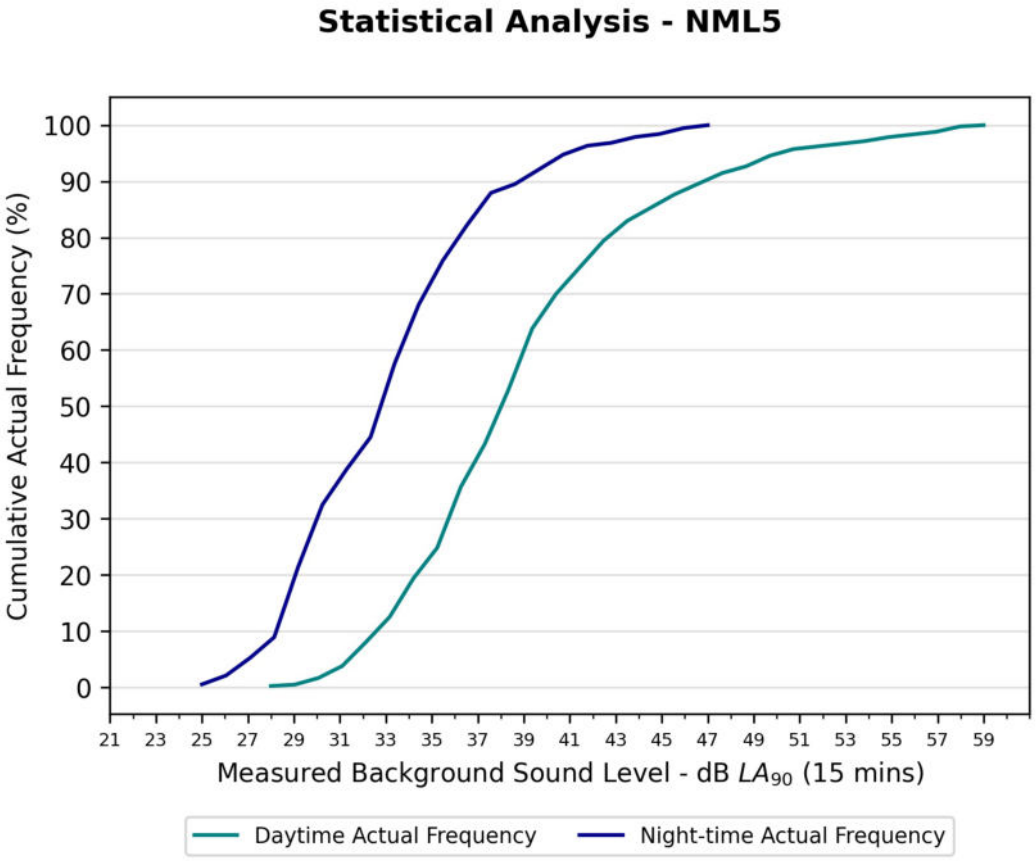
16015 - Corran Ferry - Measured Sound Levels:





16015 - Corran Ferry - Measured Sound Levels:





16015 - Corran Ferry - Measured Sound Levels:

Relevant Statistics

NML1

		COUNT	MEAN	MEDIAN	RANGE
DAYTIME	LA90 (15 MINS)	422	43	43	28 - 55
	LAEQ (15 MINS)	422	51	51	40 - 59
NIGHT-TIME	LA90 (15 MINS)	189	33	33	26 - 43
	LAEQ (15 MINS)	189	41	41	27 - 50

NML2

		COUNT	MEAN	MEDIAN	RANGE
DAYTIME	LA90 (15 MINS)	419	45	46	32 - 57
	LAEQ (15 MINS)	419	57	57	48 - 63
NIGHT-TIME	LA90 (15 MINS)	191	36	36	29 - 46
	LAEQ (15 MINS)	191	48	48	30 - 59

16015 - Corran Ferry - Measured Sound Levels:

Relevant Statistics

NML3

		COUNT	MEAN	MEDIAN	RANGE
DAYTIME	LA90 (15 MINS)	426	42	41	29 - 57
	LAEQ (15 MINS)	426	44	44	34 - 62
NIGHT-TIME	LA90 (15 MINS)	191	38	39	31 - 45
	LAEQ (15 MINS)	191	40	40	32 - 57

NML4

		COUNT	MEAN	MEDIAN	RANGE
DAYTIME	LA90 (15 MINS)	420	39	39	30 - 54
	LAEQ (15 MINS)	420	47	48	32 - 61
NIGHT-TIME	LA90 (15 MINS)	190	34	35	24 - 44
	LAEQ (15 MINS)	190	37	38	25 - 52

16015 - Corran Ferry - Measured Sound Levels:

Relevant Statistics

NML5

		COUNT	MEAN	MEDIAN	RANGE
DAYTIME	LA90 (15 MINS)	422	39	39	28 - 59
	LAEQ (15 MINS)	422	44	43	34 - 62
NIGHT-TIME	LA90 (15 MINS)	191	34	33	26 - 46
	LAEQ (15 MINS)	191	38	38	29 - 58

Corran Ferry Infrastructure Improvement Scheme

Appendix F.4: Construction Timetable

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Comhairle na Gàidhealtachd

Project: Corran Ferry Terminal
Project Number: 2387

Date: 11/11/2024

Construction Period - Plant on Site Estimate

Indicative Resources

Ardgour Ferry Terminal

Activity Number	Phase	Duration of Works	Estimated Start Date	Estimated End Date	Proposed Working Hours	Resource Group	Plant Type	Make and Model	Number in location	Estimated % on Time
1	**Dredge**	1 Month	Oct 2025	Oct 2025	12hrs / Day	1	Dredger (BHD)	Backhoe on Floating Platform (Manu Peka)	1	80
							Barge (SHB)	Frigg & Rind	1	80
							Excavator	JCB 220LC	1	80
2	**Overnight Pier**	9 Months	Dec 2025	Aug 2026	12hrs / Day	2	Excavator	Volvo EC250EL	1	80
								JCB 220LC	1	80
							Dumper	Bell B30E	1	80
							Roller	Bomag BW 213DH	1	10
							Concrete Lorry	Hymix P2 Series	1	10
						3	120t Crawler Crane	Liebherr LR1200.1	1	80
							Piling Hammer and Power Pack	BSP CX110 (D4.5.3)	1	20
								(D4.4)	1	5
3	**Slipway**	7 Months	Dec 2025	Jun 2026	12hrs / Day	2	Excavator	Volvo EC250EL	1	80
								JCB 220LC	1	80
							Dumper	Bell B30E	1	80
							Roller	Bomag BW 213DH	1	10
							Concrete Lorry	Hymix P2 Series	1	10
						3	120t Crawler Crane	Liebherr LR1200.1	1	80
							Piling Hammer and Power Pack	BSP CX110 (D4.5.3)	1	20
								(D4.4)	1	5
4	**Rock Armour/ Earthworks/ Services / Surfacing**	2 Months	Nov 2025	Dec 2025	12hrs / Day	4	Excavator	Volvo EC250EL	1	80
							Excavator (Long Reach)	Sany SY335C	1	80
							Dumper	Bell B30E	1	80
							Roller	Bomag BW 213DH	1	10
							Concrete Lorry	Hymix P2 Series	1	10
						5	Road Planer	Wirtgen W 150CFi	1	20
						6	Road Layer		1	20
						7	Excavator with Hydraulic Breaker	JCB 220LC	1	80
							120t Crawler Crane	Liebherr LR1200.1	1	20
6	**Field Area**	2 Months	Sep 2026	Oct 2026	12hrs / Day	8	Excavator	Volvo EC250EL	1	60
							Dumper	Bell B30E	1	60
							Roller	Bomag BW 213DH	1	10
							60t Mobile Crane	LTM 1060-3.1	1	25
7	**Site Compound Area**	1 Month	Nov 2026	Nov 2026	12hrs / Day	8	Excavator	Volvo EC250EL	1	60
							Dumper	Bell B30E	1	60
							Roller	Bomag BW 213DH	1	10
							60t Mobile Crane	LTM 1060-3.1	1	25
						9	60kVA Generator	CAT DE65 60kVA	1	100

Indicative Programme

Ardgour Ferry Terminal

Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26	Jan-27	Feb-27	Mar-27
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Nether Lochaber Ferry Terminal

No.	Phase	Duration of Works	Estimated Start Date	Estimated End Date	Proposed Working Hours		Plant Type	Make and Model	Number on Site	Estimated % on Time
10	**Dredge**	5 Months	Nov 2025	Mar 2026	12hrs / Day	10	Excavators	JCB 370X inc Ripper Tooth	1	80
								Volvo EC250EL	1	60
							Dumper	Bell B30E	1	60
11	**Breakwater and Alignment Structure**	12 Months	Dec 2025	Oct 2026	12hrs / Day	4	Excavator	Volvo EC250EL	1	80
							Excavator (Long Reach)	Sany SY335C	1	80
							Dumper	Bell B30E	1	80
							Roller	Bomag BW 213DH	1	10
							Concrete Lorry	Hymix P2 Series	1	10
						11	120t Crawler Crane	Liebherr LR1200.1	1	80
						12	Drilling Plant	Casagrande C6XP-2	1	60
12	**Slipway**	4 Months	Aug 2026	Nov 2026	12hrs / Day	4	Excavator	Volvo EC250EL	1	80
							Excavator (Long Reach)	Sany SY335C	1	80
							Dumper	Bell B30E	1	80
							Roller	Bomag BW 213DH	1	10
							Concrete Lorry	Hymix P2 Series	1	10
						11	120t Crawler Crane	Liebherr LR1200.1	1	80
13a	**Tree Felling and Clearing**	2 Months	Oct 2025	Dec 2025	12hrs / Day	14	Tree Felling and Clearing Plant		1	80
13b	**Marshalling Area (Rock Armour/ Earthworks/ Services / Surfacing)**	13 Months	Nov 2025	Dec 2026	12hrs / Day	4	Excavator	Volvo EC250EL	1	80
							Excavator (Long Reach)	Sany SY335C	1	80
							Dumper	Bell B30E	1	80
							Roller	Bomag BW 213DH	1	10
							Concrete Lorry	Hymix P2 Series	1	10
						5	Road Planer	Wirtgen W 150CFi	1	20
						6	Road Layer		1	20
14	**Footway / Cycleway Area (Retaining Wall / Steps / Earthworks/ Services / Surfacing)**	4 Months	Mar 2025	Jun 2025	12hrs / Day	4	Excavator	Volvo EC250EL	1	80
							Excavator (Long Reach)	Sany SY335C	1	80
							Dumper	Bell B30E	1	80
							Roller	Bomag BW 213DH	1	10
							Concrete Lorry	Hymix P2 Series	1	10
						5	Road Planer	Wirtgen W 150CFi	1	20
						6	Road Layer		1	20
15a	**Site Compound Area (External)**	4 Months	Nov 2026	Feb 2026	12hrs / Day	8	Excavator	Volvo EC250EL	1	60
							Dumper	Bell B30E	1	60
							Roller	Bomag BW 213DH	1	10
							60t Mobile Crane	LTM 1060-3.1	1	25
						9	60kVA Generator	CAT DE65 60kVA	1	100
15b	**Site Compound Area (Internal)**	11 Months	Feb 2026	Dec 2026	12hrs / Day	8	Excavator	Volvo EC250EL	1	60
							Dumper	Bell B30E	1	60
							Roller	Bomag BW 213DH	1	10
							60t Mobile Crane	LTM 1060-3.1	1	25
						9	60kVA Generator	CAT DE65 60kVA	1	100

Nether Lochaber Ferry Terminal

Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26	Jan-27	Feb-27	Mar-27
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Corran Ferry Infrastructure Improvement Scheme

Appendix F.5: Construction Noise Modelling Data

Name	Octave Spectrum (dB)											Source
	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Distribution of Materials: Wheeled Excavator	28	92	88	91	92	90	85	79	73	93.9	98.1	BS 5228-1:2009+A1:2014: Annex C. Reference C.4.10
Clearing Site: Tracked excavator	28	108	111	104	101	100	98	97	94	105.9	114	BS 5228-1:2009+A1:2014: Annex C. Reference C2.3
Distribution of Material: Dump Truck (empty)	28	114	107	107	107	107	112	97	88	114.7	117.9	BS 5228-1:2009+A1:2014: Annex C. Reference C2.31
Rolling and Compaction: Roller	28	108	103	105	100	95	90	82	74	101.6	111.1	BS 5228-1:2009+A1:2014: Annex C. Reference C2.38
Rotary bored piling – cast in situ: Tracked drilling rig with hydraulic drifter	28	103	107	104	101	102	107	102	97	110.6	112.9	BS 5228-1:2009+A1:2014: Annex C. Reference C3.15
Mixing concrete: Concrete mixer truck	28	111	102	94	97	98	106	88	83	108	112.9	BS 5228-1:2009+A1:2014: Annex C. Reference C.4.20
Concreting (Other): Mobile telescopic crane	28	118	109	106	102	105	104	97	89	109.4	119.2	BS 5228-1:2009+A1:2014: Annex C. Reference C.4.45
Concreting (Other): Tracked mobile crane	28	101	99	94	95	102	94	86	77	103.4	106.5	BS 5228-1:2009+A1:2014: Annex C. Reference C.4.52
Road planing : Road planer	28	109	115	107	105	105	102	98	95	109.7	117.3	BS 5228-1:2009+A1:2014: Annex C. Reference C.5.7
Rolling & Compaction: Vibratory roller	28	118	112	105	109	101	96	93	89	108.4	119.6	BS 5228-1:2009+A1:2014: Annex C. Reference C.5.21
Paving : Asphalt paver (+ tipper lorry)	28	100	105	102	100	99	98	95	88	104.5	109.3	BS 5228-1:2009+A1:2014: Annex C. Reference C.5.31
Digging out river bed: Long reach tracked excavator	28	102	111	104	103	98	99	91	85	105.4	113	BS 5228-1:2009+A1:2014: Annex C. Reference C.7.1
Face shovel loading dump trucks: Wheeled loader	28	117	115	113	111	112	108	103	99	115.7	121.4	BS 5228-1:2009+A1:2014: Annex C. Reference C.9.11
Breaking boulders/oversized material: Excavator mounted rock breaker	28	114	114	111	106	108	106	104	99	112.9	119	BS 5228-1:2009+A1:2014: Annex C. Reference C.9.13
Manu Pekka Boat/Dredge					109.3					109.3	112.5	Manu Pekka (Intersona BV: 6790-01 rev. A)
Tug Boat Idling					87					87	90.2	Aberdeen harbour Expansion ES - Chapter 20 Noise
Tug Boat Moving					94.4					94.4	97.6	Aberdeen Harbour Expansion ES - Chapter 20 Noise
Hydraulic Vibratory Driver					118					118	121.2	BS 5228-1:2009+A1:2014: Annex D. Reference D.4.53
Sawing Timber - Petrol Driven Chainsaw					114					114	117.2	BS 5228-1:2009+A1:2014: Annex D. Reference D.2.14
60kVA Diesel Generator		81.5	82.5	82.5	82.5	80.5	78.5	75.5	70.5	85.7	89.6	BS 5228-1:2009+A1:2014: Annex C. Reference C.4.76
5kVA Petrol Generator		73.6	84.7	92.2	97.6	98.8	98	94.8	87.7	104	107.9	BS 5228-1:2009+A1:2014: Annex D. Reference D.7.49

Corran Ferry Infrastructure Improvement Scheme

Appendix F.5: Construction Noise Modelling Data

Name	Octave Spectrum (dB)											Source
	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Distribution of Materials: Wheeled Excavator	28	92	88	91	92	90	85	79	73	93.9	98.1	BS 5228-1:2009+A1:2014: Annex C. Reference C.4.10
Clearing Site: Tracked excavator	28	108	111	104	101	100	98	97	94	105.9	114	BS 5228-1:2009+A1:2014: Annex C. Reference C2.3
Distribution of Material: Dump Truck (empty)	28	114	107	107	107	107	112	97	88	114.7	117.9	BS 5228-1:2009+A1:2014: Annex C. Reference C2.31
Rolling and Compaction: Roller	28	108	103	105	100	95	90	82	74	101.6	111.1	BS 5228-1:2009+A1:2014: Annex C. Reference C2.38
Rotary bored piling – cast in situ: Tracked drilling rig with hydraulic drifter	28	103	107	104	101	102	107	102	97	110.6	112.9	BS 5228-1:2009+A1:2014: Annex C. Reference C3.15
Mixing concrete: Concrete mixer truck	28	111	102	94	97	98	106	88	83	108	112.9	BS 5228-1:2009+A1:2014: Annex C. Reference C.4.20
Concreting (Other): Mobile telescopic crane	28	118	109	106	102	105	104	97	89	109.4	119.2	BS 5228-1:2009+A1:2014: Annex C. Reference C.4.45
Concreting (Other): Tracked mobile crane	28	101	99	94	95	102	94	86	77	103.4	106.5	BS 5228-1:2009+A1:2014: Annex C. Reference C.4.52
Road planing : Road planer	28	109	115	107	105	105	102	98	95	109.7	117.3	BS 5228-1:2009+A1:2014: Annex C. Reference C.5.7
Rolling & Compaction: Vibratory roller	28	118	112	105	109	101	96	93	89	108.4	119.6	BS 5228-1:2009+A1:2014: Annex C. Reference C.5.21
Paving : Asphalt paver (+ tipper lorry)	28	100	105	102	100	99	98	95	88	104.5	109.3	BS 5228-1:2009+A1:2014: Annex C. Reference C.5.31
Digging out river bed: Long reach tracked excavator	28	102	111	104	103	98	99	91	85	105.4	113	BS 5228-1:2009+A1:2014: Annex C. Reference C.7.1
Face shovel loading dump trucks: Wheeled loader	28	117	115	113	111	112	108	103	99	115.7	121.4	BS 5228-1:2009+A1:2014: Annex C. Reference C.9.11
Breaking boulders/oversized material: Excavator mounted rock breaker	28	114	114	111	106	108	106	104	99	112.9	119	BS 5228-1:2009+A1:2014: Annex C. Reference C.9.13
Manu Pekka Boat/Dredge					109.3					109.3	112.5	Manu Pekka (Intersona BV: 6790-01 rev. A)
Tug Boat Idling					87					87	90.2	Aberdeen harbour Expansion ES - Chapter 20 Noise
Tug Boat Moving					94.4					94.4	97.6	Aberdeen Harbour Expansion ES - Chapter 20 Noise
Hydraulic Vibratory Driver					118					118	121.2	BS 5228-1:2009+A1:2014: Annex D. Reference D.4.53
Sawing Timber - Petrol Driven Chainsaw					114					114	117.2	BS 5228-1:2009+A1:2014: Annex D. Reference D.2.14
60kVA Diesel Generator		81.5	82.5	82.5	82.5	80.5	78.5	75.5	70.5	85.7	89.6	BS 5228-1:2009+A1:2014: Annex C. Reference C.4.76
5kVA Petrol Generator		73.6	84.7	92.2	97.6	98.8	98	94.8	87.7	104	107.9	BS 5228-1:2009+A1:2014: Annex D. Reference D.7.49

Corran Ferry Infrastructure Improvement Scheme

Appendix F.6: BS 5228 Threshold Exceedances

Construction Noise Daytime Immission Level against BS 5228 Threshold Levels

NAL - Name	Threshold Value (dB LAeq,t)	Immission Level (dB)														
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
NAL01 - Corran Point lighthouse	65	64	56	56	57	56	57	61	60	60	56	56	55	55	64	51
NAL02 - The Inn	65	48	76	75	72	74	69	70	70	70	63	71	52	52	52	52
NAL03 - Ferry Cottage	65	51	76	76	74	74	71	72	71	71	67	77	56	56	55	55
NAL04 - Pier Cottage	65	52	76	76	74	73	71	71	70	70	67	75	56	56	55	54
NAL05 - St Monance	65	52	75	76	74	72	71	70	69	69	67	72	56	56	55	54
NAL06 - Ferry House	65	50	75	76	75	71	71	69	67	67	68	71	55	55	54	54
NAL07 - Nurses House	65	50	72	74	74	69	71	69	67	67	68	69	55	55	54	54
NAL08 - 1 North Corran	65	50	69	72	73	70	71	68	66	66	67	69	55	55	54	54
NAL09 - 2 North Corran	65	52	69	71	73	69	70	68	65	65	67	69	61	61	55	54
NAL10 - 3 North Corran	65	50	66	67	68	65	66	64	61	61	63	65	62	62	52	51
NAL11 - 4 North Corran	65	50	66	68	70	67	68	66	63	63	66	67	54	54	54	54
NAL12 - 5&6 North Corran	65	57	62	64	65	62	63	62	60	61	61	61	80	80	57	51
NAL13 - 7&8 North Corran	65	54	64	66	67	65	66	62	60	60	64	64	71	71	56	54
NAL14 - Farm	65	63	53	53	53	53	53	53	53	53	53	53	53	53	63	46
NAL15 - North Corran Beag	65	57	68	69	69	68	69	68	71	64	69	69	68	69	68	62
NAL16 - Sealadh Bragh	65	54	63	64	64	63	61	59	68	70	60	62	59	59	59	58
NAL17 - Corran Beag	65	51	62	62	62	62	62	62	60	67	62	63	62	62	62	50
NAL18 - NL04	65	50	58	59	59	59	61	60	63	68	60	61	60	60	60	51
NAL19 - The Corran	65	51	58	59	59	58	60	58	61	71	58	55	50	50	48	55
NAL20 - Corran House	65	55	62	62	62	62	62	62	66	66	62	63	62	62	62	54
NAL21 - Kynance	65	51	61	61	61	62	62	61	66	70	61	61	60	60	60	50

NAL - Name	Threshold Value (dB LAeq,t)	Immission Level (dB)														
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
NAL22 - Corran View	65	50	59	59	59	59	60	58	64	71	58	60	59	59	59	50
NAL23 - Corranlea	65	51	57	57	57	58	59	56	61	73	56	60	59	59	59	50
NAL24 - Ashley Bank	65	51	54	54	55	56	57	54	61	71	54	58	57	57	57	50
NAL25 - Heatherbank Cottage	65	59	51	52	52	60	52	52	52	52	52	53	51	51	51	59
NAL26 - Janika Cottage 4	65	64	52	52	52	64	52	52	51	52	51	52	52	52	52	64
NAL27 - Inchree Chalets 2	65	69	60	60	60	69	60	60	60	60	60	60	60	60	60	69
NAL28 - Levante	65	63	49	49	49	63	49	49	49	49	49	49	49	49	50	63
NAL29 - Inchree Chalets	65	60	54	54	54	60	54	54	55	58	53	54	54	54	54	60

Construction Noise Evening and Weekend Immission Level against BS 5228 Threshold Levels

NAL - Name	Threshold Value (dB LAeq,t)	Immission Level (dB)														
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
NAL01 - Corran Point lighthouse	55	33	33	33	33	33	34	34	34	34	34	34	34	34	34	19
NAL02 - The Inn	55	10	10	10	10	10	20	20	20	20	20	20	20	20	20	20
NAL03 - Ferry Cottage	55	15	15	15	15	15	23	23	23	23	23	23	23	23	23	23
NAL04 - Pier Cottage	55	22	22	22	22	22	25	25	25	25	25	25	25	25	25	23
NAL05 - St Monance	55	22	22	22	22	22	25	25	25	25	25	25	25	25	25	23
NAL06 - Ferry House	55	18	18	18	18	18	23	23	23	23	23	23	23	23	23	23
NAL07 - Nurses House	55	13	13	13	13	13	23	23	23	23	23	23	23	23	23	22
NAL08 - 1 North Corran	55	19	19	19	19	19	24	24	24	24	24	24	24	24	24	23
NAL09 - 2 North Corran	55	22	22	22	22	22	25	25	25	25	25	25	25	25	25	23
NAL10 - 3 North Corran	55	21	21	21	21	21	23	23	23	23	23	23	23	23	23	19
NAL11 - 4 North Corran	55	13	13	13	13	13	22	22	22	22	22	22	22	22	22	22
NAL12 - 5&6 North Corran	55	29	29	29	29	29	30	30	30	30	30	30	30	30	30	20
NAL13 - 7&8 North Corran	55	25	25	25	25	25	27	27	27	27	27	27	27	27	27	23
NAL14 - Farm	55	34	34	34	34	34	34	34	34	34	34	34	34	34	34	16
NAL15 - North Corran Beag	55	21	21	21	21	21	30	30	30	30	30	30	30	30	30	29
NAL16 - Sealadh Bragh	55	16	16	16	16	16	25	25	25	25	25	25	25	25	25	25
NAL17 - Corran Beag	55	21	21	21	21	21	23	23	23	23	23	23	23	23	23	21
NAL18 - NL04	55	21	21	21	21	21	24	24	24	24	24	24	24	24	24	23
NAL19 - The Corran	55	7	7	7	7	7	21	21	21	21	21	21	21	21	21	21
NAL20 - Corran House	55	25	25	25	25	25	26	26	26	26	26	26	26	26	26	25
NAL21 - Kynance	55	22	22	22	22	22	23	23	23	23	23	23	23	23	23	21

NAL - Name	Threshold Value (dB LAeq,t)	Immission Level (dB)														
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
NAL22 - Corran View	55	22	22	22	22	22	23	23	23	23	23	23	23	23	23	21
NAL23 - Corranlea	55	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22
NAL24 - Ashley Bank	55	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22
NAL25 - Heatherbank Cottage	55	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
NAL26 - Janika Cottage 4	55	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
NAL27 - Inchree Chalets 2	55	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
NAL28 - Levante	55	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29
NAL29 - Inchree Chalets	55	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34

Construction Noise Night-time Immission Level against BS 5228 Threshold Levels

NAL - Name	Threshold Value (dB LAeq,t)	Immission Level (dB)														
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
NAL01 - Corran Point lighthouse	45	33	33	33	33	33	34	34	34	34	34	34	34	34	34	19
NAL02 - The Inn	45	10	10	10	10	10	20	20	20	20	20	20	20	20	20	20
NAL03 - Ferry Cottage	45	15	15	15	15	15	23	23	23	23	23	23	23	23	23	23
NAL04 - Pier Cottage	45	22	22	22	22	22	25	25	25	25	25	25	25	25	25	23
NAL05 - St Monance	45	22	22	22	22	22	25	25	25	25	25	25	25	25	25	23
NAL06 - Ferry House	45	18	18	18	18	18	23	23	23	23	23	23	23	23	23	23
NAL07 - Nurses House	45	13	13	13	13	13	23	23	23	23	23	23	23	23	23	22
NAL08 - 1 North Corran	45	19	19	19	19	19	24	24	24	24	24	24	24	24	24	23
NAL09 - 2 North Corran	45	22	22	22	22	22	25	25	25	25	25	25	25	25	25	23
NAL10 - 3 North Corran	45	21	21	21	21	21	23	23	23	23	23	23	23	23	23	19
NAL11 - 4 North Corran	45	13	13	13	13	13	22	22	22	22	22	22	22	22	22	22
NAL12 - 5&6 North Corran	45	29	29	29	29	29	30	30	30	30	30	30	30	30	30	20
NAL13 - 7&8 North Corran	45	25	25	25	25	25	27	27	27	27	27	27	27	27	27	23
NAL14 - Farm	45	34	34	34	34	34	34	34	34	34	34	34	34	34	34	16
NAL15 - North Corran Beag	50	21	21	21	21	21	30	30	30	30	30	30	30	30	30	29
NAL16 - Sealadh Bragh	50	16	16	16	16	16	25	25	25	25	25	25	25	25	25	25
NAL17 - Corran Beag	50	21	21	21	21	21	23	23	23	23	23	23	23	23	23	21
NAL18 - NL04	50	21	21	21	21	21	24	24	24	24	24	24	24	24	24	23
NAL19 - The Corran	50	7	7	7	7	7	21	21	21	21	21	21	21	21	21	21
NAL20 - Corran House	45	25	25	25	25	25	26	26	26	26	26	26	26	26	26	25
NAL21 - Kynance	45	22	22	22	22	22	23	23	23	23	23	23	23	23	23	21

NAL - Name	Threshold Value (dB LAeq,t)	Immission Level (dB)														
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
NAL22 - Corran View	45	22	22	22	22	22	23	23	23	23	23	23	23	23	23	21
NAL23 - Corranlea	45	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22
NAL24 - Ashley Bank	45	24	24	24	24	24	24	24	24	24	24	24	24	24	24	22
NAL25 - Heatherbank Cottage	45	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
NAL26 - Janika Cottage 4	45	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
NAL27 - Inchree Chalets 2	45	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
NAL28 - Levante	45	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29
NAL29 - Inchree Chalets	45	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34

Corran Ferry Infrastructure Improvement Scheme

Appendix F.7: Operational Noise Data

Name	Octave Spectrum (dB)											Source
	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Diesel Generator Assessment Model	39.3	55.5	66.6	74.1	79.5	80.7	79.9	76.7	69.6	85.9	90.1	Broadband Lw calculated from 800kVA Ultra Quiet Fusteq Generator. Spectrum of Typical Generator Used.

LOWARA
a xylem brand

Customer	Date 1/3/2019
Contact	Project
Phone number	Project no.
Email	

Technical Data

10SV06F022T

Operating data

Pumpe type	Single head pump			Fluid		Water, pure
No. of pumps / Reserve		1 / 0		Operating temperature t A	°C	4
Nominal flow		l/s	0	pH-value at t A		7
Nominal head		m	0	Density at t A	kg/dm³	1
Static head		m	0	Kin. viscosity at t A	mm²/s	1.569
Inlet pressure		bar	0	Vapor pressure at t A	bar	1
Environmental temperature		°C	20	Solids		0
Available system NPSH		m	0	Altitude	m	0

Pump data

Make	Lowara				Nominal	l/s	(	)
Speed		1/min	2900	Flow	Max-	l/s	3.9	
Number of stages			6		Min-	l/s		
Max. casing pressure		bar			Nominal	m		
Max. working pressure		bar	7	Head	at Qmax	m	33.8	
Head H(Q=0)		m	72		at Qmin	m	71.8	
Weight		kg	38	Shaft power		kW	(	)
	Max.	mm	96	Max. shaft power		kW	2.2	
Impeller R	designed	mm	96	Efficiency		%		
	Min.	mm	96	NPSH 3%		m		

Pump Materials

Pump body	Stainless steel / AISI 304
IMPELLER	Stainless steel / AISI 304
DIFFUSER	Stainless steel / AISI 304
Outer sleeve	Stainless steel / AISI 304
SHAFT	Stainless steel / AISI 304
ADAPTER	Cast iron
Base	Aluminium
COUPLING	Aluminium
SEAL HOUSING	Stainless steel / AISI 304
Coupling protection	Stainless steel / AISI 304
Shaft sleeve and bushing	Tungsten carbide
Fill / drain plugs	Stainless steel / AISI 304
Tie rods	Galvanized steel
WEAR RING	Technopolymer PPS

Shaft Seal

e-SV Mechanical seal	Roten
e-SV - Uniten (-30 / +120 °C)	
1 - Rotating part	Silicon Carbide
2 - Stationary part	Resin impregnated carbon
3 - Elastomers	EPDM
4 - Springs	AISI 316
5 - Other components	AISI 316

Motor data

Manufacturer	Lowara	Electric voltage	400 V	Speed	2900 1/min	Insulation class	155 (F)
Specific design	IE3 Three phase surface motor (e-SV)			Frame size	90	Colour	RAL 5010
Type	PLM90B14/322 E3 (220-240/380-415V)						
Rated power	2.2 kW	Degree of protection	IP55				
Electric current	4.56 A						

Remarks:

Spec Sheet

Ultra Quiet Fusteq Generator 800kVA

800kVA

Ultra Quiet Fusteq Generator

ENGINE Ref: CUMMINS
ALTERNATOR Ref: LEROY SOMER / MECC ALTE

Hot dip galvanised sound attenuated enclosure
Bunded 1700 litre base fuel tank complete with 3 way valve
4 Base lift points
4 Pole circuit breaker with earth leakage Protection with on off switch
Deep sea 8610 load share control panel
Plastic coated locks and handles
Lockable canopy with common single key
Racor filter
50/60 Hz switchable
Low water level alarm
Low oil level alarm
Cummins water separator filter
Sump oil vac pump
Battery isolator
Low oil pressure sensor
Water temperature sensor
CT for genset paralleling
Hardwire via copper busbar
Microswitch protection
Motorized MCCB
Alternator anti condensation heater
Battery charger
R731 3 phase regulator

Standby (kVA)	Prime Power (kVA)	Engine Make / Type	Governor	Tank Capacity (Litre)	Fuel Consumption per hour (Litre) 50%	75%	100%	dBA @ 7m	Size (mm)	Wet Weight (kg)	Control Panel
880	800	CUMMINS	Electronic	1700	86	122	162	61	20' High Cube Container	13400	Deep Sea 8610 Loadshare

Power Depots:

Midlands
Fairfield Park,
Halesowen,
B62 9JL
Tel: 0121 559 1818

South East
Europa Park
Grays
RM20 4DB
Tel: 0137 536 6766

South West
Bradley Road,
Bristol
BS20 7NZ
Tel: 0117 901 2199

West Yorkshire
Flanshaw Way
Wakefield,
WF2 9PL
Tel: 0192 497 7077

North East
Shadon Way
Chester-le-Street
DH3 2RN
Tel: 0191 411 1200

Scotland
Livingston
West Lothian
EH54 5GG
Tel: 01506 353 399

John F Hunt Fuels
Tel: 0808 175 1111

power@johnfhunt.co.uk
johnfhuntpower.co.uk

2024

Member of the Association for Consultancy and Engineering

Corran Ferry Infrastructure Improvement Scheme

Appendix I.1: Flood Risk Assessment & Drainage Impact Assessment

Wallace Stone Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

THE HIGHLAND COUNCIL

CORRAN FERRY INFRASTRUCTURE IMPROVEMENT SCHEME

FLOOD RISK ASSESSMENT & DRAINAGE IMPACT ASSESSMENT

The Highland Council
Highland Council Headquarters
Glenurquhart Road
Inverness
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Date: November 2024

Doc Ref – 2387-Doc-029 v02

Member of the Association
for Consultancy and Engineering

This document was prepared as follows:-

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Checked By	B. Purcell		25/11/24
Approved By	B. Purcell		15/01/25

and revised as follows:

REVISION STATUS INDICATOR

Page No	Date	Revision	Description of Change	Initial
-	03/12/24	v01	Revision following Affric Review	BP
4.1 and 4.4	18/02/25	v02	Revision following Client Review. Address drainage issues around Ardgour Inn	BP

This document has been reviewed for compliance with project requirements in accordance with Wallace Stone LLP Quality Management System.

THE HIGHLAND COUNCIL
CORRAN FERRY SLIPWAYS AND INFRASTRUCTURE IMPROVEMENTS

FLOOD RISK ASSESSMENT & DRAINAGE IMPACT ASSESSMENT

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THE HIGHLAND COUNCIL
CORRAN FERRY INFRASTRUCTURE IMPROVEMENT SCHEME

FLOOD RISK ASSESSMENT & DRAINAGE IMPACT ASSESSMENT

1. Introduction

1.1 General

The Corran ferry service is a critical transport link which operates between the villages of Ardgour, on the West shore of Loch Linnhe and Nether Lochaber on the East shore. On behalf of The Highland Council (THC) we have been developing design solutions to improve the infrastructure for the Corran Ferry crossing to facilitate the introduction of a New Electric Vessel (NEV), to replace an existing vessel which is at the end of its serviceable lifespan. Alterations and improvements to the existing infrastructure are required as part of this project to facilitate a NEV and to address operational and service resilience issues which impact the crew, residents and ferry users, in particular communities and businesses which rely on the Corran Ferry service.

The project includes the provision of new slipways, alignment structure, overnight berthing structure, improvement of marshalling provisions for vehicles, pedestrians and cycles, and associated ferry user facilities.

Pre-application advice for major developments (22/-4570/PREMAJ) provided by THC highlighted the requirement for a Flood Risk Assessment (FRA) and Drainage Impact Assessment (DIA) to be undertaken. This document has been prepared in accordance with the Highland Council's Flood Risk and Drainage Impact Assessment Supplementary Guidance and will form part of the Environmental Impact Assessment (EIA) and Planning Application for the proposed infrastructure upgrades on either side of the crossing.

1.2 Construction Phase

The Contractor will be responsible for developing proposals and implementing their arrangements for dealing with drainage and flood risk during the construction phase.

Issues include wash down areas, plant working within tidal zones, run-off from exposed earthworks surfaces, site compound and welfare facilities.

All arrangements during the construction phase will be undertaken to comply with the Contractor's 'Construction Environmental Management Document' (CEMD) and incorporate any specific requirements of statutory authorities such as Scottish Water, the Scottish Environmental Protection Agency (SEPA) and THC.

Anticipated measures to be considered and developed within the CEMD include, but are not limited to:

- Exposed slopes will need to be protected from washout / run-off due to coastal flooding and/or heavy rainfall during construction;
- Washdown pint(s) to be self-contained areas with sump points to ensure washout from plant, such as concrete wagons, does not enter watercourses;
- Plant, equipment and material storage areas to be stored to prevent damage or pollution risk during flood events;
- Refuelling point(s) to be located and set up to prevent risk of pollution during heavy rainfall events.

Due to the anticipated locations of the Contractors site compound areas, it is likely that welfare facilities will be provided and serviced off-grid in the form of self-contained facilities that do not require connection to the existing water and wastewater networks.

2. Development Proposals

The site is located in the west of Scotland and lies within the Highland Council area. The Corran Narrows is the narrowest section of Loch Linnhe and is the location across which the Corran Ferry operates between Nether Lochaber on the East side of the loch and Ardgour on the West. Ferry infrastructure improvements are required on both sides to facilitate the introduction of a NEV.

2.1 Nether Lochaber

At Nether Lochaber, the existing ferry facility provisions and infrastructure will be retained and remain operational through the construction period of the new facilities. New infrastructure will be constructed on the foreshore approximately 250m North of the existing Site to allow for continuity of service through the construction period and resolve issues with lack of available areas to improve onshore marshalling and access facilities. Once the proposed works are operational, the ferry service will relocate to the new facility and the existing Nether Lochaber facilities will no longer service the Corran Ferry.

The planned infrastructure improvements primarily involve dredging of the seabed, a new slipway, a new breakwater with alignment structure, a new area of land reclamation for vehicle marshalling and a public parking area, with access road and road works to form a new junction connecting the site to the A82 and maintain connectivity to the shared-use footway/cycleway. These upgrades are designed to improve the safety, functionality, and operational efficiency of the ferry service.

New marshalling lanes of increased capacity and dedicated entrance and exit lanes will be formed within the marshalling area at the new site. This will be located on an area created by levelling the existing land and reclaiming an area from the adjacent foreshore. The levelled area is notably lower than the existing A82. As such there is a need to construct suitable slopes separating the elevations between the lower marshalling area and the higher verge along the western edge of the A82. Sections of the existing A82 will require localised re-alignment to ensure an appropriate road junction is constructed for vehicles accessing, egressing, and travelling through this new junction. The land reclamation will have rock armour revetment installed on the seaward faces where these are impacted by tidal forces. The area of land reclamation will also include car parking, bus stop, pursers' kiosk, cycle shelter, as well as new toilet and changing facilities. Surface water and foul water drainage networks are proposed to deal with surface water run-off and wastewater from the toilet facilities respectively.

2.2 Ardgour

On the Ardgour side of the crossing, the existing slipway and ferry offices will be retained and are unaffected by the works. The existing pier will be demolished to create space for the new infrastructure to be constructed. The planned infrastructure works involve dredging of the seabed, construction of a new slipway and a new berthing structure to provide overnight berthing and vessel charging. The scheme also includes localised road, footway, and marshalling improvements, and the formalising of residents and crew parking. A rock armoured revetment will be constructed between the pier and slipway along the extent of the road improvements. These upgrades are designed to enhance functionality and operational efficiency of the ferry service. A surface water drainage network is proposed to deal with surface water runoff.

Future phases of the development at Corran may include introduction of an additional NEV and potential improvements to the vehicle marshalling area at Ardgour, however, proposals for these potential elements have not been developed at this stage and are therefore not included in the proposed consentable works package.

3. Flood Risk Assessment

The FRA provides an assessment of current and future flood risk in relation to the proposed development, with appropriate consideration given to the predicted effects of climate change. The assessment outlines the mitigation measures incorporated within the scheme to ensure the risk of coastal flooding for the new infrastructure is managed for the lifetime of the development and does not exacerbate the current flood risk to existing receptors.

The flood risk assessment identifies potential sources of flooding, including:

- Coastal flooding due to the proximity to Loch Linnhe making is susceptible to tidal surges and sea level rise.
- Pluvial flooding from surface water during heavy rainfall events.
- Surface water flooding due to surcharging of man-made drainage systems.

3.1 Flood Levels

An extract from the SEPA Flood Maps is contained within Appendix A and indicate areas at risk from a flooding event that equates to a 10% likelihood of occurring in any given year (a 1 in 10 year flood event). The map shows that the low lying A861, including within Ardgour village and encompassing the existing ferry infrastructure on both sides of the crossing is at risk from extreme coastal flooding events. However, the area of the proposed works are not considered as at risk from river or surface water flooding by SEPA.

Advice provided by THC during the pre-application stage indicated that SEPA advised reference to the findings and levels derived from the Caol and Lochyside Flood Study (Circa 2017) as there have been previous concerns that the current Coast Flood Boundary (CFB) method used to derive design coastal flood levels underestimated flood risk in the area surrounding the site. Based on the assessments completed as part of this nearby flood prevention scheme, the Pre-Application Advice document for this project specified the levels that need to be considered for this scheme as part of a 1 in 200-year flood event at Corran. The figures advised are to consider a coastal still water flood level of Loch Linnhe of +6.65mCD (+4.69mOD), and a climate change allowance for the area should be an additional 0.86m. It is therefore considered that all new developments which are not classed as ‘water compatible use’ under the SEPA ‘Flood Risk and Land Use Vulnerability Guidance’ should be on land above +7.51mCD (+5.55mOD).

THC and SEPA also recommend a minimum 0.6m allowance for freeboard for any development which is used for overnight accommodation. This means that overnight accommodation should be constructed such that the finished floor level (FFL) is

above +8.11mCD (+6.15mOD). This advice is in line with the construction industry research and information association (CIRIA) guidance (CIRIA C624 Development and Flood Risk – Guidance for the Construction Industry 2004).

In accordance with SEPA's 'Flood Risk and Land Use Vulnerability Guidance' document, the infrastructure improvements are classed as 'Water Compatible Use'. The scheme does not include any proposed new overnight accommodation.

3.2 Coastal Flooding

Topographic surveys have been undertaken at both Nether Lochaber and Ardgour to establish ground levels in and around the sites. The levels have then been used to determine low-lying areas based on the flood level guidance provided by THC and SEPA.

3.2.1 Nether Lochaber

The existing ferry infrastructure and surrounding properties at Nether Lochaber were found to be prone to flooding each year. The proposed development on this side involves relocating the ferry operations further North to a new site formed by levelling the existing hillside and reclaiming a section of land along the coast. Although part of the new reclamation area will encroach on the coastal waterbody, the additional land and structures constructed as part of this scheme will have an indiscernible overall impact in exacerbating flood risk for others by increasing flood water levels. The area and volume of land reclamation is very small compared with the overall body of water within Loch Linnhe. As a result the increased displacement and resulting impact on the water levels within the loch due to the proposed works will be negligible. It is also worth noting that any impact is further ameliorated by the proposed reuse of adjacent dredge arisings as fill material for reclamation areas and infill to structures, as far as practicable.

Although the proposed development on the Nether Lochaber side is considered as 'water compatible use', the design has considered the flood level guidance with the aim of mitigating flood risk as far as practicable. To adequately protect the development from a 1 in 200-year coastal flood event, plus providing a suitable allowance for climate change and freeboard, the guidance recommended siting the development on land above +7.51mCD. The head of the slipway is at +7.0mCD and the start of the marshalling lanes area will have a ground level of approximately +8.5mCD. The proposed toilet facilities will have a FFL of approximately +9.2mCD which are both

comfortably above the recommended flood level and remove the risk of coastal flooding for the site.

3.2.2 Ardgour

The planned infrastructure improvement works at Ardgour primarily involve large civil works, such as the construction of a slipway and overnight berthing structure. These upgrades are designed to enhance functionality and operational efficiency of the ferry service and are classed as 'water compatible use' under the SEPA guidance.

Similarly to Nether Lochaber, the volume of the works to be installed at Ardgour is negligible compared with the overall volume of Loch Linnhe. Therefore, the works will have no discernible impact on the still water level of the loch and are unlikely to exacerbate coastal flooding.

The village of Ardgour is a low-lying area which has a road level of +5.6mCD to +6.2mCD in the area of the proposed Works (Between the Corran Ferry Offices and the Existing Slipway). The existing ground levels along the A861 which runs along the shorefront at Ardgour appear to rise to no more than +6.7mCD. Therefore, the shorefront area throughout Ardgour is typically situated below the 1 in 200 year coastal still water level of +7.51mCD (which incorporates a 0.86m allowance for sea level rise). Even without future factoring sea level rise, the 1 in 200-year flood event would reach levels of approximately +6.65mCD and therefore impact the A861 and shoreside areas running through Ardgour.

Properties along this road are primarily located on the landward side of the road and there is a significant risk that a proportion of these properties have FFLs that are below the recommended level of +8.11mCD. Properties considered at particular risk within Ardgour are the lighthouse cottage buildings and the Ardgour Inn as these are particularly low lying and located at the road edge.

Other properties on the A861, generally residential, are set back approximately 10m from the road edge on modestly sloped ground, rising landward. Nonetheless, these properties are still considered at risk during an extreme flood event, particularly if the impact of sea level rise due to global warming is realised.

The shoreside areas risk of coastal flooding was highlighted in October 2024 when Storm Ashley caused the still water level of Loch Linnhe to exceed the level of the road and encroach on soe of the properties along the Ardgour shorefront.

Table 1 presents tide data recorded by SEPA at the Corpach tide gauge (towards the North of Loch Linnhe) and provided to THC for the purposes of assessing the severity of Storm Ashley and flood risk to the local area. The level recorded at 20:00 on 20/10/2024 during Storm Ashley was the third highest on record (since 1992). Single site analysis of the tide gauge indicates that the event had an approximate 1 in 15-year return period.

Time and Date	Level (mCD)
19:30 on 11/01/2005	+6.389
08:15 on 30/12/2008	+6.312
20:00 on 20/10/2024	+6.012
06:30 on 24/12/1999	+5.902
20:15 on 13/01/2020	+5.892
07:45 on 04/01/1999	+5.653
08:30 on 03/01/1998	+5.531
20:15 on 10/01/1993	+5.499
09:15 on 09/11/1998	+5.485
09:00 on 10/02/2000	+5.465
08:30 on 31/03/1994	+5.448
09:00 on 09/11/1998	+5.445
06:45 on 19/09/2007	+5.412
07:00 on 22/03/2023	+5.397

Table 1 - Corpach Tide Gauge Recorded Levels

The recorded data during Storm Ashley shows that the still water level of the loch exceeded the level of the existing slipway and covered the A861 running through the village. Flood water also penetrated the entrance area to Ardgour Inn.

The proposed ferry infrastructure improvement scheme is not a flood prevention scheme and has therefore not been designed to address the risk of coastal flooding during an extreme flooding event. However, the development of the scheme has considered if the proposals have any potential to impact on the existing flood risk experienced by the local community

during an extreme flood event. As an absolute minimum, the design has ensured that the proposed works do not exacerbate the existing flood risk.

The proposed infrastructure at Ardgour ties into existing levels for the existing infrastructure, including the A861 and shorefront area. The top of the pier (+6.5mCD) and slipway (+6.7mCD) are at higher levels than the adjacent A861 infrastructure into which they connect and will therefore not create any low points for the still water level to get closer to shorefront properties. Constructed at a higher level, the structures will provide some enhanced localised protection from wave action and associated run-up in the event of an extreme flooding with associated wave action.

In addition, localised stone walling and rock armoured slopes along the seaward edge of the proposed formalised shore area will provide some protection against wave action during an extreme flood event through absorption of wave energy.

However, the proposed development is considered to have no beneficial impact on the overall still water levels that may be experienced at Ardgour during an extreme flood event. Still water levels during flood events will rise and penetrate this area due to the low lying nature of the A861 and foreshore throughout the village. The lowest point on the A861 is located at the head of the existing slipway and therefore during a flood event this will be the first location where flood water begins to encroach onto the A861.

To reduce the risk of coastal flooding at Ardgour, substantial flood prevention works would be required to provide suitable protection for the existing community infrastructure against extreme flood events. Provision of specific flood protection and mitigation measures for the local community are not within the scope of this project.

3.3 Surface Water Flooding

Surface water as a result of heavy rain (pluvial) events and subsequent overload of drainage systems is a potential source of flooding. To mitigate this form of flooding, surface water drainage networks have been designed for both sides of the development. The drainage systems have been designed and assessed for the safe passage of a 1 in 200-year rainfall event (0.5% annual exceedance probability), plus an allowance for climate change. Increases in rainfall intensity due to climate change are likely to result in an increase in the severity and frequency of flooding incidents. SEPA's document 'Climate change allowances for flood risk assessment in land use

planning' provides recommended allowances which can be used when calculating peak rainfall intensity and designing surface water management infrastructure. The guidance estimates a total change of 46% to the year 2080 for the 'Argyll' river basin region.

Section 4 of the report - 'Drainage Impact Assessment' provides detailed information on the designed surface water drainage networks for both Nether Lochaber and Ardgour. The design considerations and drainage solutions outlined in this section are deemed to be appropriate mitigation against surface water flooding.

During the operational phase of the scheme, THC will ensure that regular inspection and maintenance of drainage system is undertaken to remove debris, sediment and blockages which could impede the flow of water. In addition, interceptor tanks will be fitted with alarm systems and will require a routine maintenance regime to be developed and implemented.

4. Drainage Impact Assessment

The DIA has been prepared in accordance with THC guidance on flood risk and drainage impact. The primary aim of the assessment is to ensure the proposed drainage systems adequately manage surface water and foul water in line with current legislation and industry best practice.

4.1 Existing Drainage Characteristics

At present, all surface water run-off from the villages and existing ferry infrastructure drains into the Corran Narrows without undergoing any treatment.

At Nether Lochaber, foul water from the surrounding properties appears to flow downhill to a septic tank located near the existing toilet facility at the root of the existing slipway. An overflow outfall then discharges into the lower tidal foreshore, immediately south of the existing slipway.

Surface water (pluvial) drainage, including from the A82 and A861 appears to drain into adjacent watercourses before discharging into Loch Linnhe. Primary surface water courses are a burn that discharges adjacent to the North of the existing slipway and an additional, smaller, burn which runs down the North boundary of the further North property within the development on the Western side of the A82. Both burns transit below the A82 in culverts.

At Ardgour, combined drainage (including foul water) from existing properties flows to the shore outfall under gravity. To the North-West of the village, the foul flows are collected and pumped, via a rising main running along the line of the A861 to connect with the gravity foul network to the East of Ardgour Inn that discharges into Loch Linnhe below the tidal zone via a sea outfall located near the Lighthouse. The pumping manhole also includes an overflow outfall, discharging into the sea below the tidal zone.

Arrangements for the surface water (pluvial) flow at Ardgour is via gravity flow through the village with discharges directly onto the foreshore via localised outfall pipes through existing embankments or through existing retaining walls.

Several localised issues have been identified with the existing drainage arrangements around the Ardgour Inn that are proposed to be resolved as part of the Works:

- Discharge manhole for the rising main occasionally blocks causing backflows that affect the Ardgour Inn. This defect requires periodic jetting to clear the blockage.

- Surface water drainage outside the Ardgour Inn suffers blockages due to build up of sand at the outfall which discharges through the seawall to the East of the Existing Slipway.

4.2 Design - General

The proposed development will include the installation of surface water drainage networks (Nether Lochaber and Ardgour) and a new foul water drainage network (Nether Lochaber only). However, since the proposed works at Nether Lochaber are being constructed at a separate site, to the North of the existing community, the surface water and foul water arrangements are almost entirely separate from the existing infrastructure.

4.2.1 Surface Water

The surface water drainage networks have been designed to accommodate a 1 in 200-year return period rainfall event, plus a 46% allowance for climate change based on guidance provided by SEPA (Refer Section 3.3). The topography and development of the sites have been carefully considered to ensure that suitable falls / gradients are provided to facilitate successful surface water management.

Discharge of surface water, where existing networks or arrangements are not available due to the development or drainage areas have increased significantly, are designed, and constructed with new drainage arrangements.

New drainage systems are designed to include for treatment within a full retention separator prior to discharging into Loch Linnhe via an outfall pipe fitted with a non-return valve.

The proposed drainage arrangements and identification of permeable and impermeable (hardstanding) areas are highlighted on the layout drawings contained within Appendix B. Detailed design calculations for the surface water drainage networks are presented in Appendix C.

4.2.2 Foul Water

The foul water drainage network at Nether Lochaber has been designed as far as reasonably practicable in accordance with the ‘Sewerage Design’ guidance contained within ‘Sewers for Scotland v4.0’. It is required to deal with foul

flows from the new toilet facility to be constructed within the marshalling area.

There doesn't appear to be relevant industry guidance on the assessment of usage of toilet facilities at ferry terminals where passengers are only on site for a short period, whilst waiting for a very regular ferry service. Due to the nature of the Corran Ferry service it is considered that design guidelines published by Network Rail titled 'Public toilets in managed stations – capacity and user groups' provide the most relevant guidance. Therefore, taking account of the Network Rail guidance, the operating period of the Corran Ferry and Office of National Statistics (ONS) data for car/van occupancy, the usage of the toilet facilities have been estimated. Using the estimated usage, the design flow rate through the foul water system has been calculated using the flow and load data provided by British Water in the Code of Practice, 'Sizing criteria, treatment capacity for sewage treatment systems'.

The proposed foul water drainage network is shown on the layout drawings contained within Appendix D. Detailed design calculations for the foul water drainage network are presented in Appendix E.

4.3 Design - Nether Lochaber

4.3.1 Surface Water Networks

The proposed surface water drainage network at Nether Lochaber incorporates Sustainable Drainage Systems (SuDS) in the form of filter drains and reinstated topsoil areas. SuDS are primarily to manage surface water to convey, attenuate and allow infiltration to mitigate water quality and flooding issues downstream. However, for this development, surface water discharge from proposed new areas will be directly into the adjacent Loch Linnhe and so applying all the principles of SuDS are not directly relevant in this case. Appropriate drainage solutions have been identified and developed for the scheme. Due to the traffic volumes and extensive paved (hardstanding) areas for vehicle marshalling and car parking etc., traditional drainage solutions, such as gullies and kerb drains are proposed to manage the high flow rates effectively.

Due to the size of the Nether Lochaber development, it has been necessary to have two separate drainage networks. Network A will collect most of the surface water draining from the adjacent A82, whilst Network B will collect

the remaining A82 drainage in addition to the new reclamation area that makes up the new ferry terminal.

The widened and adjusted section of the existing A82, new road junction and marshalling area will be drained via kerb drains. The proposed 'Beany Block' drainage kerb from Marshalls combines water interception and transportation in one system and can be installed on flat or steep gradients, making it suitable for accommodating both existing and proposed site levels.

Surface water in the car parking area will be drained by road gullies. The proposed gradients and crossfalls in this area have been carefully considered to ensure the gullies are spaced out and positioned to adequately collect water without allowing substantial quantities to remain on the road surface. Table 1 below provides recommendations from THC 'Road and Transport Guidelines for New Developments' on gully spacings based on varying carriageway gradients and crossfalls.

		Gradient							
		Flatter than 1/150 0.66%	1/150 0.66%	1/100 1.00%	1/80 1.25%	1/60 1.66%	1/40 2.50%	1/30 3.33%	1/20 5.00%
Cross Section	**C/way width**	**Gully Spacing (metres)**							
1 in 40	5.5 m	20	30	35	40	45	55	60	75
(2.5%)	6.0m	20	25	30	35	40	50	60	70
Camber	7.3m	15	20	25	30	35	40	45	55
1 in 40	5.5m	10	15	17	20	22	27	30	37
(2.5%)	6.0m	10	12	15	17	20	25	30	35
Crossfall	7.3m	7	10	12	15	17	20	22	27

Table 2 - Gully Spacings for Carriageways

The car parking area is approximately 11.5m wide with a longitudinal gradient of 1.4% and crossfall of 2.5%. Based on the guidance contained in the above table the recommended gully spacing should be 15m. As the car parking area is wider than the maximum provided carriageway width, the proposed gully spacing has been reduced, now being typically spaced at approximately 12m centres along the edge of the parking area. This gully spacing means that each gully is draining a catchment significantly less than the 200m^2 area suggested within THC guidance for draining irregularly shaped areas.

Runoff from the slopes separating the elevations of the reclamation area and the widened western edge of the A82 (to accommodate the new junction), at

the interface with the new ferry terminal area, will be captured by filter drains at the base of the slope and along the landward edge of the reclamation. A perforated plastic pipe will be installed within an overlying gravel filter layer, which will provide some runoff storage prior to entering the drainage network. The filter drain will conform with guidance on filter drain trench and bedding details outlined in the 'Standards for Highways', 'F-series – Drainage'.

Elsewhere, run-off from the relatively narrow shared use footway / cycleway to the new ferry terminal will be permitted to run-off the bound surfaced areas and percolate into surrounding granular slope areas. From here it will find its way into existing watercourses, in an equivalent manner to current run-off in these areas.

At the level section along the head of the slipway a linear drainage system, in the form of a channel drain, will be installed to intercept and direct runoff away from the slipway. The 'Birco' channel drain system by Marshalls is proposed as it is suitable for heavy traffic loading and is available with inbuilt falls to improve flow rate and increase discharge capacity.

To prevent water ingress and keep entryways dry, surface water will be captured and diverted away from the entrances to the toilet facilities using linear drainage in the form of threshold drains which will be installed directly outside the door opening of the building. The proposed 'ACO Threshold Drain' (or similar accepted alternative) is suitable for pedestrian traffic and provides a discrete drainage solution.

The various drainage elements discussed above will each have outlets which allow connection into the surface water drainage system via a standard Unplasticized Polyvinyl Chloride (uPVC) pipe network. The carrier pipework has been designed to the HR Wallingford 'Tables for the hydraulic design of pipes, sewers, and channels', using a roughness coefficient (k_s) of 0.06mm, the incoming flow rate and required pipe gradient. Pipework gradients have been limited to 1 in 100.

Precast concrete manhole chambers are provided throughout each network to facilitate the inspection, maintenance, and accessibility of the drainage pipes. The manholes are situated at key points in the networks, such as pipe junctions, changes in direction, or changes in pipe diameter or gradient.

As the marshalling and parking areas will primarily be used by vehicles, there is a risk of contamination of surface water runoff due with oil and/or risk of larger spills. To adequately treat the surface water and remove contaminants prior to discharge, the two drainage networks will include full retention separators at the end of the systems. Single chamber SPEL Puraceptor Class 1 full retention separators (or similar accepted alternative) are proposed. The separators will be fitted with an automatic closure device (ACD) to close off the separator when the contained oil exceeds the maximum oil storage. The separators have been sized based on the working capacity plus fuel/oil and silt containment ensuring optimum performance between maintenance periods. The size of the separators can be found on the drawings and schedules contained within the Appendices.

After transitting through the separators, which are designed to intercept debris / silt and oil, the surface water will discharge to Loch Linnhe via an outfall pipe connected to a precast concrete headwall system set within the proposed rock armoured revetments. As the outfall pipe extends through the rock armour, the pipe will be protected from damage by a concrete surround.

Due to the coastal location of the site, outfalls will be installed with non-return valves at the end of the drainage system to prevent backflow of water into the system which could lead to flooding (backing up) of upstream areas. Although the outfall pipes at Nether Lochaber will be situated above the current highest astronomical tide (HAT) of +4.9mCD (Network A = approx. +8.7mCD and Network B = approx. +5.5mCD), the installation of non-return valves will future proof the networks and provide protection against extreme coastal flooding conditions.

4.3.2 Foul Water Network

A foul water drainage network is required at Nether Lochaber. The network will pick up the foul drainage outlets installed within the proposed toilet facilities building for collecting wastewater from the outlets such as toilets, urinals, wash hand basins and shower. The captured wastewater will be transported via a uPVC carrier pipe and manhole system from the building to a suitably sized package sewage treatment plant located near the slipway, prior to discharge to Loch Linnhe. Sizing of the package plant has been determined based on the number of fixtures and fittings contained within the new toilet facilities and conservative estimates of usage rates. The foul water outfall pipe will be installed within a precast concrete headwall set within the proposed rock armour revetment at the south end of the site. The foul water

network will be below the surface water network in the areas which they cross. The pipe network complies with the minimum pipe size and gradient set out in the 'Sewers for Scotland v4.0' guidance.

Sewage treatment will be provided in the form of the Klargester BioDisc large sewage treatment plant, which is a single packaged system, designed to achieve effluent quality of 20mg/l biochemical oxygen demand over a 5-day test period (BOD5), 30mg/l Suspended Solids and 20mg/l Ammonia. The unit is formed using structurally strong Glass Reinforced Plastic (GRP) and has fully removable covers for ease of maintenance.

Due to the coastal location of the site, a non-return valve will be installed to prevent backflow of water. Although the outfall pipe will be situated above HAT, the installation of a non-return valve will future proof the network and provide protection against extreme coastal flooding events.

4.4 Design - Ardgour

4.4.1 Surface Water

There is one surface water drainage network proposed for Ardgour.

The proposed drainage network will be formed using a combination of channel drains and gullies which will collect surface water drainage from the localised section of road and footway improvements along the shore between the entrances to the existing slipway and the proposed overnight berthing structure.

As for Nether Lochaber, the application of the principals of SuDS on this side of the crossing was not deemed suitable due to the development only requiring drainage for small, discreet areas which require high flow rates to be managed effectively and discharged directly into the adjacent Loch Linnhe.

Other areas impacted by the works include the field area which will accommodate power infrastructure and unbound vehicle access arrangements for maximum of weekly deliveries. Details of surface water drainage for this area are outlined later within this section.

4.4.2 Surface Water – Network

Surface water along the proposed car parking area and adjacent footways will be drained by road gullies. The proposed gradients and crossfalls in this area have been carefully considered to ensure the gullies are spaced out and positioned to adequately collect water without allowing substantial quantities to remain on the road surface.

The existing A861 road over the length of the site is 6m wide with a longitudinal gradient of approximately 0.6% and crossfall of 2.5%. Based on the guidance contained in Table 1, the recommended gully spacing in this area should be 10m. A typical gully spacing of 10m has been applied in the design over the length of the proposed roadside parking, where each gully will drain an area of both the carriageway and realigned footway. Based on the implemented gully spacing, each gully has a catchment area significantly less than the 200m^2 area suggested within THC guidance for draining irregularly shaped areas.

At the entrance to the new overnight berthing structure and at the head of the new slipway, a linear drainage system in the form of a channel drain will be installed to intercept surface water runoff. The 'Birco' channel drain system by Marshalls is proposed as it is suitable for heavy traffic loading and is available with inbuilt falls to improve flow rate and increase discharge capacity.

The gullies and channel drains will connect into the surface water drainage system via a standard UPVC pipe network. The carrier pipework has been sized with reference to the HR Wallingford 'Tables for the hydraulic design of pipes, sewers, and channels', using a roughness coefficient (k_s) of 0.06mm, the incoming flow rate and required pipe gradient. Pipe gradients have been limited to 1 in 100.

Precast concrete manhole chambers are provided throughout the network to facilitate the inspection, maintenance, and accessibility of the drainage pipes. The manholes are situated at key points in the network, such as pipe junctions, changes in direction, or changes in pipe diameter or gradient.

As the area of the site being drained will primarily be used by vehicles, there is a risk of contamination of surface water run-off due with oil and/or risk of larger spills. To adequately treat the surface water and remove contaminants prior to discharge, the drainage network will include a full retention separator at the end of the system. A single chamber SPEL Puraceptor Class 1 full retention separator (or similar accepted alternative) is proposed. The separator

will be fitted with an ACD to close off the separator when the contained oil exceeds the maximum oil storage. The separator has been sized based on the working capacity plus fuel/oil and silt containment ensuring optimum performance between maintenance periods. The size of the separator can be found on the drawings and schedules contained within the Appendices.

After treatment by the separator, the surface water will be discharged to Loch Linnhe via an outfall pipe connected to a precast concrete headwall system set within the proposed rock armoured revetments. As the outfall pipe extends through the rock armour, the pipe will be protected from damage by a concrete surround.

Design solutions have been developed to keep outfall locations as high as possible to avoid risk of locking the system and minimise the risk of upstream flooding. The invert level of the outfall pipe for the surface water network at Ardgour is approximately +4.0mCD which is within the tidal range for the site (i.e. below Mean High Water Springs (MHWS) of +4.4mCD). This means that there may be limited periods when the system will not be able to fully discharge due to extreme high still water levels (typically above MHWS), and water will therefore require to be temporarily held within the system. In the event of prolonged locking of the system resulting from an extreme flooding event, rainwater may ultimately emerge from gullies and linear drainage units and find its way to the immediately adjacent Loch Linnhe. To prevent backflow of water into the system, the downstream section of the outfall pipe will be fitted with a non-return valve.

4.4.3 Surface Water – Field Area

The field area includes discrete elements of infrastructure which will accommodate power infrastructure and unbound vehicle access. Details of surface water drainage proposals are outlined below.

- Vehicle Access – Vehicle access and access areas around the infrastructure are proposed with unbound surfacing. No formal drainage is proposed. Surface water will run off into surrounding free-draining gravel overburden.
- Sub-Station / Switch-Room Building – Approximately 8m by 5m in footprint, surface water from roof proposed to discharge direct onto surrounding free-draining gravel overburden. In the event of build up of water within the cable pit, a localised sump and access for pumping out the pit by a suitable tanker is provided at the external edge of the building.

- Generator and Fuel Tank – Mounted on a localised concrete slab area, these elements of equipment are integrally bunded. As a result, surface water from the slab is proposed to free drain directly into the surrounding gravel overburden.

4.4.4 Surface Water – Ardgour Inn

The outfall that currently discharges to the shore at the East of the Existing Slipway is proposed to be exposed and redirected to discharge through the new retaining wall located between the existing and new Slipways. This area of foreshore does not suffer from build of sand and should permit the drainage for this area to remain free draining.

4.4.5 Foul Water Network

There is no requirement for additional foul water drainage on the Ardgour side of the crossing.

The pumping rising main discharge manhole, located to the East of the Ardgour Inn car park, adjacent to the A861 will be reviewed and measures implemented to reduce the risk of blockages within this manhole as part of the proposed Works.

5. Conclusions

The infrastructure improvement project for the Corran Ferry is essential to improve the long-term viability and efficiency of this critical transport link.

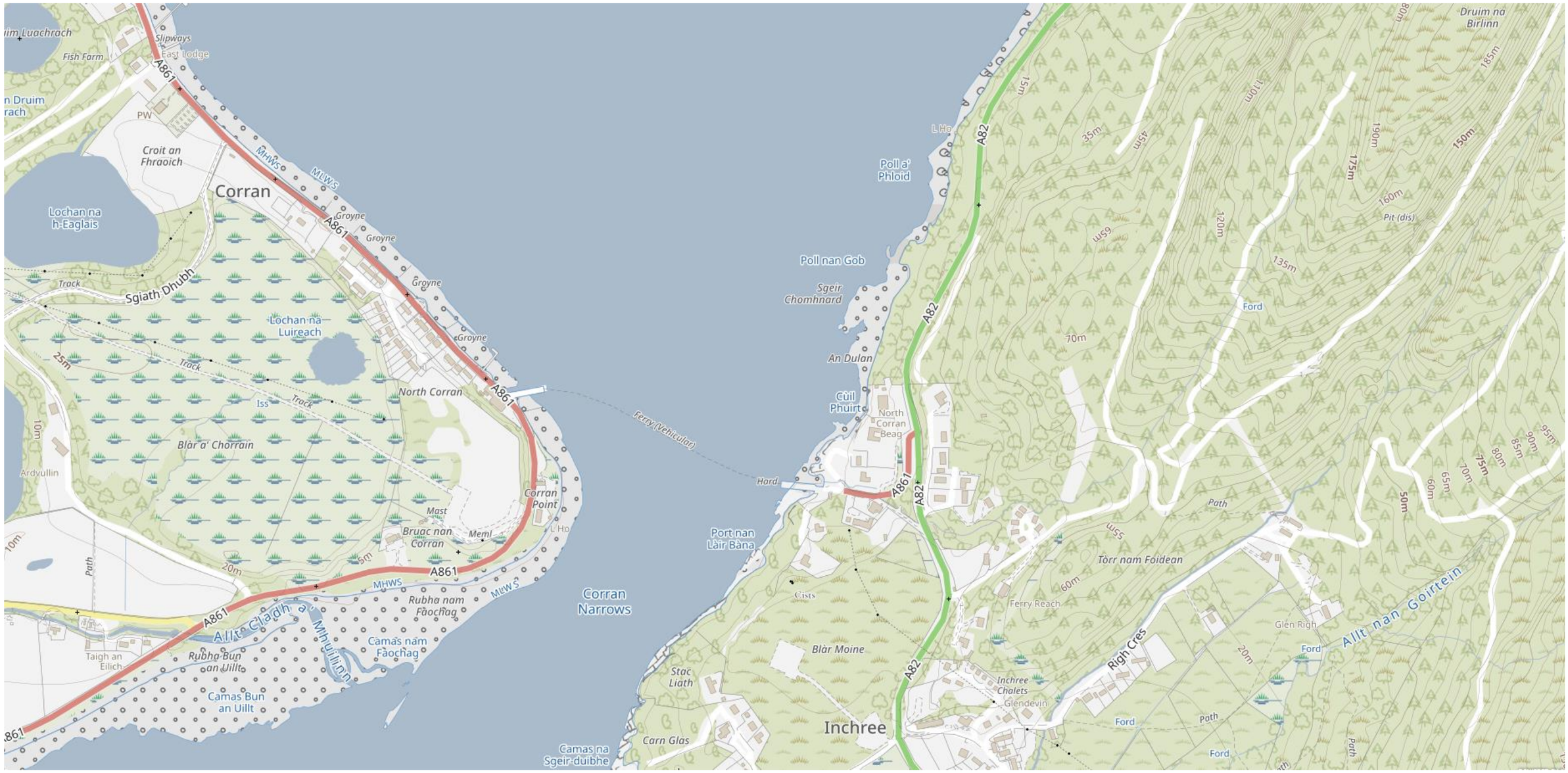
The FRA component has evaluated the potential sources of flooding for the site, identifying flood prone areas and outlining how the design has considered future flood levels. The assessment considered flood levels and guidance from a recent flood study to inform the design process and consider the infrastructure's resilience to potential flood events with appropriate allowances applied to account for climate change. Whilst flood risk has been minimised on the Nether Lochaber side of the crossing where the ferry infrastructure is being located to an entirely new site, the provision of measures which will reduce flood risk at Ardgour is beyond the scope of the project. However, the infrastructure improvement works on the Ardgour side will not exacerbate flood risk for the surrounding area but may provide protection from wave action as a result of the slipway and pier structure having a higher crest than the connecting land. Based on the findings of the FRA and the design considerations at Nether Lochaber, it is the author's opinion that the improvements comply with current flood risk legislation and policies as the development does not exacerbate flooding for others and is classed as 'water compatible use' in accordance with SEPA's 'Flood Risk and Land Use Vulnerability Guidance' document and can therefore be in areas that are at risk of flooding.

The DIA section of this report focused on ensuring that the surface water and foul water drainage networks have been designed in accordance with current legislation and best practices. The primary aim was to outline how these networks will manage water efficiently, minimising the risk of pollution and potential flood risk as a result of the systems being overwhelmed.

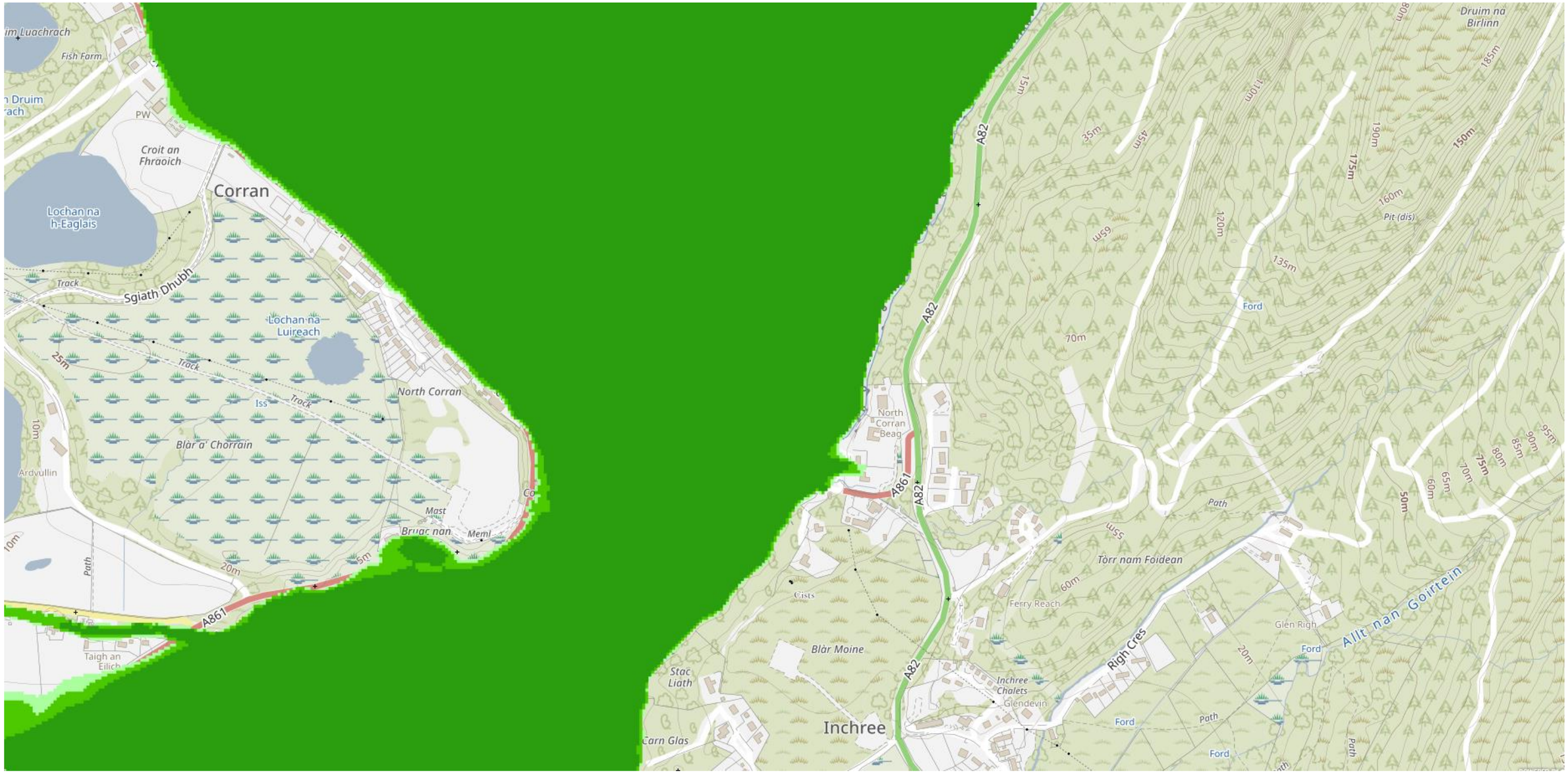
In conclusion, this report demonstrates that the proposed development has been designed with careful consideration of both flood risk and drainage impacts.

Appendix A – SEPA Flood Risk Maps

SEPA Flood Map – No Flood Map Shown



SEPA Flood Map – Coastal Flooding



High Likelihood

Each year this area has a 10% chance of flooding.

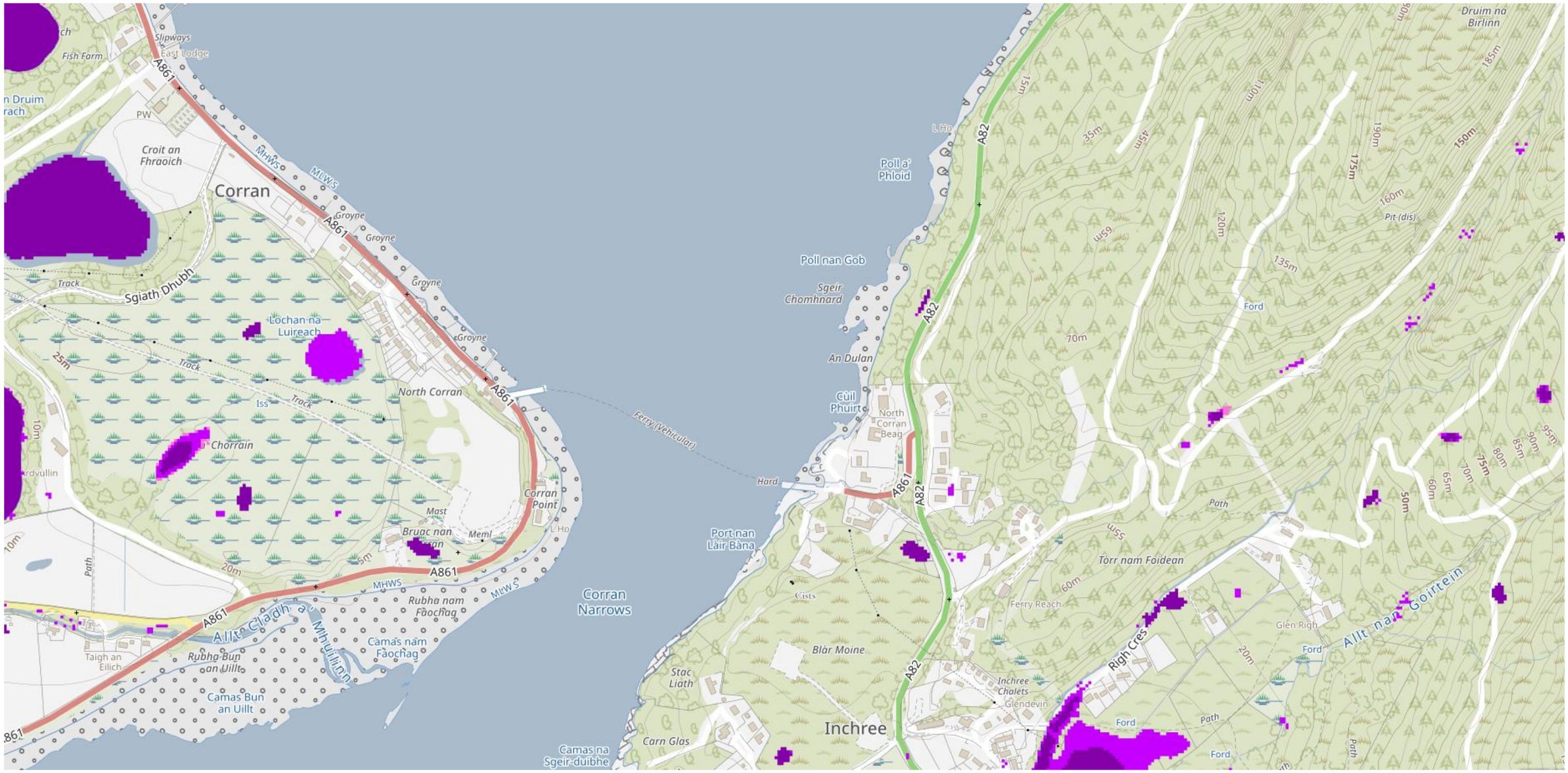
Medium Likelihood

Each year this area has a 0.5% chance of flooding.

Low Likelihood

Each year this area has a 0.1% chance of flooding.

SEPA Flood Map – Surface Water Flooding



High Likelihood

Each year this area has a 10% chance of flooding.

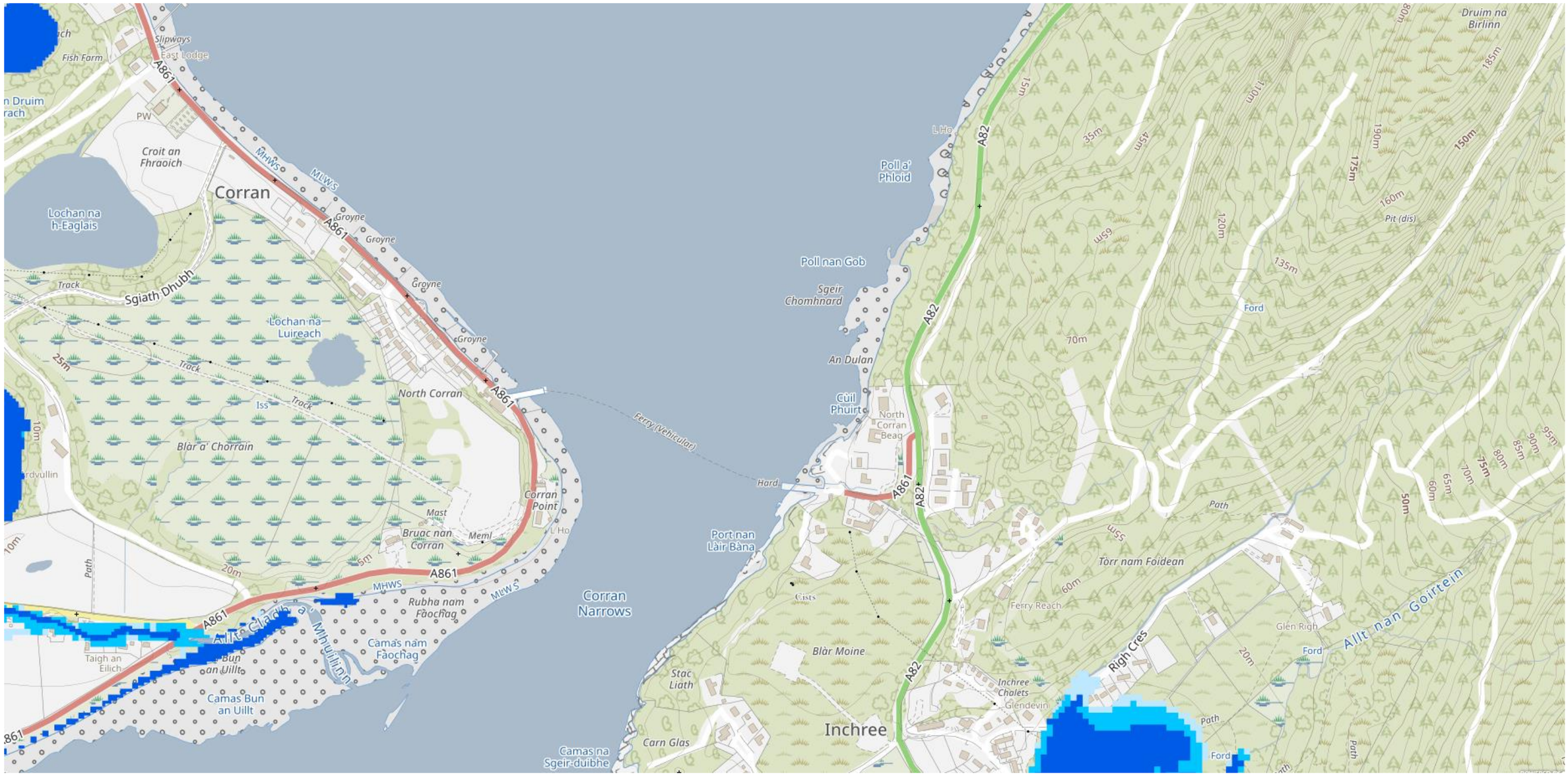
Medium Likelihood

Each year this area has a 0.5% chance of flooding.

Low Likelihood

Each year this area has a 0.1% chance of flooding.

SEPA Flood Map – River Flooding



High Likelihood

Each year this area has a 10% chance of flooding.

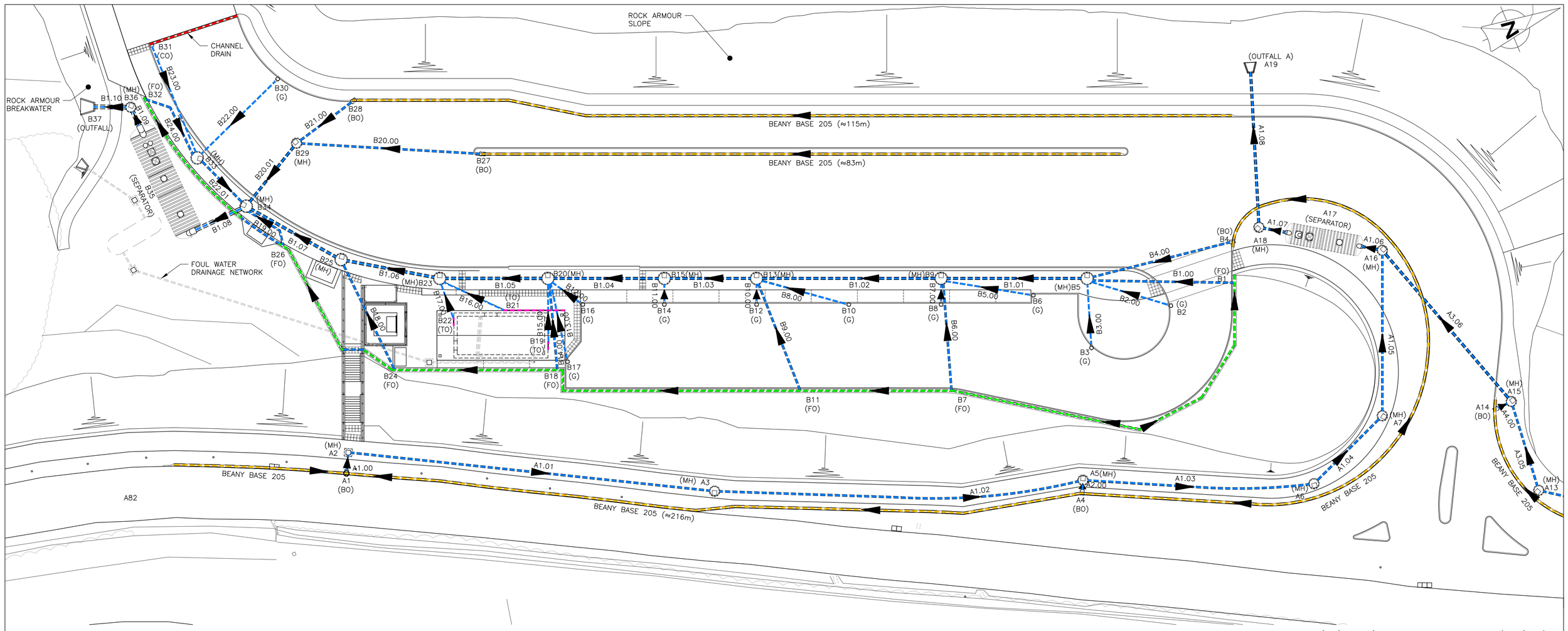
Medium Likelihood

Each year this area has a 0.5% chance of flooding.

Low Likelihood

Each year this area has a 0.1% chance of flooding.

Appendix B – Surface Water Drainage Layouts



REV	DATE	DETAILS	DRAWN	CHK'D	APP'D

AMENDMENTS

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES RELATIVE TO CHART DATUM UNLESS NOTED OTHERWISE.
3. CHART DATUM IS 1.96m BELOW ORDNANCE DATUM.
4. TIDE LEVELS ARE AS FOLLOWS:

HAT	+4.9mCD
MHWS	+4.4mCD
MHWN	+3.3mCD
MLWN	+1.7mCD
MLWS	+0.7mCD
LAT	0.0mCD

5. DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SCHEDULES IN THE SET.
6. FOR FOUL WATER DRAINAGE LAYOUT REFER TO DRAWING NUMBER 2387–WS–ZZ–NL–DR–C–5307.

LEGEND:

MH – MANHOLE
BO – BEANY KERB OUTLET
FO – FILTER DRAIN OUTLET
G – ROAD GULLY
TO – THRESHOLD DRAIN OUTLET
CO – CHANNEL DRAIN OUTLET
– BEANY BASE
– FILTER DRAIN
– CHANNEL DRAIN
– THRESHOLD DRAIN
– CARRIER PIPE
– FLOW DIRECTION

CLIENT: The Highland Council – Comhairle na Gaidhealtachd

PROJECT: CORRAN FERRY REDEVELOPEMNT

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DRAWING TITLE: NETHER LOCHABER PROPOSED SURFACE WATER DRAINAGE LAYOUT SHEET 1

DRAWN	CHECKED	APPROVED
PM	JA	BP
DATE: DEC 24	DATE: 15.01.25	DATE: 15.01.25
SCALE (A1): 1:250	STAGE: PRELIMINARY	REV: P01

DRAWING No.: 2387–WS–ZZ–NL–DR–C–5301

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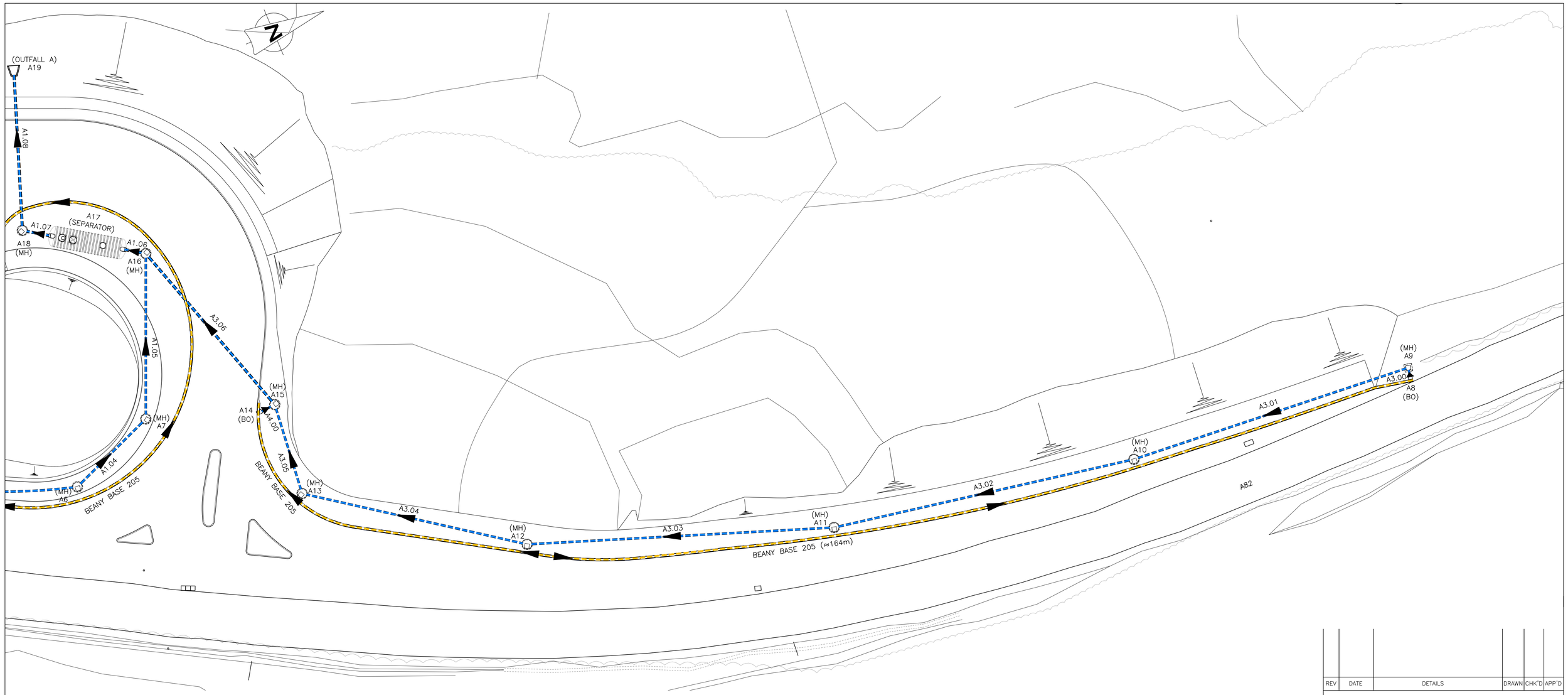

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MLWS	+0.7mCD
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5. DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SCHEDULES IN THE SET.
6. FOR FOUL WATER DRAINAGE LAYOUT REFER TO DRAWING NUMBER 2387–WS–ZZ–NL–DR–C–5307.

LEGEND:

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BO – BEANY KERB OUTLET
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TO – THRESHOLD DRAIN OUTLET
CO – CHANNEL DRAIN OUTLET
– BEANY BASE
– FILTER DRAIN
– CHANNEL DRAIN
– THRESHOLD DRAIN
– CARRIER PIPE
– FLOW DIRECTION

REV	DATE	DETAILS	DRAWN	CHK'D	APP'D

AMENDMENTS

CLIENT
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Comhairle na Gaidhealtachd

PROJECT
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DRAWING TITLE
NETHER LOCHABER PROPOSED SURFACE WATER DRAINAGE LAYOUT SHEET 2

DRAWN	CHECKED	APPROVED
PM	JA	BP
DATE	DATE	DATE
DEC 24	15.01.25	15.01.25

SCALE (A1)	STAGE	REV
1:250	PRELIMINARY	P01

DRAWING No.
2387–WS–ZZ–NL–DR–C–5302

SURFACE WATER – DRAINAGE NETWORK A

DRAINAGE ELEMENTS						INCOMING PIPES			OUTGOING PIPES		
REF	EASTING	NORTHING	TYPE	COVER/FRAME TYPE	COVER LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)
A1	202308.530	763794.828	BEANY KERB OUTLET	BEANY ACCESS COVER	12.590	–	–	–	A1.00	225	11.852
A2	202306.115	763796.108	675x675 MH – TYPE C	C250	12.636	A1.00	225	11.765	A1.01	225	11.740
A3	202329.379	763838.009	1200ø MH – TYPE B	C250	12.887	A1.01	225	11.269	A1.02	225	11.244
A4	202348.333	763881.902	BEANY KERB OUTLET	BEANY ACCESS COVER	12.960	–	–	–	A2.00	225	12.222
A5	202346.785	763882.682	1200ø MH – TYPE B	C250	13.031	A1.02 A2.00	225 225	10.775 12.157	A1.03	225	10.750
A6	202358.956	763910.152	1200ø MH – TYPE B	C250	12.732	A1.03	225	10.461	A1.04	225	10.436
A7	202354.307	763921.793	1200ø MH – TYPE B	C250	12.244	A1.04	225	10.323	A1.05	225	10.298
A8	202414.038	764075.214	BEANY KERB OUTLET	BEANY ACCESS COVER	11.920	–	–	–	A3.00	225	11.182
A9	202412.375	764075.560	675x675 MH – TYPE C	C250	12.016	A3.00	225	11.151	A3.01	225	11.126
A10	202409.383	764038.064	1200ø MH – TYPE B	C250	12.317	A3.01	225	10.722	A3.02	225	10.697
A11	202402.299	763998.696	1200ø MH – TYPE B	C250	12.775	A3.02	225	10.309	A3.03	225	10.284
A12	202388.702	763961.078	1200ø MH – TYPE B	C250	13.234	A3.03	225	9.896	A3.04	225	9.871
A13	202371.183	763936.725	1200ø MH – TYPE B	C250	13.154	A3.04	225	9.583	A3.05	225	9.558
A14	202359.300	763935.585	BEANY KERB OUTLET	BEANY ACCESS COVER	12.920	–	–	–	A4.00	225	12.182
A15	202359.151	763937.962	1200ø MH – TYPE B	C250	12.966	A3.05 A4.00	225 225	9.448 11.965	A3.06	300	9.423
A16	202334.518	763930.196	1200ø MH – TYPE B	C250	11.890	A1.05 A3.06	225 300	10.095 9.177	A1.06	350	9.152
A17	SEE DETAIL DRAWING		SPEL P150 1C/1SC	C250	VARIES	A1.06	350	9.130	A1.07	350	9.030
A18	202325.484	763916.590	1200ø MH – TYPE B	C250	10.789	A1.07	350	9.001	A1.08	350	8.976
A19	202306.483	763923.484	OUTFALL	–	–	A1.08	350	8.780	–	–	–

GENERAL NOTES

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   MLWN +1.7mCD
   MLWS +0.7mCD
   LAT 0.0mCD
5. DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SCHEDULES IN THE SET.
6. FOR FOUL WATER DRAINAGE LAYOUT REFER TO DRAWING NUMBER 2387–WS–ZZ–NL–DR–C–5307.

REV	DATE	DETAILS	DRAWN	CHK'D	APP'D

AMENDMENTS

CLIENT

The Highland Council
Comhairle na Gaidhealtachd

PROJECT

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DRAWING TITLE

NETHER LOCHABER PROPOSED SW DRAINAGE NETWORK A SCHEDULE

DRAWN	CHECKED	APPROVED
PM	JA	BP
DATE: DEC 24	DATE: 15.01.25	DATE: 15.01.25
SCALE (A1): AS SHOWN	STAGE: PRELIMINARY	REV: P01

DRAWING No.
2387–WS–ZZ–NL–DR–C–5303

SURFACE WATER – DRAINAGE NETWORK B

DRAINAGE ELEMENTS						INCOMING PIPES			OUTGOING PIPES		
REF	EASTING	NORTHING	TYPE	TYPE	COVER LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)
B1	202330.835	763910.749	FILTER DRAIN OUTLET	–	10.500	–	–	–	B1.00	225	9.900
B2	202330.377	763902.066	GULLY	D400	10.415	–	–	–	B2.00	150	9.665
B3	202331.396	763890.413	GULLY	D400	10.488	–	–	–	B3.00	150	9.738
B4	202325.866	763912.830	BEANY KERB OUTLET	BEANY ACCESS COVER	10.500	–	–	–	B4.00	225	9.762
B5	202322.863	763893.427	1500ø MH – TYPE B	C250	10.341	B1.00 B2.00 B3.00 B4.00	225 150 150 225	8.982 9.152 9.348 8.535	B1.01	300	8.510
B6	202322.152	763886.124	GULLY	D400	9.978	–	–	–	B5.00	150	9.228
B7	202329.293	763871.521	FILTER DRAIN OUTLET	–	9.964	–	–	–	B6.00	225	9.226
B8	202318.566	763874.610	GULLY	D400	9.652	–	–	–	B7.00	150	8.902
B9	202315.436	763875.939	1500ø MH – TYPE B	C250	9.691	B1.01 B5.00 B6.00 B7.00	300 150 225 150	7.635 8.678 8.535 8.687	B1.02	300	7.610
B10	202313.875	763863.564	GULLY	D400	9.437	–	–	–	B8.00	150	8.687
B11	202321.599	763853.38	FILTER DRAIN OUTLET	–	9.638	–	–	–	B9.00	225	9.038
B12	202309.185	763852.519	GULLY	D400	9.351	–	–	–	B10.00	150	8.601
B13	202306.055	763853.848	1500ø MH – TYPE B	C250	9.390	B1.02 B8.00 B9.00 B10.00	300 150 225 150	7.160 8.313 8.298 8.171	B1.03	300	7.135
B14	202304.495	763841.474	GULLY	D400	9.265	–	–	–	B11.00	150	8.515
B15	202301.365	763842.803	1500ø MH – TYPE B	C250	9.304	B1.03 B11.00	300 150	6.925 8.085	B1.04	300	6.900
B16	202300.351	763831.717	GULLY	D400	9.187	–	–	–	B12.00	150	8.437
B17	202306.409	763826.972	GULLY	D400	9.187	–	–	–	B13.00	150	8.437
B18	202306.768	763825.376	FILTER DRAIN OUTLET	–	9.277	–	–	–	B14.00	225	8.677
B19	202303.111	763825.679	THRESHOLD DRAIN OUTLET	LOAD CLASS A15	9.192	–	–	–	B15.00	110	8.792
B20	202295.445	763828.862	1500ø MH – TYPE B	C250	9.168	B1.04 B12.00 B13.00 B14.00 B15.00	300 150 150 225 110	6.627 7.994 7.942 7.936 7.848	B1.05	350	6.602
B21	202296.993	763821.981	THRESHOLD DRAIN OUTLET	LOAD CLASS A15	9.192	–	–	–	B16.00	110	8.792
B22	202295.407	763815.521	THRESHOLD DRAIN OUTLET	LOAD CLASS A15	9.192	–	–	–	B17.00	110	8.792
B23	202289.946	763815.912	1500ø MH – TYPE B	C250	8.984	B1.05 B16.00 B17.00	350 110 110	6.477 7.721 7.847	B1.06	350	6.452

SURFACE WATER – DRAINAGE NETWORK B CONTINUED

DRAINAGE ELEMENTS						INCOMING PIPES			OUTGOING PIPES		
REF	EASTING	NORTHING	TYPE	COVER/FRAME TYPE	COVER LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)
B24	202298.492	763805.859	FILTER DRAIN OUTLET	–	9.042	–	–	–	B18.00	225	8.442
B25	202282.686	763805.060	1500ø MH – TYPE B	C250	8.719	B1.06 B18.00	350 225	6.336 6.934	B1.07	350	6.311
B26	202277.996	763798.851	FILTER DRAIN OUTLET	–	8.595	–	–	–	B19.00	225	7.995
B27	202277.289	763827.468	BEANY KERB OUTLET	BEANY ACCESS COVER	8.500	–	–	–	B20.00	225	7.762
B28	202264.281	763814.751	BEANY KERB OUTLET	BEANY ACCESS COVER	7.950	–	–	–	B21.00	225	7.212
B29	202266.494	763805.634	1200ø MH – TYPE B	D400	7.885	B20.00 B21.00	225 225	6.598 6.382	B20.01	300	6.357
B30	202257.842	763806.643	GULLY	D400	7.500	–	–	–	B22.00	150	6.750
B31	202247.315	763793.265	CHANNEL DRAIN OUTLET	E600	7.000	–	–	–	B23.00	150	6.627
B32	202253.586	763789.812	FILTER DRAIN OUTLET	–	7.403	–	–	–	B24.00	225	6.803
B33	202263.195	763792.997	1500ø MH – TYPE B	C250	7.865	B22.00 B23.00 B24.00	150 150 225	6.482 6.330 6.130	B22.01	225	6.105
B34	202271.462	763796.408	1500ø MH – TYPE B	C250	8.286	B1.07 B19.00 B20.01 B22.01	350 225 300 225	6.184 7.326 6.266 5.956	B1.08	500	5.931
B35	SEE DETAIL DRAWING		SPEL P400 1C/1SC	C250	VARIES	B1.08	500	5.800	B1.09	500	5.700
B36	202253.758	763787.609	1200ø MH – TYPE B	C250	7.572	B1.09	500	5.660	B1.10	500	5.635
B37	202251.825	763783.194	OUTFALL	–	–	B1.10	500	5.548	–	–	–

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   LAT 0.0mCD
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6. FOR FOUL WATER DRAINAGE LAYOUT REFER TO DRAWING NUMBER 2387–WS–ZZ–NL–DR–C–5307.

REV	DATE	DETAILS	DRAWN	CHK'D	APP'D

AMENDMENTS

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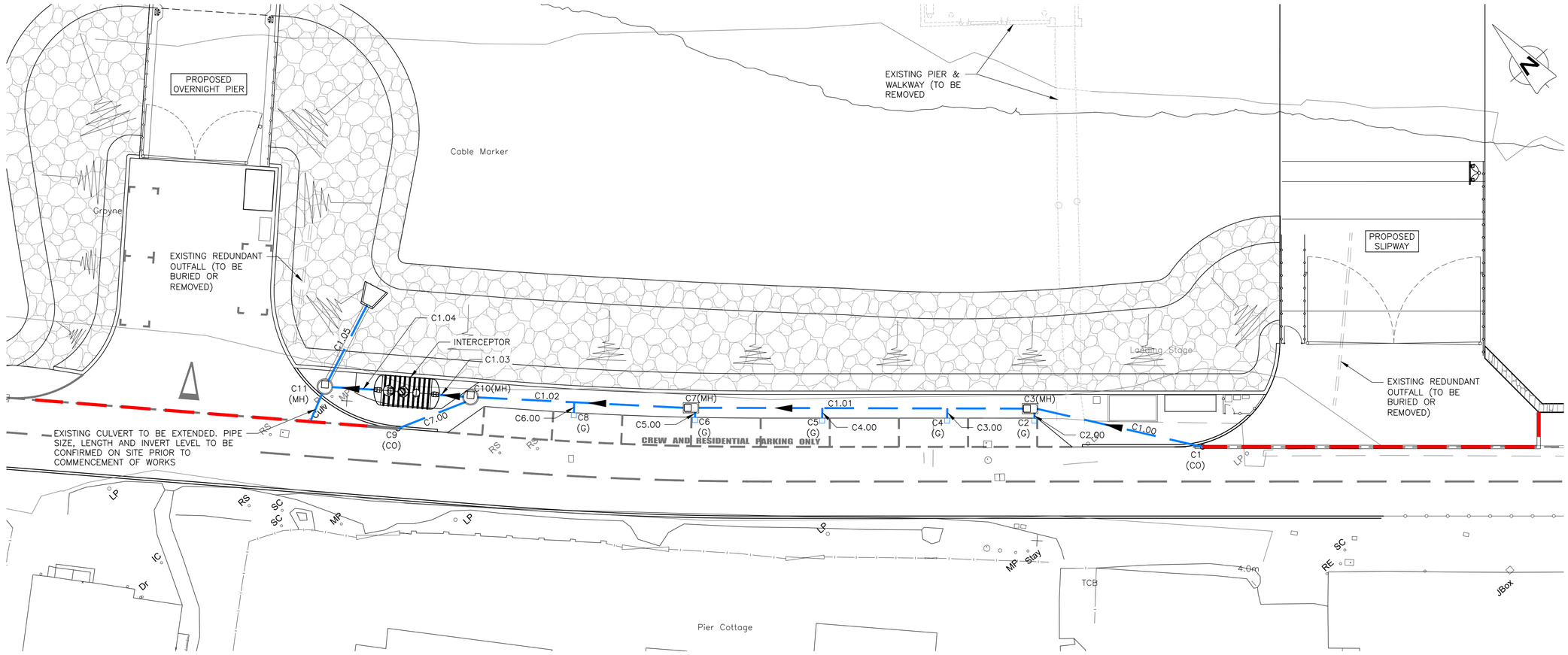
DRAWING TITLE

NETHER LOCHABER
PROPOSED SW DRAINAGE
NETWORK B SCHEDULE

DRAWN	CHECKED	APPROVED
PM	JA	BP
DATE	DATE	DATE
DEC 24	15.01.25	15.01.25
SCALE (A1) 1:250	STAGE PRELIMINARY	REV P01

DRAWING No.
2387–WS–ZZ–NL–DR–C–5304



ARDGOUR – NETWORK C											
CHAMBER DETAILS						INCOMING PIPES			OUTGOING PIPES		
CHAMBER REF	EASTING	NORTHING	CHAMBER TYPE	COVER/FRAME TYPE	COVER LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)
C1	201592.162	763731.679	CHANNEL DRAIN OUTLET	–	5.720	–	–	–	C1.00	150	5.347
C2	201582.792	763743.105	GULLY	D400	5.566	–	–	–	C2.00	150	4.816
C3	201583.229	763744.115	MANHOLE TYPE C	C250	5.706	C1.00	150	4.855	C1.01	225	4.743
						C2.00	150	4.768			
C4	201577.140	763748.153	GULLY	D400	5.644	–	–	–	C3.00	150	4.894
C5	201569.053	763755.377	GULLY	D400	5.744	–	–	–	C4.00	150	4.994
C6	201560.863	763762.772	GULLY	D400	5.797	–	–	–	C5.00	150	5.424
C7	201561.307	763763.789	MANHOLE TYPE C	C250	5.937	C1.01	225	4.461	C1.02	225	4.436
						C5.00	150	5.378			
C8	201553.294	763770.083	GULLY	D400	5.850	–	–	–	C6.00	150	5.100
C9	201541.143	763779.389	CHANNEL DRAIN OUTLET	–	6.000	–	–	–	C7.00	150	5.627
C10	201546.380	763778.463	MANHOLE TYPE B 1200ø	C250	6.178	C1.02	225	4.239	C1.03	300	4.214
						C7.00	150	5.154			
INTERCEPTOR	201543.807	763781.242	SPEL P080 1C/SC	–	6.230	C1.03	300	4.193	C1.04	300	4.093
C11	201538.8380	763786.3260	MANHOLE TYPE B 1200ø	C250	6.280	C1.04	300	4.073	C1.05	300	4.048
OUTFALL	201546.3290	763789.1840				C1.05	300	3.974			

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MHWN	+3.3mCD
MLWN	+1.7mCD
MLWS	+0.7mCD
LAT	0.0mCD

LEGEND:

MH – MANHOLE
G – ROAD GULLY
CO – CHANNEL OUTLET
– CHANNEL DRAIN
– CARRIER PIPE
– FLOW DIRECTION

REV	DATE	DETAILS	DRAWN	CHK'D	APP'D

AMENDMENTS

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Comhairle na Gaidhealtachd

PROJECT
CORRAN FERRY REDEVELOPMENT

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DRAWING TITLE
ARDGOUR TERMINAL SHOREWORKS
PROPOSED DRAINAGE LAYOUT

DRAWN	CHECKED	APPROVED
LS	BP	BP
DATE	DATE	DATE
NOV. 2024	15.01.25	15.01.25
SCALE (A1) 1:250	STAGE PRELIMINARY	REV P01

DRAWING No.
2387–WS–ZZ–AG–DR–C–2301

Appendix C – Surface Water Drainage Design Calculations

Calculation Cover Sheet

Wallace Stone

				No. of Sheets	
Project Title	Corran Ferry Redevelopment		**Project No.** 2387	**File No.**	
Section	NL Marshalling	**Subject**	Drainage	**Calc No.**	C109
Project Manager	Tom Rea	**Design Phase**	A Concept or preliminary ☐ B Analysis and Detailed design X		
Designer	Jamie Arnott		C Design verification ☐ D Other (specify) ☐		

Computer Applications Used

Title	**Version/Date**
ACO QuAD Hydraulic Design	2.0
AutoCAD	2024
Excel	

Scopes of Checking for Manual and Computer-Generated Calculations
Calculation Review

Sheets Checked	**Calculations by**			**Checked By**		
	Name	**Signature**	**Date**	**Name**	**Signature**	**Date**
01 - 43	Jamie Arnott	JAA	21/10/24	ALEX SCOTT	AOK	03/12/2024

a) Basic Design Information or Source and Reference:
HR Wallingford & Barr, Table for the hydraulic design of pipes, sewers, and channels
Marshalls Linear Drainage Design Guide
SPEL Separator Brochure
Marshalls Water Management Drainage Solutions 2023
ACO Threshold Drain Data Sheet
The Highland Council Roads and Transport Guidelines for New Developments 2013
The Highland Council – Flood Risk and Drainage Impact Assessment
SEPA – Climate Change Allowances for Flood Risk Assessment in Land Use Planning v3

b) Identify documents/technical records where output will be used:
Drawings
Contract Documents

Approved by Project Manager	**Signature**	**Date**

Distribution
Original to project file

WALLACE STONE	Project : Corran Ferry	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Nether Lochaber Drainage	Date : 18/10/24	Checked :
	Page No.: 1 of	

Output

Introduction

A drainage system is required to deal with surface water run-off on the Nether Lochaber side of the Corran ferry crossing. The system will capture run-off from a section of the existing road as well as the new junction and construction areas.

The proposed drainage system will be formed by the following:

- × Drainage kerbs
- × Gullies
- × channel drains
- × Filter drains
- × Threshold drains
- × Full retention separator
- × Precast concrete headwall
- × UPVC carrier pipes between the above elements

WALLACE STONE	Project : Corran Ferry	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Nether Lochaber Drainage	Date : 18/10/24	Checked :
	Page No.: 2 of	

Output

Design Parameters

The drainage system will be designed using the following parameters:

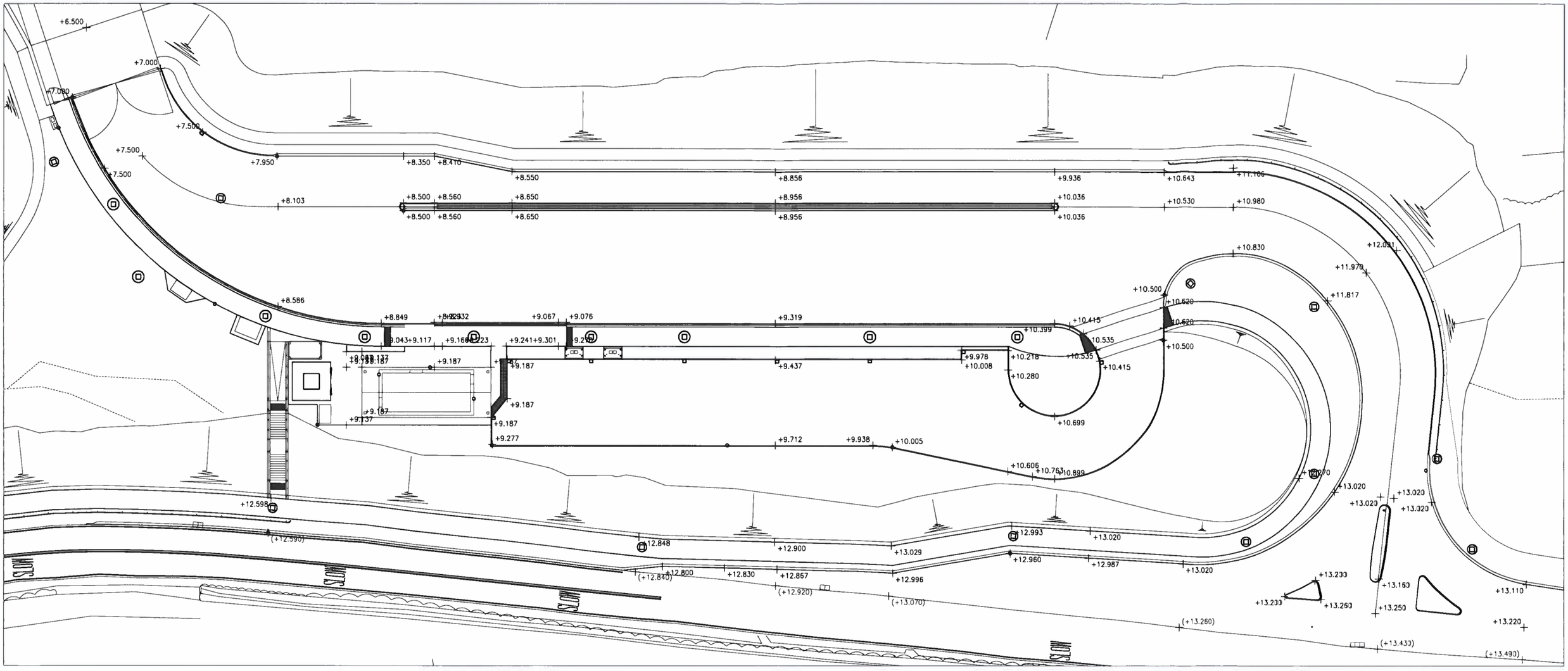
- Return period = 1 in 200 years (see note 1)
- Duration = 5 mins
- Climate change allowance = 46 % (see note 2)

Note 1 : Ref 'The Highland Council - Flood risk and drainage impact assessment' - Page 14, Section 5.6 - 1:200 yr + climate change allowance

Note 2 : Ref 'SEPA - climate change allowances for flood risk assessment in land use planning V3' → Table 2, Argyll

Levels

Site levels have been developed in conjunction with the design of the drainage system. Key levels are shown on the following sketch.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+7.000
+7.000
+7.500
+7.500
+7.500
+7.950
+8.350
+8.410
+8.550
+8.856
+9.936
+10.643
+11.106
+8.103
+8.500
+8.560
+8.650
+8.956
+10.036
+10.530
+10.980
+8.500
+8.560
+8.650
+8.956
+10.036
+8.586
+8.849
+9.067
+9.076
+9.319
+10.399
+10.415
+10.535
+9.043
+9.117
+9.241
+9.301
+9.978
+10.008
+10.218
+10.280
+10.535
+10.415
+10.500
+10.620
+10.620
+10.500
+10.830
+12.091
+11.970
+11.817
+9.187
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+9.187
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+9.712
+9.938
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+10.606
+10.763
+10.899
+10.699
+12.598
+(12.590)
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+12.900
+13.029
12.993
+13.020
+12.960
+12.987
+13.020
+(12.840)
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+12.830
+12.867
+12.996
+(12.920)
+(13.070)
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+13.250
+13.160
+13.250
+13.110
+13.220
+(13.260)
+(13.430)
+(13.490)
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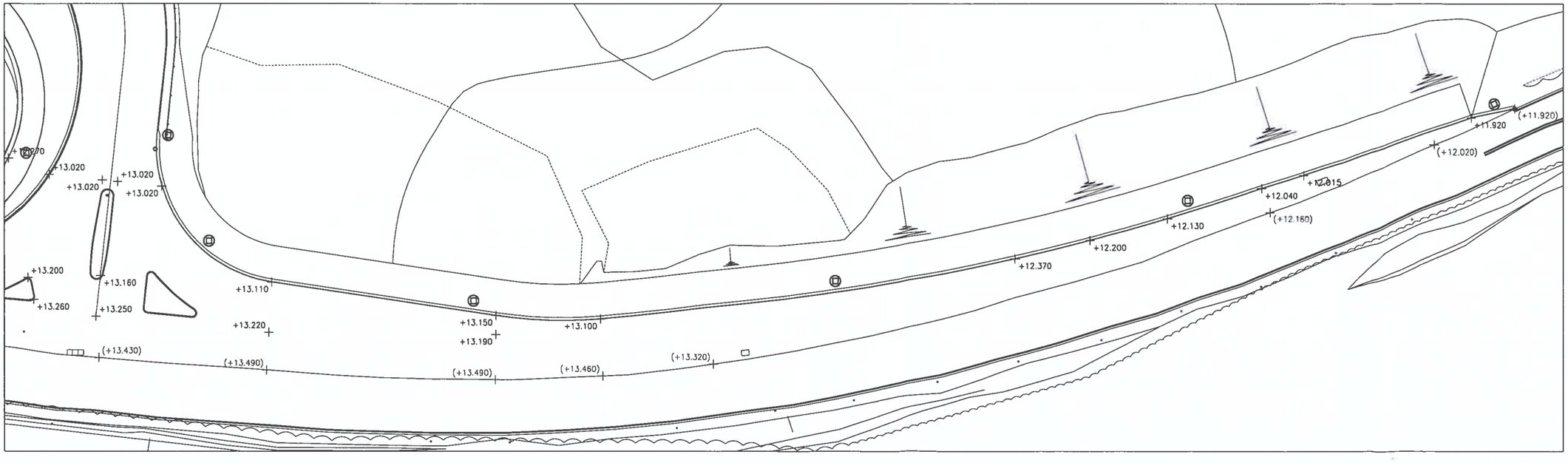
+13.020
+13.020
+13.020
+13.020
+13.020
+13.020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+13.020
+13.020
+13.020
+13.020
+13.200
+13.260
+13.160
+13.250
+13.110
+13.220
+13.150
+13.190
+13.100
(+13.430)
(+13.490)
(+13.490)
(+13.460)
(+13.320)
+12.370
+12.200
+12.130
+12.040
+12.015
(+12.160)
+11.920
(+12.020)
(+11.920)

WALLACE STONE	Project : Corran Ferry	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Nether Lochaber Drainage	Date : 07/10/24	Checked :
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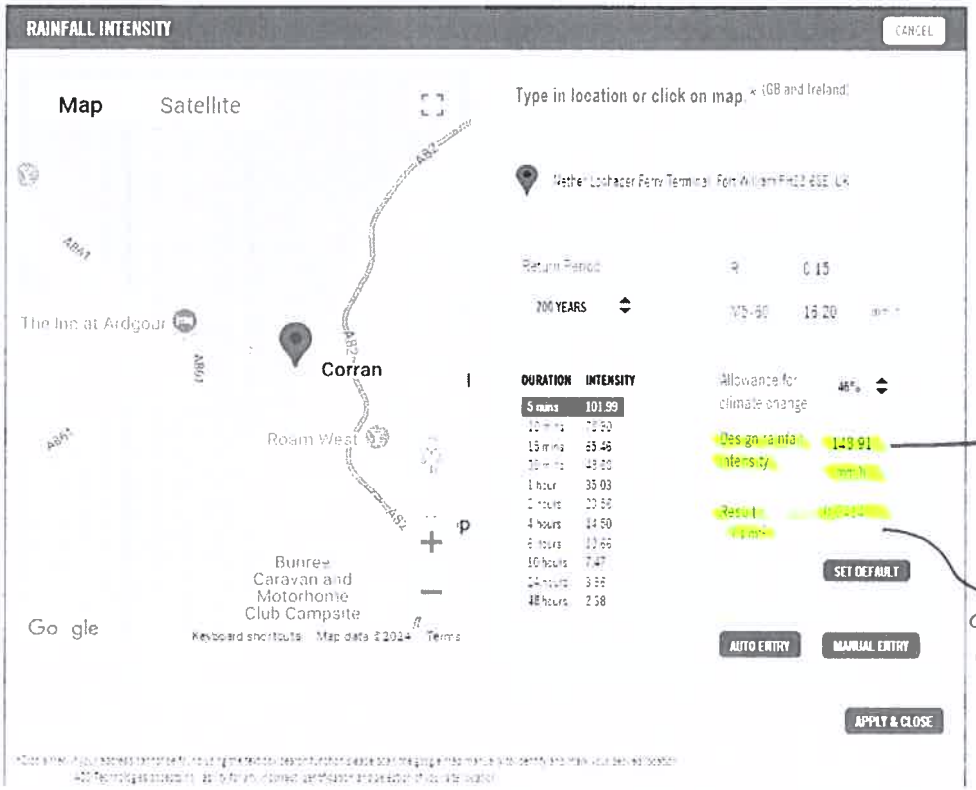
Output

ACO Quad 2.0 - Rainfall Intensity



148.91 mm/h

0.0414 l/s.m^{-2}

Drainage Areas

Drainage areas drawn and measured in Auto CAD. The markups included to show key info.

WALLACE STONE	Project : CORRAN FERRY	
Calculation Sheet	Job No. : 2387	Made By : CS
Description: NETHER LOCHABER DRAINAGE	Date : 29/01/24	Checked :
	Page No.: 5 of	

Output

DESIGN KERB DRAINAGE

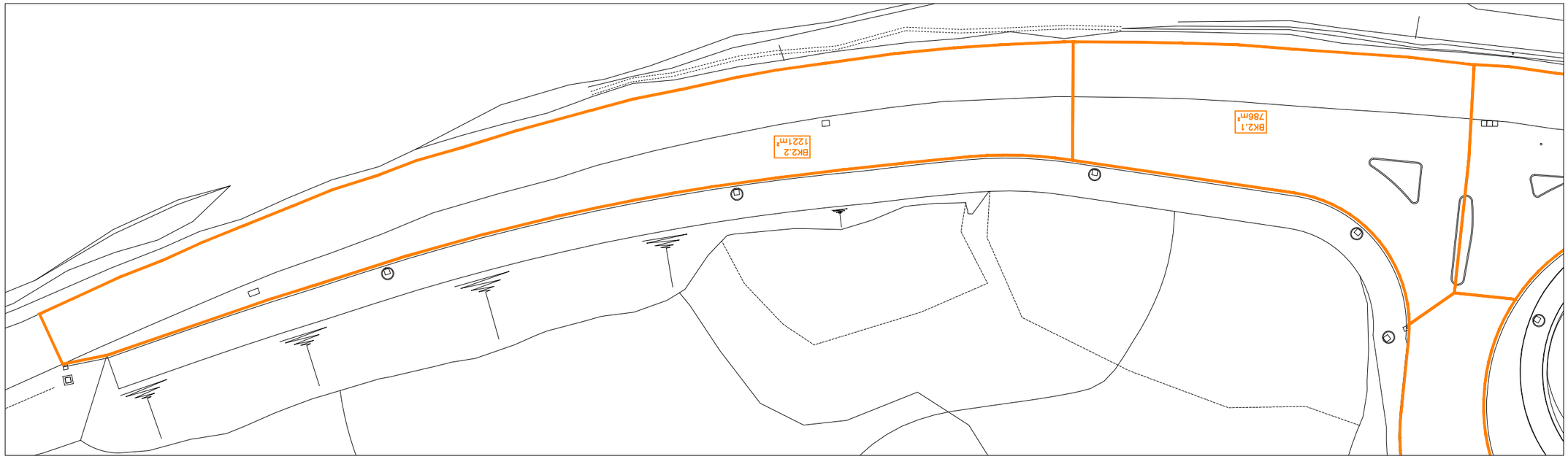
AREAS AND LENGTHS OF KERB DRAINAGE SHOWN ON SKETCH OVERLEAF AND MEASURED AND DRAWN IN CAD.

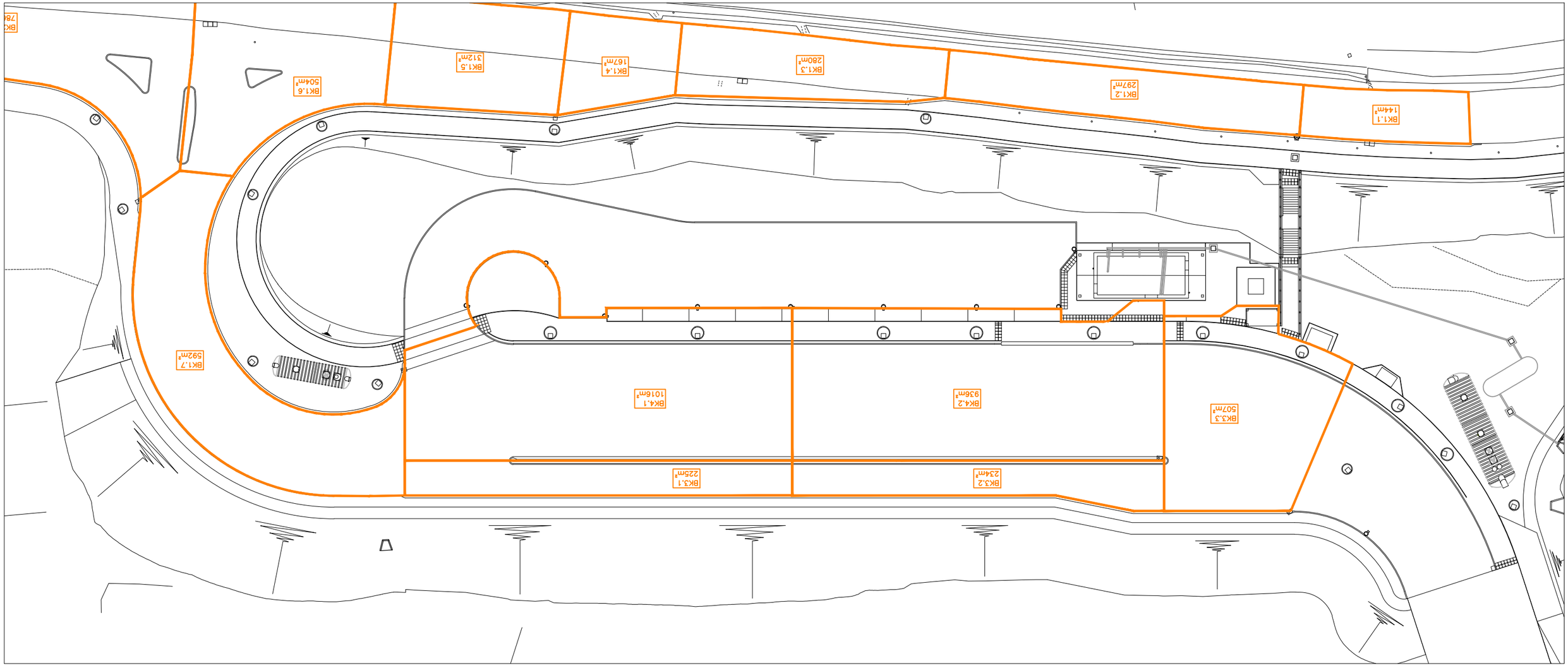
PROPOSE BEANY BLOCK BASE 205 FOR ALL KERB DRAINAGE.

MAX UR= 0.72

TO BE INSTALLED TO MANUFACTURERS GUIDELINES, WITH ACCESS POINTS AT HEAD OF RUNS AS WELL AS EVERY 50m, WITH SILT TRAPS EVERY 100m.

REFER TO MARSHALLS BEANY BLOCK HYDRAULIC DATA (MARSHALLS LINEAR DRAINAGE DESIGN GUIDE [illegible] -PRINTED)


BK2.2
122lm²
BK2.1
786m²


BK1.6
504m²
BK1.5
312m²
BK1.4
167m²
BK1.3
280m²
BK1.2
297m²
BK1.1
144m²
BK1.7
592m²
BK4.1
1016m²
BK4.2
936m²
BK3.3
507m²
BK3.1
225m²
BK3.2
234m²

2387 - Nether Lochaber - Kerb Drain

Rainfall Intensity:	148.91 mm/hr
Result:	0.0414 l/s m^{-2}

AREA REF	DRAINAGE AREA (m^2)	MAX FLOW (l/s)	APPROX PIPE LENGTH (m)	PIPE LENGTH (m)	APPROX PIPE GRADIENT	PIPE GRADIENT	PROPOSED KERB DRAIN	DISCHARGE CAPACITY (l/s)	UTILISATION
BK1.1	144	5.96	22.0	50	1 IN 44	1 IN 50	BEANY BLOCK BASE 205	79	0.08
BK1.2	297	12.29	46.0	50	1 IN 184	1 IN 200	BEANY BLOCK BASE 205	55	0.22
BK1.3	280	11.58	34.5	50	1 IN 221	1 IN 300	BEANY BLOCK BASE 205	48	0.24
BK1.4	167	6.91	15.5	50	1 IN 431	1 IN 500	BEANY BLOCK BASE 205	42	0.16
BK1.5	312	12.91	22.5	50	1 IN 375	1 IN 400	BEANY BLOCK BASE 205	45	0.29
BK1.6	504	20.85	23.0	50	Zero	Zero	BEANY BLOCK BASE 205	31	0.67
BK1.7	592	24.49	53.5	50	1 IN 22	1 IN 50	BEANY BLOCK BASE 205	79	0.31
BK2.1	786	32.51	46.0	50	1 IN 354	1 IN 400	BEANY BLOCK BASE 205	45	0.72
BK2.2	1,221	50.51	116.0	100	1 IN 94	1 IN 100	BEANY BLOCK BASE 205	71	0.71
BK3.1	225	9.31	50.0	50	1 IN 28	1 IN 50	BEANY BLOCK BASE 205	79	0.12
BK3.2	234	9.68	48.0	50	1 IN 105	1 IN 200	BEANY BLOCK BASE 205	55	0.18
BK3.3	507	20.97	16.5	50	1 IN 39	1 IN 50	BEANY BLOCK BASE 205	79	0.27
BK4.1	1,016	42.03	36.0	50	1 IN 23	1 IN 50	BEANY BLOCK BASE 205	79	0.53
BK4.2	936	38.72	48.0	50	1 IN 105	1 IN 200	BEANY BLOCK BASE 205	55	0.70
			↑ *Pipe length within catchment area*	↑ *Pipe length used for comparison with design guide. Note: rounded down for lengths > 50m (conservative)*		↑ *Pipe gradient used for comparison with design guide. Note: rounded down, e.g. flatter gradient (conservative)*	↑ *REF. MARSHALLS LINEAR DRAINAGE DESIGN GUIDE P.30 (PRINTOFF INCLUDED)*		

Hydraulic Data

The Beany Block hydraulic data stated in the following tables comprises of flow capacity, in litres per second (l/s) and velocity in metres per second (m/s). This data has been calculated using spatially variable flow design principles.

Symmetrical HB & Straight Backed Top Block

Base 205

Gradient	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
Length (m)	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s
50	31	0.48	37	0.58	42	0.66	45	0.70	48	0.75	55	0.86	64	1.00	79	1.23
100	27	0.42	36	0.56	43	0.67	47	0.73	52	0.81	62	0.97	71	1.11	86	1.34
150	24	0.38	35	0.55	44	0.69	48	0.75	55	0.86	69	1.08	78	1.22	93	1.45
200	20	0.31	33	0.52	44	0.69	50	0.78	59	0.92	76	1.19	85	1.33	99	1.55
250	17	0.27	32	0.50	45	0.70	52	0.81	62	0.97	83	1.30	92	1.44	106	1.66

Base 295

Gradient	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
Length (m)	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s
50	47	0.53	56	0.64	63	0.72	66	0.75	71	0.81	80	0.91	93	1.06	115	1.31
100	43	0.49	55	0.63	64	0.73	68	0.77	75	0.85	89	1.01	102	1.16	123	1.40
150	37	0.42	53	0.60	65	0.74	70	0.80	79	0.90	96	1.09	110	1.25	131	1.49
200	35	0.40	51	0.58	65	0.74	72	0.82	83	0.94	105	1.19	118	1.34	140	1.59
250	30	0.34	50	0.57	66	0.75	74	0.84	87	0.99	113	1.28	127	1.44	148	1.68
300	26	0.30	48	0.55	67	0.76	76	0.86	91	1.03	122	1.39	135	1.53	156	1.77
350	22	0.25	46	0.52	68	0.77	78	0.89	95	1.08	130	1.48	143	1.63	164	1.86

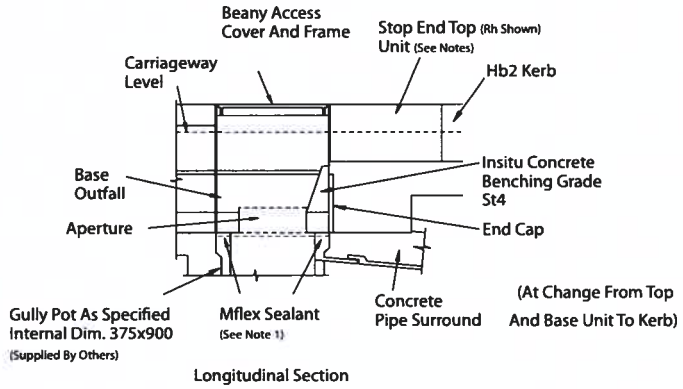
Base 365

Gradient	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
Length (m)	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s
50	61	0.58	73	0.70	81	0.77	85	0.81	91	0.87	102	0.97	119	1.13	147	1.40
100	57	0.54	71	0.68	82	0.78	87	0.83	95	0.90	111	1.06	128	1.22	155	1.48
150	53	0.50	69	0.66	83	0.79	89	0.85	99	0.94	120	1.14	137	1.30	164	1.56
200	48	0.46	68	0.65	84	0.80	91	0.87	104	0.99	128	1.22	145	1.38	173	1.65
250	44	0.42	66	0.63	85	0.81	94	0.90	108	1.03	137	1.30	154	1.47	182	1.73
300	39	0.37	64	0.61	85	0.81	96	0.91	112	1.07	146	1.39	163	1.55	191	1.82
350	35	0.33	62	0.59	86	0.82	98	0.93	117	1.11	155	1.48	172	1.64	200	1.90
400	31	0.30	61	0.58	87	0.83	100	0.95	121	1.15	164	1.56	181	1.72	208	1.98

Base 630

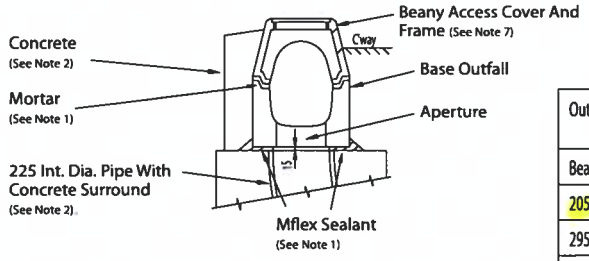
Gradient	Zero		1 in 1000		1 in 500		1 in 400		1 in 300		1 in 200		1 in 100		1 in 50	
Length (m)	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s
100	136	0.66	164	0.79	183	0.88	192	0.93	206	1.00	233	1.13	271	1.31	334	1.61
150	131	0.63	161	0.78	184	0.89	195	0.94	212	1.02	245	1.18	283	1.37	345	1.67
200	125	0.60	159	0.77	186	0.90	198	0.96	217	1.05	256	1.24	295	1.43	357	1.72
250	119	0.57	157	0.76	187	0.90	201	0.97	223	1.08	268	1.29	307	1.48	369	1.78
300	113	0.55	154	0.74	188	0.91	204	0.99	229	1.11	280	1.35	319	1.54	381	1.84
350	107	0.52	152	0.73	189	0.91	207	1.00	235	1.14	292	1.41	331	1.60	393	1.90
400	101	0.49	150	0.72	190	0.92	210	1.01	241	1.16	303	1.46	342	1.65	404	1.95
450	96	0.46	147	0.71	191	0.92	213	1.03	246	1.19	316	1.53	354	1.71	416	2.00
500	90	0.43	145	0.70	193	0.93	216	1.04	252	1.22	327	1.58	366	1.77	428	2.07
550	84	0.41	143	0.69	194	0.94	219	1.06	258	1.25	339	1.64	377	1.82	440	2.13
600	78	0.38	140	0.68	195	0.94	222	1.07	264	1.28	351	1.70	390	1.88	451	2.18

Standard Details



Longitudinal Section

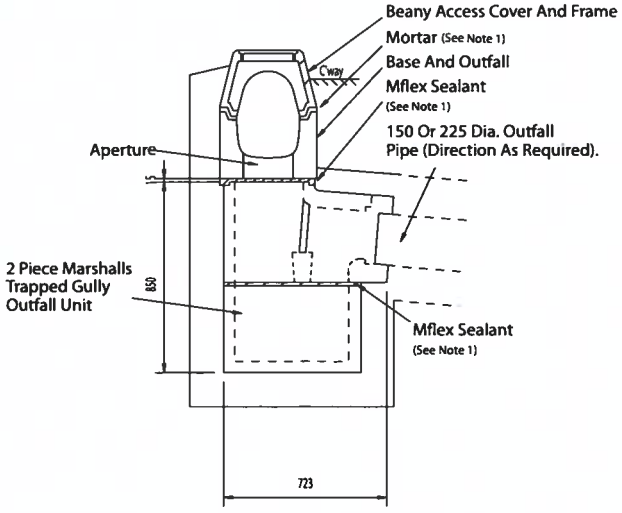
Outfall Using Gully Pot & Stop End Detail



Cross Section

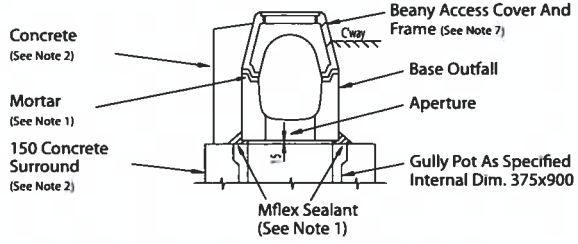
Outfall Direct To 225 Dia. Pipe

Outfall Pipe Invert Depth From Carriageway Level(Mm)		
Beany Base	150ø	225ø
205	701	738
295	791	828
365	861	898
All Figures Assume 125mm Kerb Upstand		

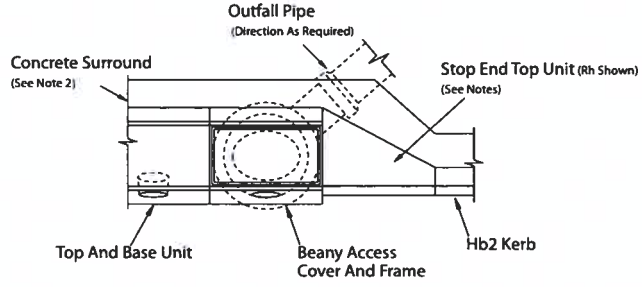


Cross Section

Outfall Using Marshalls Gully Outfall



Cross Section



Plan

WALLACE STONE	Project : Corran Ferry	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Nether Lochaber Drainage	Date : 18/10/24	Checked :
	Page No.: 10 of	

Output

Filter Drain Design

Locate filter drain along base of the slope.

approx. length = 180 m

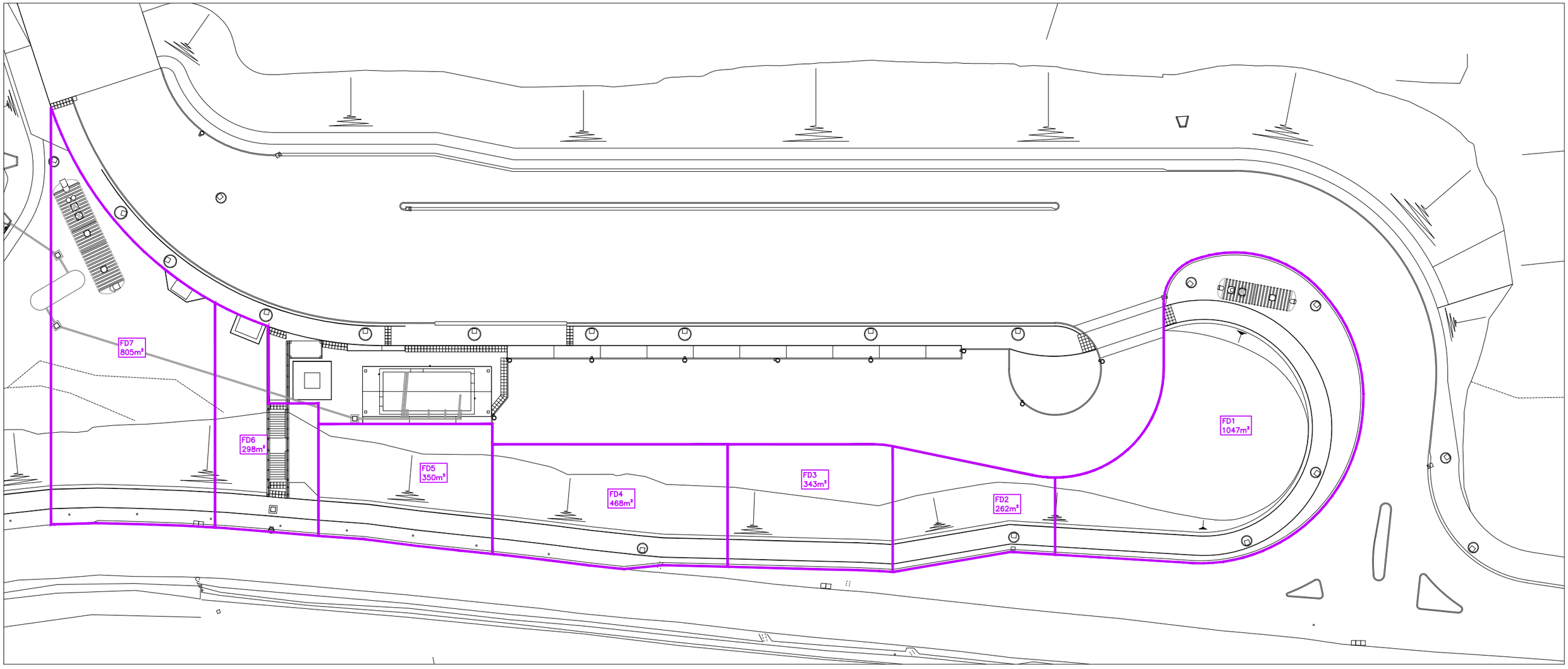
Propose 7 no. outfalls at various points along filter drain

Calculate max flow at each outfall location using the drainage area x rainfall intensity.

Use HR Wallingford tables to select suitable outfall pipe diameter (Ks = 0.06 for plastic pipes)

Say pipe invert level = 600mm from ground surface.

Propose 225mm Ø perforated plastic pipe for full length of filter drain with 225mm Ø outfalls


FD7
805m²
FD6
298m²
FD5
350m²
FD4
468m²
FD3
343m²
FD2
262m²
FD1
1047m²

2387 - Nether Lochaber - Filter Drain

Rainfall Intensity:	148.91 mm/hr
Result:	0.0414 l/s m^{-2}

RUN REF	DRAINAGE AREA (m^2)	MAX FLOW (l/s)	APPROX PIPE LENGTH (m)	APPROX GROUND PROFILE GRADIENT	PROPOSED PIPE GRADIENT	PROPOSED FILTER DRAIN DIAMETER (mm)	DISCHARGE CAPACITY (l/s)	UTILISATION
FD1	1,047	43.31	27.5	1 IN 69	1 IN 100	225	64.781	0.67
FD2	262	10.84	21.5	1 IN 24	1 IN 100	225	64.781	0.17
FD3	343	14.19	21.5	1 IN 59	1 IN 100	225	64.781	0.22
FD4	468	19.36	30.5	1 IN 84	1 IN 100	225	64.781	0.30
FD5	350	14.48	25.0	1 IN 106	1 IN 100	225	64.781	0.22
FD6	298	12.33	22.0	1 IN 49	1 IN 100	225	64.781	0.19
FD7	805	33.30	34.0	1 IN 21	1 IN 100	225	64.781	0.51

REF. HR WALLINGFORD - TABLES FOR THE HYDRAULIC DESIGN OF PIPES AND SEWERS 7TH ED. Ks = 0.060 FOR PLASTIC PIPES.

WALLACE STONE	Project : CORRAN FERRY	
Calculation Sheet	Job No. : 2387	Made By : CS
Description: NETHER LOCHABER DRAINAGE	Date : 30/01/24	Checked :
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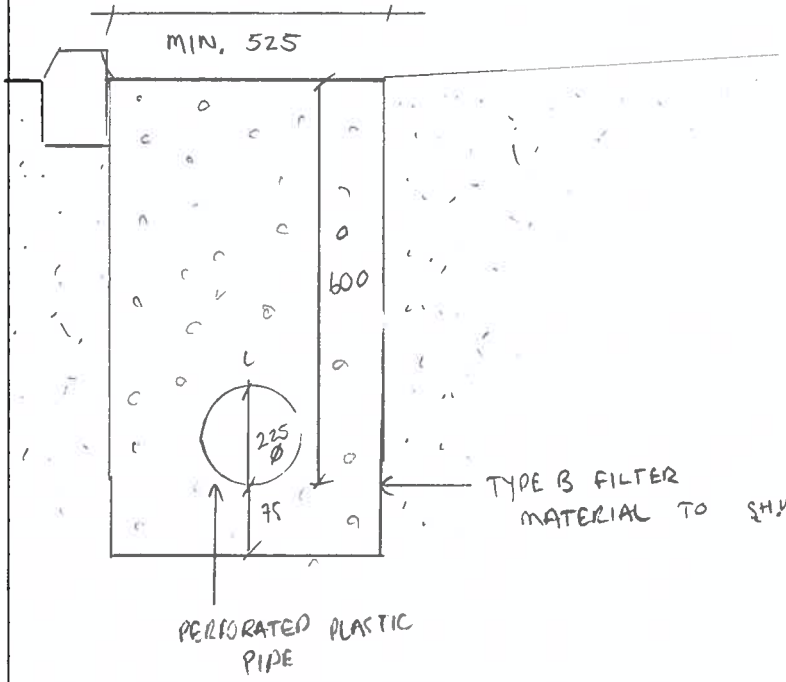
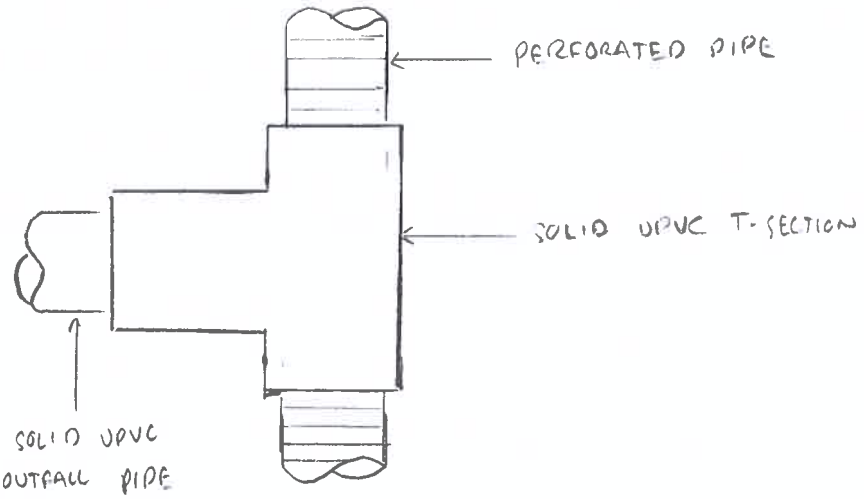
Output

FILTER DRAIN DETAILS

FILTER DRAIN SECTION



FILTER DRAIN OUTFALL PLAN



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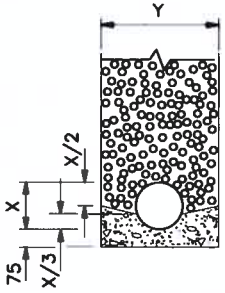
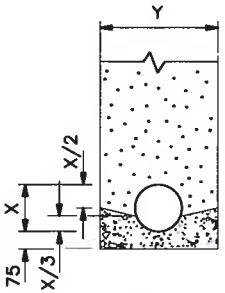
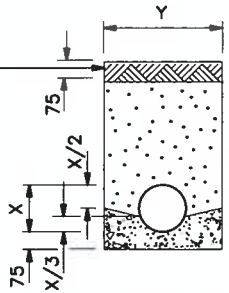


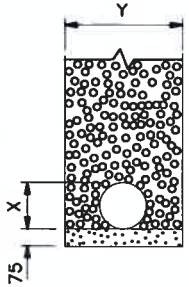
TYPE G



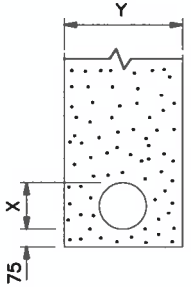
TYPE J



TYPE L



TYPE H



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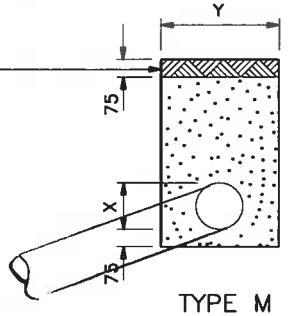
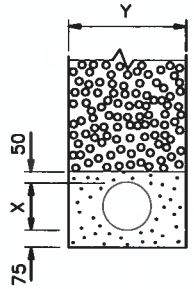


TYPE M



TYPE I

Turf or seed on topsoil as described in Appendix 5/1

600

I.L. of FILTER DRAIN AND OUTFALL

KEY

Type A or C filter material to S.H.W. Clause 505 or granular material to S.H.W. Clause 503.3(i).

Type B filter material to S.H.W. Clause 505.

ST2 concrete to S.H.W. Clause 2602.

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. Dimension X is the external diameter of the pipe.
3. This drawing is to be read in conjunction with Appendix 5/1
4. For details of section of the drain at surface level refer to the 'B' series of drawings.
5. Pipes shall comply with the requirements for filter drain pipes in Table 5/1 of the S.H.W.
6. Pipes are to be laid with slots or perforations upwards where a concrete bed is used. For other beds the slots shall be orientated as described in Appendix 5/1.
7. Minimum drain width
   Y = X+300 for drains not exceeding 1.5m cover below finished level.
   Y = X+450 for drains exceeding 1.5m cover below finished level.

HIGHWAY CONSTRUCTION DETAILS	DRAINAGE	C	NOV 03	FILTER DRAINS – TRENCH AND BEDDING DETAILS	Drawing No.
		B	MAR 98		F2
		A	DEC 91		
		Issue	Date		

WALLACE STONE	Project : Corran Ferry	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Nether Lochaber Drainage	Date : 18/10/24	Checked :
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Output

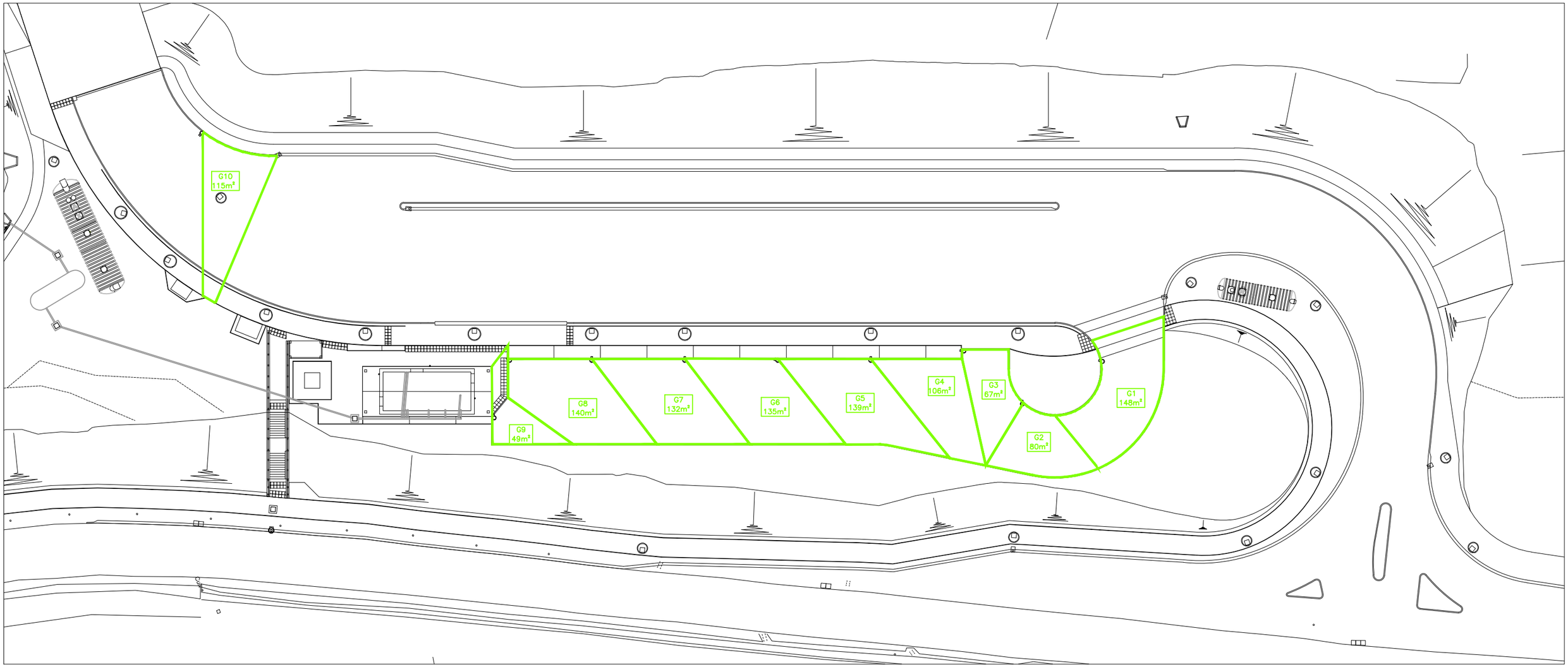
Gully Design

Propose gullies in car park area and an area at the top of the slipway which isn't drained by the channel drain.

Gullies located to drain no more than 200m² as per guidance from The Highland Council.

Propose 9no gullies in car parking area and 1no. in marshalling area.

Propose Marshalls precast gully pots, with in-situ brickwork riser to each carriageway level.


G10
115m²
G9
49m²
G8
140m²
G7
132m²
G6
135m²
G5
139m²
G4
106m²
G3
67m²
G2
80m²
G1
148m²

2387 - Nether Lochaber - Gullies

Rainfall Intensity:	148.91 mm/hr
Result:	**0.0414 l/s m^{-2}**

AREA REF	AREA (m^2)	MAX FLOW (l/s)
G1	148	**6.12**
G2	80	**3.31**
G3	67	**2.77**
G4	106	**4.38**
G5	138	**5.71**
G6	135	**5.58**
G7	132	**5.46**
G8	140	**5.79**
G9	49	**2.03**
G10	115	**4.76**

MAX AREA = 200m²
REF. THE HIGHLAND COUNCIL ROADS AND TRANSPORT GUIDELINES FOR NEW DEVELOPMENTS 5.25.3.4

WALLACE STONE	Project : Corran Ferry	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Nether Lochaber Drainage	Date : 18/10/24	Checked :
	Page No.: 18 of	

Output

Channel Drain

Propose installation of a channel drain at top of slipway. Channel drain will be installed level.

Propose Birco 200 1510

UR = 0.77

Threshold Drain

Propose installation of threshold drains at the 3 door locations of the toilet facilities.

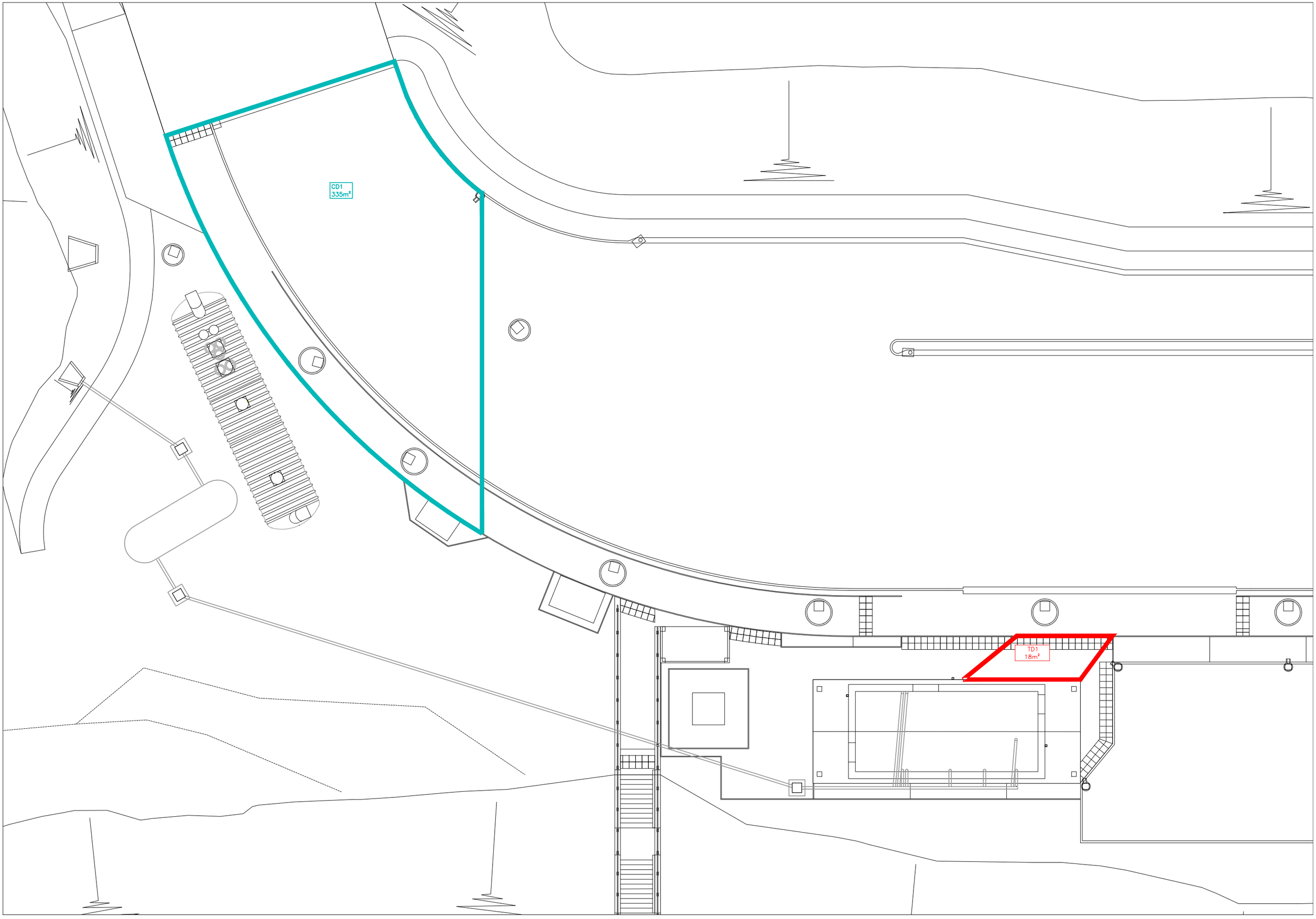
↳ ACO Threshold drain system

Max Threshold drainage area = $18m^2$

↑ at front entrance

=> 18 x 0.041 = 0.75 l/s

↑ flow at worst threshold drain is negligible, Take flow from drains as 1 l/s for purpose of design.


CD1
335m²
TD1
18m²

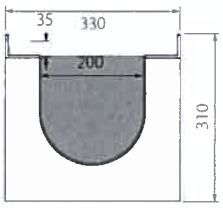
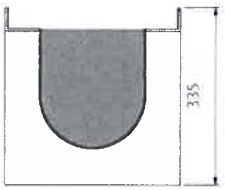
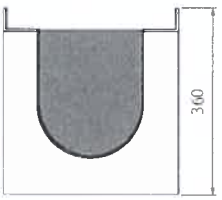
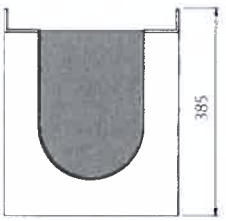
2387 - Nether Lochaber - Channel Drains

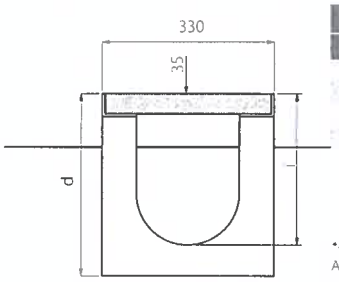
Rainfall Intensity:	148.91 mm/hr
Result:	0.0414 l/s m^{-2}

RUN REF	DRAINAGE AREA (m²)	MAX FLOW (l/s)	PROPOSED CHANNEL LENGTH (m)	PROPOSED CHANNEL GRADIENT	PROPOSED CHANNEL DRAIN	DISCHARGE CAPACITY (l/s)	UTILISATION
CD1	335	13.86	12	FLAT	BIRCO 200 15/0	18	0.77
					REF. MARSHALLS LINEAR DRAINAGE DESIGN GUIDE P.155 (PRINTOFF INCLUDED)		

Hydraulic Data

FLOW CAPACITY

Birco 200 with 0/0 Channel Unit	Birco 200 with 5/0 Channel Unit	Birco 200 with 10/0 Channel Unit	Birco 200 with 15/0 Channel Unit
 (0/0)	 (5/0)*	 (10/0)	 (15/0)*
Equivalent Pipe Diameter (mm) 230	Equivalent Pipe Diameter (mm) 245	Equivalent Pipe Diameter (mm) 260	Equivalent Pipe Diameter (mm) 270



BIRCO 200		
ref.	d	l
0/0	310	240
5/0	335	265
10/0	360	290
15/0	385	315

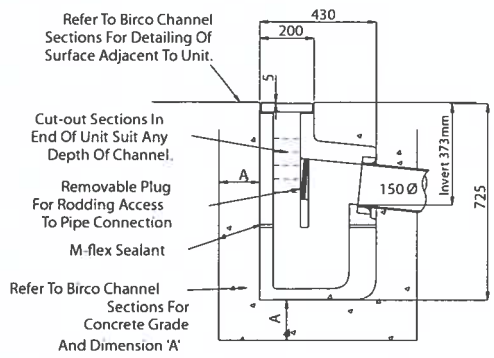
*-dimensions at downstream end, deduct 10mm for upstream end
All dimensions measured from grating surface, pavement should be 5mm above this level

The Birco hydraulic data stated in the following tables comprises of flow capacity, in litres per second (l/s) and velocity in metres per second (m/s). This data has been calculated using the Colebrook-White formulae.

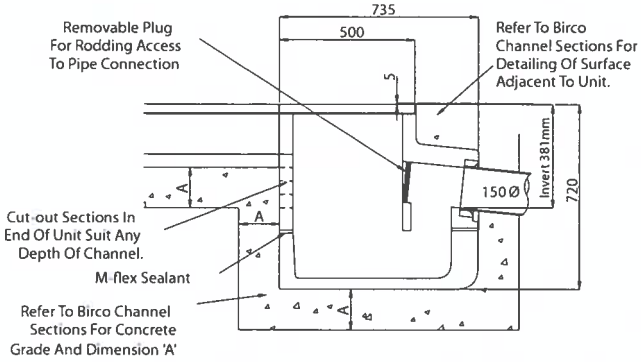
Birco 200								
Channel Type	0/0		5/0		10/0		15/0	
Gradient "1 in"	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s
10	176	4.78	204	4.90	233	4.99	262	5.07
20	124	3.38	144	3.46	165	3.52	185	3.58
30	101	2.76	118	2.82	134	2.87	151	2.92
40	88	2.38	102	2.44	116	2.49	131	2.53
50	78	2.13	91	2.18	104	2.22	117	2.26
75	64	1.74	74	1.78	85	1.81	95	1.84
100	55	1.50	64	1.54	73	1.57	82	1.59
150	45	1.22	52	1.25	60	1.28	67	1.30
200	39	1.06	45	1.08	52	1.10	58	1.12
300	32	0.86	37	0.88	42	0.90	47	0.91
400	27	0.74	32	0.76	36	0.78	41	0.79
500	24	0.66	28	0.68	32	0.69	36	0.70
750	20	0.54	23	0.55	26	0.56	30	0.57
1000	17	0.47	20	0.48	23	0.49	26	0.49
1500	14	0.38	16	0.39	18	0.40	21	0.40
2000	12	0.33	14	0.33	16	0.34	18	0.35

Selected model flow data

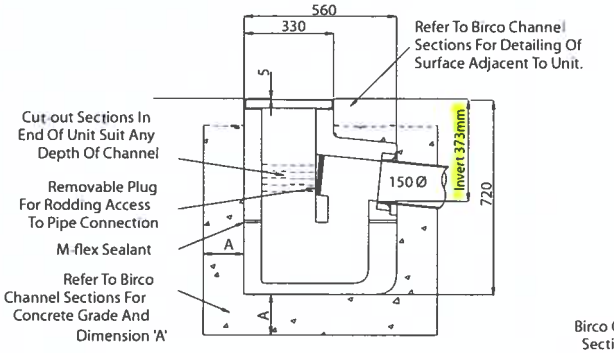
Drawing 2 of 2



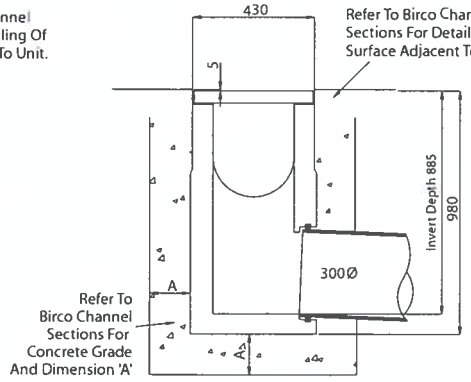
Birco 100 - Inline Side Outfall
(Unit Is 500mm Long)



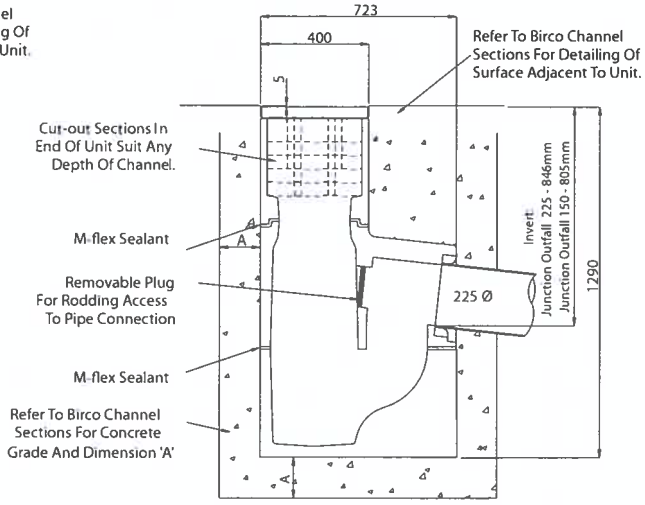
Birco 150 - Inline End Outfall
(Unit Is 250mm Wide)



Birco 200 - Inline Side Outfall
(Unit Is 500mm Long)



Birco 300$_{AS}$ Outfall
(Unit Is 500mm Long)

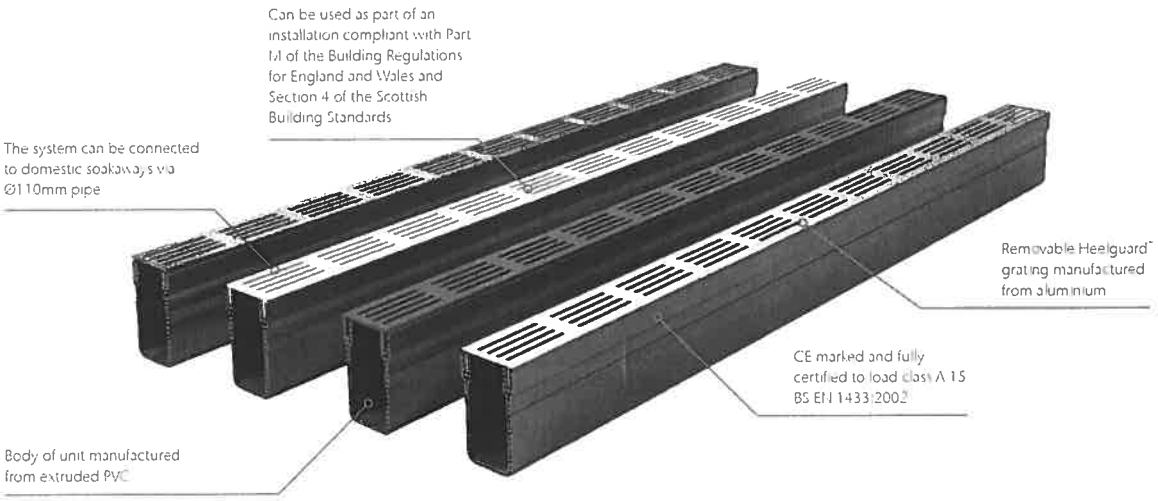


Birco Junction Outfall 150/225
(Unit Is 400mm Long)

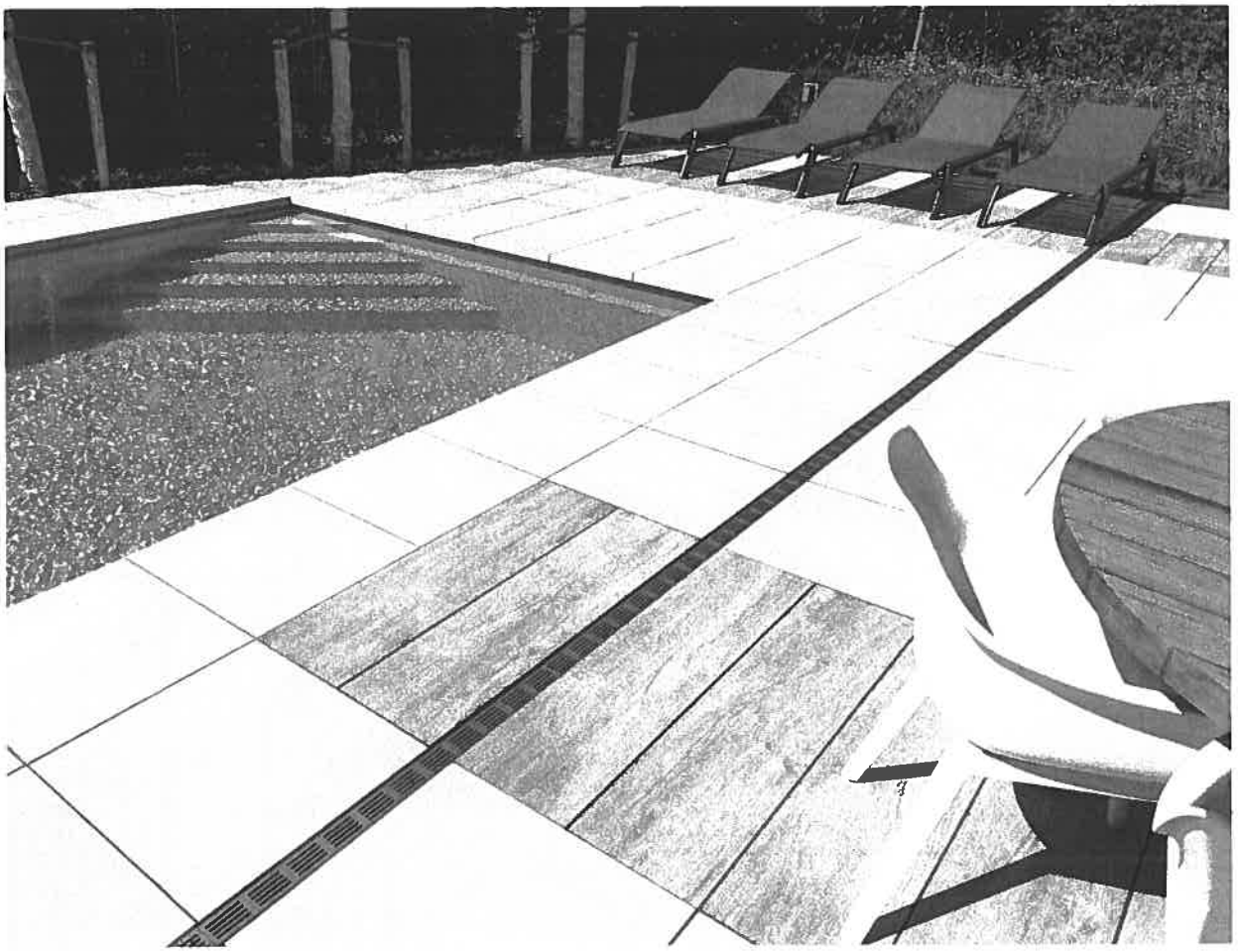
Birco 100, 150, 200 & 300$_{AS}$ Outfall Details

Note: All Invert & Overall Depths Are Measured From Carriageway Surface

ACO Threshold Drain System Overview



Product Code	Description	Length [mm]	Width Overall [mm]	Depth Overall [mm]	Invert [mm]	Weight [kg]
ACO Threshold Drain						
19000	ACO Threshold Drain - silver aluminium grating	1000	61	100	93	1.63
19005	ACO Threshold Drain - black aluminium grating	1000	61	100	93	1.63
19012	ACO Threshold Drain - CorTen steel grating*	1000	61	100	93	1.63
19058	NEW! ACO Threshold Drain - stainless steel grating	1000	61	100	93	1.63



WALLACE STONE	Project : Corran Ferry	
Calculation Sheet	Job No. : 2387	Made By : SA
Description: Nether Lochaber Drainage	Date : 21/10/24	Checked :
	Page No.: 24 of	

Output

Carrier Pipe Design

Propose carrier pipe network across the site.

See overleaf for layout - cover and invert levels are presented on the carrier pipe and drainage schedules.

Pipework selection

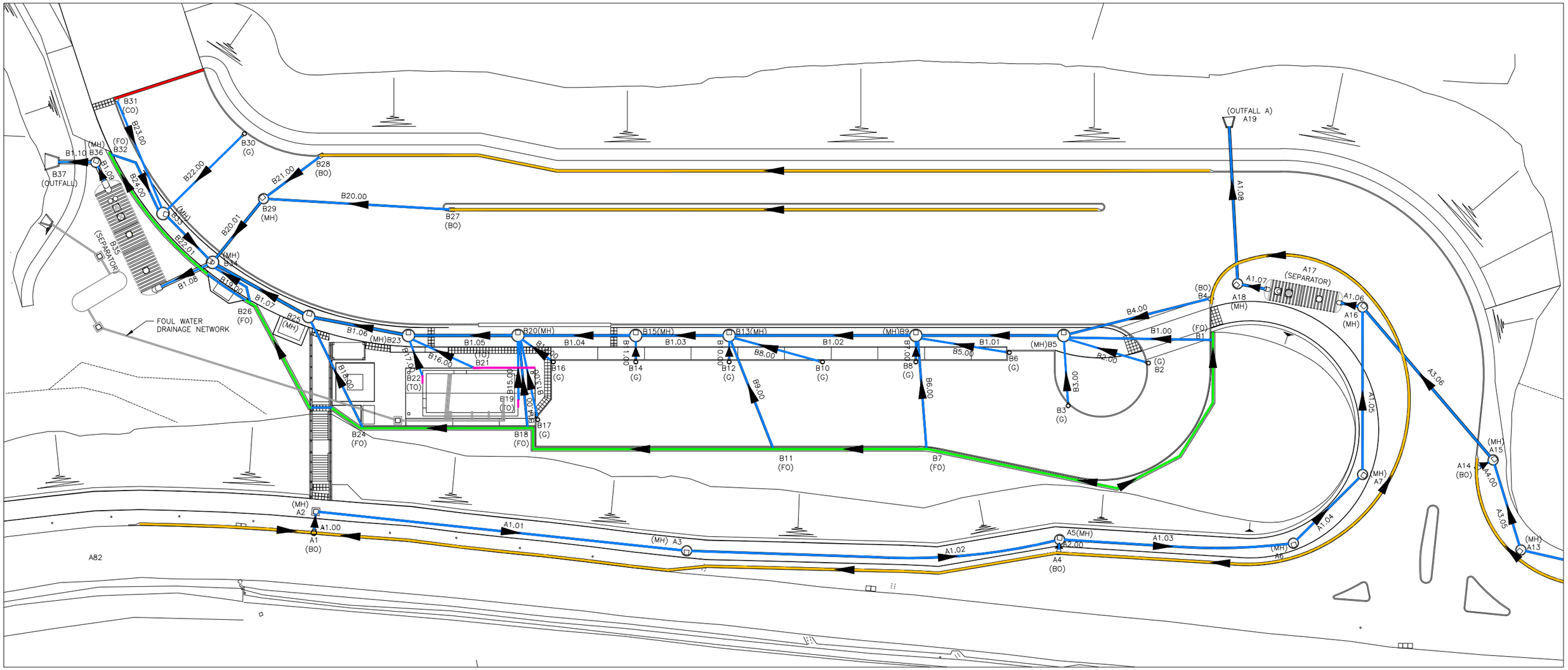
The pipework has been sized based on the flow requirement and proposed gradient.

Refer to 'Table for hydraulic design of pipes, sewers and channels, 7th Ed, HR Wallingford'

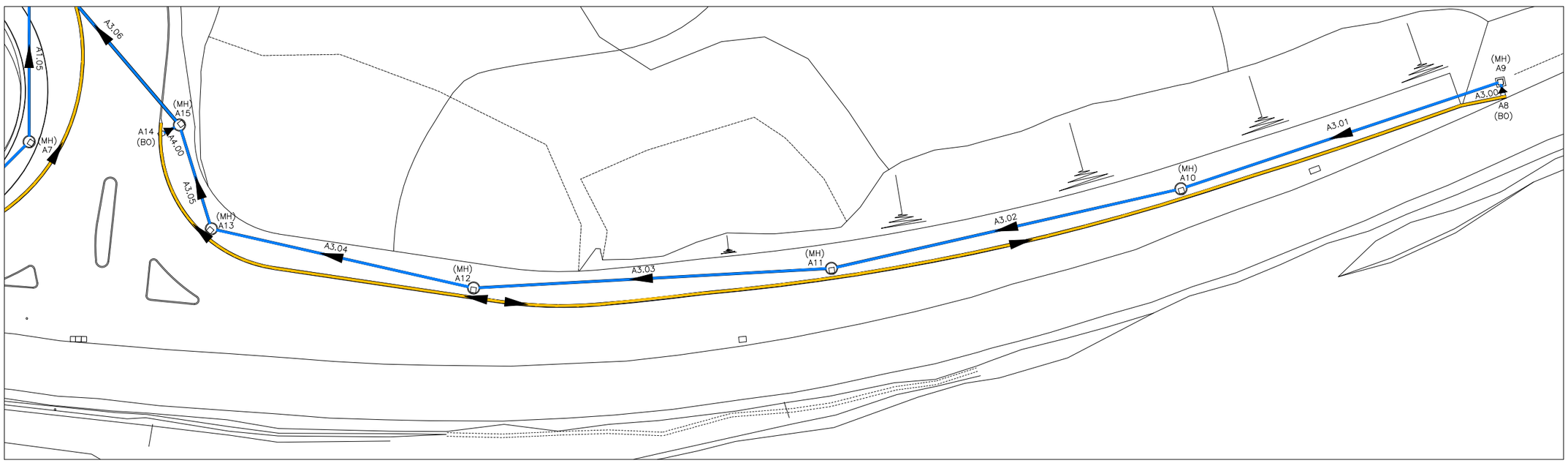
Assume UPVC standard pipework, with spigot and socket joints, 'O' ring seals at 6-9m intervals

Pipe ks = 0.06 under normal conditions.

Minimum fall limited to 1 in 100.



(OUTFALL A)
A19
A17
(SEPARATOR)
A18
(MH)
A16
(MH)
A1.07
A1.06
A1.08
A3.06
A1.05
A14
(BO)
A4.00
A3.05
(MH)
A13
(MH)
A7
A1.04
A1.03
A5(MH)
A2.00
A4
(BO)
(MH)
A6
A1.02
A1.01
(MH) A3
A1.00
A1
(BO)
(MH)
A2
A82
B37
(OUTFALL)
B35
(SEPARATOR)
FOUL WATER
DRAINAGE NETWORK
B31
(CO)
B23.00
B30
(G)
B28
(BO)
B22.00
B21.00
B20.00
B29
(MH)
B27
(BO)
B20.01
B22.01
B1.08
B26
(FO)
B25
(MH)
B1.07
B1.06
B1.05
B1.04
B1.03
B1.02
B1.01
B1.00
B4.00
B2.00
B3.00
B3
(G)
B6
(G)
B5.00
B8
(G)
B9.00
B10
(G)
B8.00
B12
(G)
B14
(G)
B16
(G)
B17
(G)
B18
(FO)
B19
(TO)
B22
(TO)
B24
(FO)
B11
(FO)
B7
(FO)
B16.00
B17.00
B15.00
B14.00
B13.00
B1.10
B36
B1.09
B24.00
B23
B20(MH)
B15(MH)
B13(MH)
(MH)B9
(MH)B5
(BO)
B4
(FO)
B1
(G)
B2



A1.05
A3.06
(MH)
A7
(MH)
A15
A14
(BO)
A4.00
A3.05
(MH)
A13
A3.04
(MH)
A12
A3.03
(MH)
A11
A3.02
(MH)
A10
A3.01
(MH)
A9
A3.00
A8
(BO)

2387 - Nether Lochaber - Carrier Pipes

			Ref. drainage schedule ↓	*Ref. drainage schedule* ↓						
PIPE NETWORK A:										
RUN REF	**CONTRIBUTIONS TO FLOW**	**TOTAL FLOW (l/s)**	**INVERT LEVEL AT START OF RUN (mCD)**	**INVERT LEVEL AT END OF RUN (mCD)**	**PIPE LENGTH (m)**	**START & END INVERT HEIGHT DIFFERENCE (m)**	**PIPE GRADIENT**	**REQUIRED PIPE DIAMETER**	**DISCHARGE CAPACITY (l/s)**	**UTILISATION**
PIPE NETWORK A:										
A1.00	BK1.1 + BK1.2 + BK1.3	**29.82**	**11.852**	**11.765**	1.749	**0.087**	**1 IN 20**	225	149.580	0.20
A1.01	A1.00	**29.82**	**11.740**	**11.269**	47.028	**0.470**	**1 IN 100**	225	64.781	0.46
A1.02	A1.01	**29.82**	**11.244**	**10.775**	46.933	**0.469**	**1 IN 100**	225	64.781	0.46
A2.00	BK1.4 + BK1.5	**19.81**	**12.222**	**12.157**	0.648	**0.065**	**1 IN 10**	225	213.460	0.09
A1.03	A1.02 + A2.00	**49.64**	**10.750**	**10.461**	28.906	**0.289**	**1 IN 100**	225	64.781	0.77
A1.04	A1.03	**49.64**	**10.436**	**10.323**	11.334	**0.113**	**1 IN 100**	225	64.781	0.77
A1.05	A1.04	**49.64**	**10.298**	**10.095**	20.300	**0.203**	**1 IN 100**	225	64.781	0.77
A3.00	BK2.2	**50.51**	**11.182**	**11.151**	0.613	**0.031**	**1 IN 20**	225	149.580	0.34
A3.01	A3.00	**50.51**	**11.126**	**10.722**	36.426	**0.405**	**1 IN 90**	225	68.106	0.74
A3.02	A3.01	**50.51**	**10.697**	**10.309**	38.800	**0.388**	**1 IN 100**	225	64.781	0.78
A3.03	A3.02	**50.51**	**10.284**	**9.896**	38.800	**0.388**	**1 IN 100**	225	64.781	0.78
A3.04	A3.03	**50.51**	**9.871**	**9.583**	28.800	**0.288**	**1 IN 100**	225	64.781	0.78
A3.05	A3.04	**50.51**	**9.558**	**9.448**	10.917	**0.109**	**1 IN 100**	225	64.781	0.78
A3.06	A3.04 + A4.00	**83.02**	**9.423**	**9.177**	24.665	**0.247**	**1 IN 100**	300	138.210	0.60
A4.00	BK2.1	**32.51**	**12.182**	**11.965**	1.300	**0.217**	**1 IN 6**	225	213.460	0.15
A1.06	A1.05 + A3.06	**132.65**	**9.152**	**9.130**	2.200	**0.022**	**1 IN 100**	350	207.260	0.64
A1.07	A1.06	**132.65**	**9.030**	**9.001**	2.912	**0.029**	**1 IN 100**	350	207.260	0.64
A1.08	A1.07	**132.65**	**8.976**	**8.780**	19.614	**0.196**	**1 IN 100**	350	207.260	0.64

2387 - Nether Lochaber - Carrier Pipes

PIPE NETWORK A:			*Ref. drainage schedule* ↓	*Ref. drainage schedule* ↓						
RUN REF	**CONTRIBUTIONS TO FLOW**	**TOTAL FLOW (l/s)**	**INVERT LEVEL AT START OF RUN (mCD)**	**INVERT LEVEL AT END OF RUN (mCD)**	**PIPE LENGTH (m)**	**START & END INVERT HEIGHT DIFFERENCE (m)**	**PIPE GRADIENT**	**REQUIRED PIPE DIAMETER**	**DISCHARGE CAPACITY (l/s)**	**UTILISATION**
PIPE NETWORK B:										
B1.00	FD1	43.31	9.900	8.982	18.365	0.918	1 IN 20	225	149.580	0.29
B2.00	G1	6.12	9.665	9.152	10.257	0.513	1 IN 20	150	51.543	0.12
B3.00	G2	3.31	9.738	9.348	7.800	0.390	1 IN 20	150	51.543	0.06
B4.00	BK1.6 + BK1.7	45.33	9.762	8.535	18.400	1.227	1 IN 15	225	171.180	0.26
B1.01	B1.00 + B2.00 + B3.00 + B4.00	98.07	8.510	7.635	17.500	0.875	1 IN 20	300	317.890	0.31
B5.00	G3	2.77	9.228	8.678	10.994	0.550	1 IN 20	150	51.543	0.05
B6.00	FD2	10.84	9.226	8.535	13.826	0.691	1 IN 20	225	149.580	0.07
B7.00	G4	4.38	8.902	8.687	2.150	0.215	1 IN 10	150	73.701	0.06
B1.02	B1.01 + B5.00 + B6.00 + B7.00	116.07	7.610	7.160	22.500	0.450	1 IN 50	300	198.230	0.59
B8.00	G5	5.71	8.687	8.313	11.229	0.374	1 IN 30	150	40.877	0.14
B9.00	FD3	14.19	9.038	8.298	14.801	0.740	1 IN 20	225	149.580	0.09
B10.00	G6	5.58	8.601	8.171	2.150	0.430	1 IN 5	150	73.701	0.08
B1.03	B1.02 + B8.00 + B9.00 + B10.00	141.55	7.135	6.925	10.500	0.210	1 IN 50	300	198.230	0.71
B11.00	G7	5.46	8.515	8.085	2.150	0.430	1 IN 5	150	73.701	0.07
B1.04	B1.03 + B11.00	147.01	6.900	6.627	13.646	0.273	1 IN 50	300	198.230	0.74
B12.00	G8	5.79	8.437	7.994	4.431	0.443	1 IN 10	150	73.701	0.08
B13.00	G9	2.03	8.437	7.942	9.910	0.496	1 IN 20	150	51.543	0.04
B14.00	FD4	19.36	8.677	7.936	11.117	0.741	1 IN 15	225	171.180	0.11
B15.00	Threshold drain, flow negligible, take 1l/s	1.00	8.792	7.848	7.553	0.944	1 IN 8	150	73.701	0.01
B1.05	B1.04 + B12.00 + B13.00 + B14.00 + B15.00	175.18	6.602	6.477	12.590	0.126	1 IN 100	350	207.260	0.85
B16.00	Threshold drain, flow negligible, take 1l/s	1.00	8.792	7.721	8.570	1.071	1 IN 8	150	73.701	0.01
B17.00	Threshold drain, flow negligible, take 1l/s	1.00	8.792	7.847	4.725	0.945	1 IN 5	150	73.701	0.01
B1.06	B1.05 + B16.00 + B17.00	177.18	6.452	6.336	11.556	0.116	1 IN 100	350	207.260	0.85

2387 - Nether Lochaber - Carrier Pipes

PIPE NETWORK A:

RUN REF	CONTRIBUTIONS TO FLOW	TOTAL FLOW (l/s)	*Ref. drainage schedule* ↓ INVERT LEVEL AT START OF RUN (mCD)	*Ref. drainage schedule* ↓ INVERT LEVEL AT END OF RUN (mCD)	PIPE LENGTH (m)	START & END INVERT HEIGHT DIFFERENCE (m)	PIPE GRADIENT	REQUIRED PIPE DIAMETER	DISCHARGE CAPACITY (l/s)	UTILISATION
B18.00	FD5	14.48	8.442	6.934	15.076	1.508	1 IN 10	225	213.460	0.07
B1.07	B1.06 + B18.00	191.66	6.311	6.184	12.672	0.127	1 IN 100	350	207.260	0.92
B19.00	FD6	12.33	7.995	7.326	6.693	0.669	1 IN 10	225	213.460	0.06
B20.00	BK4.1 + BK4.2	80.74	7.762	6.598	23.273	1.164	1 IN 20	225	149.580	0.54
B21.00	BK3.1 + BK3.2 + BK3.3	39.96	7.212	6.382	8.297	0.830	1 IN 10	225	213.460	0.19
B20.01	B20.00 + B21.00	120.70	6.357	6.266	9.128	0.091	1 IN 100	300	138.210	0.87
B22.00	G10	4.76	6.750	6.482	13.408	0.268	1 IN 50	150	31.971	0.15
B23.00	CD1	13.86	6.627	6.330	14.860	0.297	1 IN 50	150	31.971	0.43
B24.00	FD7	33.30	6.803	6.130	10.095	0.673	1 IN 15	225	171.180	0.19
B22.01	B22.00 + B23.00 + B24.00	51.91	6.105	5.956	7.454	0.149	1 IN 50	225	93.090	0.56
B1.08	B1.07 + B19.00 + B20.01 + B23.01	376.60	5.931	5.800	6.527	0.131	1 IN 50	500	755.500	0.50
B1.09	B1.08	376.60	5.700	5.660	2.000	0.040	1 IN 50	500	755.500	0.50
B1.10	B1.09	376.60	5.635	5.548	4.370	0.087	1 IN 50	500	755.500	0.50

2387 - Nether Lochaber - Drainage Network Schedule

Invert level information:

Gully invert depth =	0.750 m	*based on 150mmØ pipe*
Channel drain invert depth =	0.373 m	*based on 150mmØ pipe*
Beany kerb invert depth =	0.738 m	*based on 225mmØ pipe*
Filter drain invert depth =	0.600 m	
Threshold drain invert depth =	0.400 m	

Incoming & outgoing pipe - height differences:

Manhole difference =	0.025 m
Interceptor difference =	0.100 m

Manhole parts = 0.460 m

DETAILS						INCOMING PIPES			OUTGOING PIPES					*Chamber Checks*	
REF	DESCRIPTION	EASTING	NORTHING	COVER/FRAME TYPE	COVER LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)	PIPE LENGTH (m)	PIPE GRADIENT	*Depth to Pipe Soffit (m)*	*Chamber Height (m)*
PIPE NETWORK A:															
A1	BEANY KERB OUTLET	CAD	CAD	-	12.590	-	-	-	A1.00	225	11.852	1.749	1 IN 20	-	-
A2	MANHOLE - TYPE C	CAD	CAD	C250	12.636	A1.00	225	11.765	A1.01	225	11.740	47.028	1 IN 100	*0.671*	*0.211*
A3	MANHOLE - TYPE B 1200Ø	CAD	CAD	C250	12.887	A1.01	225	11.269	A1.02	225	11.244	46.933	1 IN 100	*1.418*	*0.958*
A4	BEANY KERB OUTLET	CAD	CAD	-	12.960	-	-	-	A2.00	225	12.222	0.648	1 IN 10	-	-
A5	MANHOLE - TYPE B 1200Ø	CAD	CAD	C250	13.031	A1.02	225	10.775	A1.03	225	10.750	28.906	1 IN 100	*2.056*	*1.596*
						A2.00	225	12.157							
A6	MANHOLE - TYPE B 1200Ø	CAD	CAD	C250	12.732	A1.03	225	10.461	A1.04	225	10.436	11.334	1 IN 100	*2.071*	*1.611*
A7	MANHOLE - TYPE B 1200Ø	CAD	CAD	C250	12.244	A1.04	225	10.323	A1.05	225	10.298	20.300	1 IN 100	*1.721*	*1.261*
A8	BEANY KERB OUTLET	CAD	CAD	-	11.920	-	-	-	A3.00	225	11.182	0.613	1 IN 20	-	-
A9	MANHOLE - TYPE C	CAD	CAD	C250	12.016	A3.00	225	11.151	A3.01	225	11.126	36.426	1 IN 90	*0.665*	*0.205*
A10	MANHOLE - TYPE B 1200Ø	CAD	CAD	C250	12.317	A3.01	225	10.722	A3.02	225	10.697	38.800	1 IN 100	*1.395*	*0.935*
A11	MANHOLE - TYPE B 1200Ø	CAD	CAD	C250	12.775	A3.02	225	10.309	A3.03	225	10.284	38.800	1 IN 100	*2.266*	*1.806*
A12	MANHOLE - TYPE B 1200Ø	CAD	CAD	C250	13.234	A3.03	225	9.896	A3.04	225	9.871	28.800	1 IN 100	*3.138*	*2.678*
A13	MANHOLE - TYPE B 1200Ø	CAD	CAD	C250	13.154	A3.04	225	9.583	A3.05	225	9.558	10.917	1 IN 100	*3.371*	*2.911*
A14	BEANY KERB OUTLET	CAD	CAD	-	12.920	-	-	-	A4.00	225	12.182	1.300	1 IN 6	-	-
A15	MANHOLE - TYPE B 1200Ø	CAD	CAD	C250	12.966	A3.05	225	9.448	A3.06	300	9.423	24.665	1 IN 100	*3.243*	*2.783*
						A4.00	225	11.965							
A16	MANHOLE - TYPE B 1200Ø	CAD	CAD	C250	11.890	A1.05	225	10.095	A1.06	350	9.152	2.200	1 IN 100	*2.388*	*1.928*
						A3.06	300	9.177							
A17	SPEL P150 1C/SC	CAD	CAD	-	VARIES	A1.06	350	9.130	A1.07	350	9.030	2.912	1 IN 100	-	-
A18	MANHOLE - TYPE B 1200Ø	CAD	CAD	C250	10.789	A1.07	350	9.001	A1.08	350	8.976	19.614	1 IN 100	*1.463*	*1.003*
A19	OUTFALL	CAD	CAD	-	-	A1.08	350	8.780	-	-	-	-	-	-	-

2387 - Nether Lochaber - Drainage Network Schedule

Invert level information:

Gully invert depth =	0.750 m	*based on 150mmØ pipe*
Channel drain invert depth =	0.373 m	*based on 150mmØ pipe*
Beany kerb invert depth =	0.738 m	*based on 225mmØ pipe*
Filter drain invert depth =	0.600 m	
Threshold drain invert depth =	0.400 m	

Incoming & outgoing pipe - height differences:

Manhole difference =	0.025 m
Interceptor difference =	0.100 m

Manhole parts = 0.460 m

DETAILS						INCOMING PIPES			OUTGOING PIPES					*Chamber Checks*	
REF	DESCRIPTION	EASTING	NORTHING	COVER/FRAME TYPE	COVER LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)	PIPE LENGTH (m)	PIPE GRADIENT	*Depth to Pipe Soffit (m)*	*Chamber Height (m)*
PIPE NETWORK B:															
B1	FILTER DRAIN OUTLET	CAD	CAD	-	10.500	-	-	-	B1.00	225	9.900	18.365	1 IN 20	-	-
B2	GULLY	CAD	CAD	D400	10.415	-	-	-	B2.00	150	9.665	10.257	1 IN 20	-	-
B3	GULLY	CAD	CAD	D400	10.488	-	-	-	B3.00	150	9.738	7.800	1 IN 20	-	-
B4	BEANY KERB OUTLET	CAD	CAD	-	10.500	-	-	-	B4.00	225	9.762	18.400	1 IN 15	-	-
B5	MANHOLE - TYPE B 1500Ø	CAD	CAD	C250	10.341	B1.00	225	8.982	B1.01	300	8.510	17.500	1 IN 20	*1.531*	*1.071*
						B2.00	150	9.152							
						B3.00	150	9.348							
						B4.00	225	8.535							
B6	GULLY	CAD	CAD	D400	9.978	-	-	-	B5.00	150	9.228	10.994	1 IN 20	-	-
B7	FILTER DRAIN OUTLET	CAD	CAD	-	9.964	-	-	-	B6.00	225	9.226	13.826	1 IN 20	-	-
B8	GULLY	CAD	CAD	D400	9.652	-	-	-	B7.00	150	8.902	2.150	1 IN 10	-	-
B9	MANHOLE - TYPE B 1500Ø	CAD	CAD	C250	9.691	B1.01	300	7.635	B1.02	300	7.610	22.500	1 IN 50	*1.781*	*1.321*
						B5.00	150	8.678							
						B6.00	225	8.535							
						B7.00	150	8.687							
B10	GULLY	CAD	CAD	D400	9.437	-	-	-	B8.00	150	8.687	11.229	1 IN 30	-	-
B11	FILTER DRAIN OUTLET	CAD	CAD	-	9.638	-	-	-	B9.00	225	9.038	14.801	1 IN 20	-	-
B12	GULLY	CAD	CAD	D400	9.351	-	-	-	B10.00	150	8.601	2.150	1 IN 5	-	-
B13	MANHOLE - TYPE B 1500Ø	CAD	CAD	C250	9.390	B1.02	300	7.160	B1.03	300	7.135	10.500	1 IN 50	*1.955*	*1.495*
						B8.00	150	8.313							
						B9.00	225	8.298							
						B10.00	150	8.171							
B14	GULLY	CAD	CAD	D400	9.265	-	-	-	B11.00	150	8.515	2.150	1 IN 5	-	-
B15	MANHOLE - TYPE B 1500Ø	CAD	CAD	C250	9.304	B1.03	300	6.925	B1.04	300	6.900	13.646	1 IN 50	*2.104*	*1.644*
						B11.00	150	8.085							
B16	GULLY	CAD	CAD	D400	9.187	-	-	-	B12.00	150	8.437	4.431	1 IN 10	-	-
B17	GULLY	CAD	CAD	D400	9.187	-	-	-	B13.00	150	8.437	9.910	1 IN 20	-	-
B18	FILTER DRAIN OUTLET	CAD	CAD	-	9.277	-	-	-	B14.00	225	8.677	11.117	1 IN 15	-	-
B19	THRESHOLD DRAIN OUTLET	CAD	CAD	-	9.192	-	-	-	B15.00	110	8.792	7.553	1 IN 8	-	-
B20	MANHOLE - TYPE B 1500Ø	CAD	CAD	C250	9.168	B1.04	300	6.627	B1.05	350	6.602	12.590	1 IN 100	*2.216*	*1.756*
						B12.00	150	7.994							
						B13.00	150	7.942							
						B14.00	225	7.936							
						B15.00	110	7.848							
B21	THRESHOLD DRAIN OUTLET	CAD	CAD	-	9.192	-	-	-	B16.00	110	8.792	8.570	1 IN 8	-	-
B22	THRESHOLD DRAIN OUTLET	CAD	CAD	-	9.192	-	-	-	B17.00	110	8.792	4.725	1 IN 5	-	-
B23	MANHOLE - TYPE B 1500Ø	CAD	CAD	C250	8.984	B1.05	350	6.477	B1.06	350	6.452	11.556	1 IN 100	*2.182*	*1.722*
						B16.00	110	7.721							
						B17.00	110	7.847							

2387 - Nether Lochaber - Drainage Network Schedule

Invert level information:

Gully invert depth =	0.750 m	*based on 150mmØ pipe*
Channel drain invert depth =	0.373 m	*based on 150mmØ pipe*
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Filter drain invert depth =	0.600 m	
Threshold drain invert depth =	0.400 m	

Incoming & outgoing pipe - height differences:

Manhole difference =	0.025 m
Interceptor difference =	0.100 m

Manhole parts = 0.460 m

DETAILS						INCOMING PIPES			OUTGOING PIPES					*Chamber Checks*	
REF	DESCRIPTION	EASTING	NORTHING	COVER/FRAME TYPE	COVER LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)	PIPE LENGTH (m)	PIPE GRADIENT	*Depth to Pipe Soffit (m)*	*Chamber Height (m)*
B24	FILTER DRAIN OUTLET	CAD	CAD	-	9.042	-	-	-	B18.00	225	8.442	15.076	1 IN 10	-	-
B25	MANHOLE - TYPE B 1500Ø	CAD	CAD	C250	8.719	B1.06	350	6.336	B1.07	350	6.311	12.672	1 IN 100	*2.058*	*1.598*
						B18.00	225	6.934							
B26	FILTER DRAIN OUTLET	CAD	CAD	-	8.595	-	-	-	B19.00	225	7.995	6.693	1 IN 10	-	-
B27	BEANY KERB OUTLET	CAD	CAD	-	8.500	-	-	-	B20.00	225	7.762	23.273	1 IN 20	-	-
B28	BEANY KERB OUTLET	CAD	CAD	-	7.950	-	-	-	B21.00	225	7.212	8.297	1 IN 10	-	-
B29	MANHOLE - TYPE B 1200Ø	CAD	CAD	D400	7.885	B20.00	225	6.598	B20.01	300	6.357	9.128	1 IN 100	*1.528*	*1.068*
						B21.00	225	6.382							
B30	GULLY	CAD	CAD	D400	7.500	-	-	-	B22.00	150	6.750	13.408	1 IN 50	-	-
B31	CHANNEL DRAIN OUTLET	CAD	CAD	-	7.000	-	-	-	B23.00	150	6.627	14.860	1 IN 50	-	-
B32	FILTER DRAIN OUTLET	CAD	CAD	-	7.403	-	-	-	B24.00	225	6.803	10.095	1 IN 15	-	-
B33	MANHOLE - TYPE B 1500Ø	CAD	CAD	C250	7.865	B22.00	150	6.482	B22.01	225	6.105	7.454	1 IN 50	*1.535*	*1.075*
						B23.00	150	6.330							
						B24.00	225	6.130							
B34	MANHOLE - TYPE B 1500Ø	CAD	CAD	C250	8.286	B1.07	350	6.184	B1.08	500	5.931	6.527	1 IN 50	*1.855*	*1.395*
						B19.00	225	7.326							
						B20.01	300	6.266							
						B22.01	225	5.956							
B35	SPEL P400 1C/SC	CAD	CAD	-	VARIES	B1.08	500	5.800	B1.09	500	5.700	2.000	1 IN 50	-	-
B36	MANHOLE - TYPE B 1200Ø	CAD	CAD	C250	7.572	B1.09	500	5.660	B1.10	500	5.635	4.370	1 IN 50	*1.437*	*0.977*
B37	OUTFALL	CAD	CAD	-	-	B1.10	500	5.548	-	-	-	-	-	-	-

A15

(p.3 of 4)

k_s = 0·060 mm
S = 0·00400 to 0·02000

ie hydraulic gradient =
1 in 250 to 1 in 50

Water (or sewage) at 15°C;
full bore conditions.

velocities in ms^{-1}
discharges in litres/sec

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Gradient	(Equivalent) Pipe diameters in mm													
	150	200	225	250	275	300	350	375	400	450	500	525	600	630
0·00400	0·770	0·929	1·003	1·074	1·142	1·207	1·332	1·392	1·450	1·562	1·669	1·721	1·870	1·928
1/ 250	13·599	29·196	39·889	52·717	67·823	85·345	128·17	153·72	182·20	248·39	327·66	372·46	528·81	601·01
0·00420	0·790	0·954	1·030	1·102	1·172	1·239	1·367	1·428	1·488	1·602	1·712	1·765	1·919	1·978
1/ 238	13·961	29·967	40·940	54·102	69·600	87·578	131·51	157·73	186·94	254·84	336·14	382·10	542·47	616·51
0·00440	0·810	0·978	1·055	1·130	1·201	1·270	1·401	1·463	1·524	1·642	1·754	1·809	1·966	2·026
1/ 227	14·314	30·720	41·986	55·455	71·338	89·760	134·78	161·64	191·57	261·14	344·44	391·52	555·80	631·66
0·00460	0·830	1·001	1·081	1·157	1·230	1·300	1·434	1·498	1·561	1·681	1·796	1·851	2·012	2·074
1/ 217	14·660	31·457	42·970	56·779	73·037	91·894	137·97	165·46	196·10	267·30	352·55	400·73	568·85	646·47
0·00480	0·849	1·024	1·105	1·183	1·258	1·330	1·467	1·532	1·596	1·719	1·836	1·893	2·057	2·120
1/ 208	14·998	32·179	43·953	58·075	74·701	93·984	141·10	169·21	200·53	273·33	360·48	409·74	581·62	660·97
0·00500	0·868	1·047	1·130	1·209	1·285	1·359	1·498	1·565	1·630	1·756	1·876	1·934	2·101	2·166
1/ 200	15·330	32·886	44·917	59·345	76·332	96·032	144·16	172·95	204·88	279·24	368·26	418·53	594·13	675·17
0·00550	0·913	1·101	1·188	1·272	1·352	1·429	1·575	1·646	1·714	1·846	1·971	2·032	2·208	2·276
1/ 182	15·933	34·597	47·247	62·417	80·274	100·98	151·57	181·75	215·33	293·52	387·06	439·93	624·36	709·51
0·00600	0·956	1·153	1·244	1·331	1·415	1·496	1·649	1·722	1·794	1·931	2·063	2·127	2·310	2·381
1/ 167	16·503	36·234	49·477	65·359	84·048	105·72	158·82	190·34	225·43	307·18	405·01	460·35	653·22	742·93
0·00650	0·998	1·203	1·298	1·389	1·476	1·560	1·720	1·796	1·871	2·014	2·151	2·217	2·409	2·482
1/ 154	17·242	37·826	51·619	68·177	87·656	110·27	165·47	198·55	235·07	320·70	422·80	479·95	681·03	773·94
0·00700	1·038	1·252	1·350	1·444	1·535	1·622	1·788	1·867	1·945	2·093	2·235	2·304	2·503	2·580
1/ 143	17·951	39·326	53·683	70·895	91·156	114·65	172·02	206·34	244·05	332·92	438·92	498·81	707·74	804·18
0·00750	1·077	1·298	1·400	1·498	1·591	1·682	1·854	1·936	2·016	2·170	2·317	2·388	2·594	2·674
1/ 133	18·634	40·789	55·672	73·520	94·535	118·83	178·55	213·91	253·02	345·11	454·98	517·03	733·52	833·49
0·00800	1·115	1·343	1·449	1·550	1·646	1·740	1·917	2·002	2·085	2·244	2·396	2·470	2·683	2·765
1/ 125	19·286	42·199	57·601	76·081	97·755	122·97	184·77	221·34	261·77	356·91	470·63	534·89	758·49	861·79
0·00850	1·152	1·387	1·496	1·600	1·700	1·796	1·979	2·067	2·152	2·316	2·473	2·549	2·768	2·853
1/ 118	19·920	43·573	59·471	78·528	100·95	126·91	190·77	228·59	270·41	368·55	485·91	551·95	783·87	889·14
0·00900	1·187	1·429	1·541	1·648	1·751	1·850	2·039	2·129	2·217	2·386	2·547	2·625	2·851	2·938
1/ 111	20·527	44·905	61·285	80·920	104·02	130·80	196·62	235·59	278·51	379·66	500·70	568·35	808·19	916·95
0·00950	1·222	1·471	1·586	1·696	1·802	1·904	2·097	2·190	2·280	2·454	2·620	2·700	2·932	3·022
1/ 105	21·123	46·227	63·097	83·293	107·11	134·66	202·32	242·43	286·64	390·67	514·97	584·91	831·26	947·91
0·01000	1·255	1·511	1·629	1·742	1·851	1·955	2·154	2·249	2·342	2·520	2·690	2·773	3·011	3·103
1/ 100	21·694	47·493	64·821	85·501	110·02	138·31	207·85	248·99	294·27	401·31	528·96	600·75	853·76	973·20
0·01100	1·320	1·589	1·713	1·831	1·945	2·055	2·264	2·364	2·461	2·648	2·826	2·913	3·163	3·259
1/ 91	22·822	49·916	68·138	89·853	115·64	145·35	218·51	261·76	309·24	421·82	555·93	630·81	896·91	1023·0
0·01200	1·383	1·663	1·793	1·917	2·036	2·151	2·369	2·473	2·575	2·770	2·957	3·047	3·308	3·409
1/ 83	23·911	52·253	71·337	94·060	121·05	152·11	228·65	273·94	323·64	441·55	581·91	659·62	938·05	1071·6
0·01300	1·442	1·735	1·870	1·999	2·123	2·242	2·469	2·578	2·684	2·887	3·082	3·176	3·448	3·552
1/ 77	24·936	54·438	74·340	98·014	126·16	158·52	238·28	285·54	337·34	460·17	606·06	687·15	977·78	1117·0
0·01400	1·500	1·803	1·944	2·078	2·206	2·330	2·566	2·679	2·789	3·000	3·202	3·300	3·582	3·690
1/ 71	25·903	56·568	77·230	101·83	131·05	164·72	247·51	296·59	350·44	477·91	629·67	714·27	1015·7	1159·4
0·01500	1·555	1·870	2·015	2·154	2·287	2·415	2·660	2·777	2·890	3·109	3·318	3·419	3·711	3·824
1/ 67	26·841	58·642	80·019	105·52	135·84	170·71	256·50	307·36	363·10	494·45	651·46	740·14	1049·3	1199·0
0·01600	1·609	1·934	2·084	2·228	2·365	2·498	2·750	2·871	2·988	3·214	3·430	3·535	3·837	3·953
1/ 63	27·754	60·661	82·760	109·14	140·42	176·55	264·61	317·09	375·52	511·21	673·52	765·17	1084·7	1232·2
0·01700	1·661	1·996	2·151	2·299	2·441	2·578	2·838	2·962	3·083	3·316	3·539	3·647	3·958	4·078
1/ 59	28·656	62·719	85·530	112·85	144·98	182·21	273·05	327·19	387·48	527·46	694·83	789·43	1119·1	1271·2
0·01800	1·712	2·057	2·216	2·368	2·515	2·655	2·923	3·051	3·176	3·416	3·645	3·756	4·076	4·199
1/ 56	29·551	64·620	88·118	116·26	149·35	187·70	281·25	337·01	399·09	543·24	715·63	813·00	1152·4	1309·0
0·01900	1·761	2·116	2·280	2·436	2·586	2·731	3·006	3·138	3·266	3·512	3·748	3·862	4·191	4·317
1/ 53	30·432	66·471	90·636	119·53	153·61	193·03	289·23	346·56	410·39	558·59	735·83	835·93	1184·9	1345·9
0·02000	1·809	2·173	2·341	2·502	2·656	2·804	3·087	3·222	3·353	3·606	3·848	3·965	4·302	4·433
1/ 50	31·301	68·274	93·090	122·81	157·75	198·23	297·00	355·86	421·39	573·55	755·50	858·26	1216·5	1381·7
	110	140	160	180	190	210	250	260	280	320	350	370	420	440

θ_{medial} **for part–full circular pipes.**

k_s = 0·060 mm S = 0·00400 to 0·02000

k_s = 0·060 mm
S = 0·02000 to 0·10000

ie hydraulic gradient =
1 in 50 to 1 in 10

Water (or sewage) at 15°C;
full bore conditions.

velocities in ms^{-1}
discharges in litres/sec

Gradient	(Equivalent) Pipe diameters in mm													
	150	200	225	250	275	300	350	375	400	450	500	525	600	630
0·02000	1·809	2·173	2·341	2·502	2·656	2·804	3·087	3·222	3·353	3·606	3·848	3·965	4·302	4·433
1/ 50	31·971	68·274	93·090	122·81	157·75	198·23	297·00	355·86	421·39	573·55	755·50	858·26	1216·5	1381·7
0·02200	1·902	2·284	2·460	2·629	2·790	2·946	3·243	3·384	3·522	3·788	4·041	4·164	4·518	4·654
1/ 45·5	33·609	71·753	97·822	129·04	165·74	208 26	311·99	373·80	442·62	602·39	793·44	901·33	1277·4	1450·9
0·02400	1·991	2·390	2·574	2·750	2·919	3·082	3·392	3·540	3·684	3·961	4·226	4·354	4·724	4·867
1/ 41·7	35·176	75·078	102·35	135·00	173·38	217·85	326·32	390·95	462·91	629·95	829·70	942·50	1335·7	1517·0
0·02600	2·076	2·491	2·683	2·867	3·043	3·212	3·535	3·689	3·839	4·127	4·403	4·536	4·922	5·070
1/ 38·5	36·679	78·270	106·69	140·71	180·72	227·05	340 07	407·40	482·37	656·40	864·48	981·99	1391·5	1580·5
0·02800	2·158	2·589	2·788	2·979	3·161	3·337	3·672	3·832	3·988	4·287	4·573	4·712	5·112	5·266
1/ 35·7	38 127	81·343	110·87	146·22	187·77	235·90	353 30	423·24	501·11	681·86	897·97	1020·0	1445·3	1641·5
0·03000	2·237	2·684	2·890	3·087	3·276	3·458	3·805	3·970	4·132	4·442	4·738	4·881	5·295	5·455
1/ 33·3	39·524	84·309	114·90	151·53	194 58	244·45	366·07	438·53	519·19	706 43	930 28	1056·7	1497·2	1700·4
0·03200	2·313	2·775	2·988	3·192	3·387	3·575	3·933	4·104	4·271	4·591	4·897	5·045	5·473	5·638
1/ 31·3	40·877	87·179	118·81	156·67	201·18	252·72	378 43	453·32	536·68	730 19	961·54	1092 2	1547·4	1757·4
0·03400	2·387	2·864	3·083	3·293	3·495	3·689	4·058	4·234	4·406	4·736	5·051	5·204	5·645	5·815
1/ 29·4	42·188	89·962	122 59	161 65	207 56	260 74	390 41	467·65	553·64	753 23	991·84	1126·6	1596 1	1812·6
0·03600	2·459	2·950	3·176	3·392	3·599	3·799	4·179	4·360	4·537	4·877	5·201	5·358	5·812	5·987
1/ 27·8	43 462	92·665	126·27	166 49	213 77	268 52	402 04	481·57	570 11	775 61	1021·3	1160 0	1643·4	1866·3
0·03800	2·530	3·033	3·266	3·488	3·701	3·906	4·296	4·483	4·664	5·014	5·347	5·509	5·975	6·154
1/ 26·3	44 701	95 294	129 85	171·20	219·81	276 10	413 36	495·12	586·13	797·37	1049 9	1192 5	1689·3	1918 5
0·04000	2·598	3·115	3·353	3·581	3·800	4·010	4·411	4·602	4·788	5·147	5·489	5·655	6·133	6·317
1/ 25·0	45·909	97·856	133·33	175 79	225 69	283 48	424 38	508 31	601·74	818 58	1077·8	1224 1	1734 1	1969 3
0·04200	2·665	3·194	3·439	3·672	3·896	4·112	4·523	4·719	4·910	5·277	5·628	5·797	6·288	6·477
1/ 23·8	47 087	100 36	136 78	180·26	231·43	290·67	435 14	521·18	616·96	839 26	1105 0	1255 0	1777·8	2018·9
0·04400	2·730	3·272	3·522	3·761	3·991	4·212	4·632	4·833	5·028	5·404	5·763	5·937	6·439	6·632
1/ 22·7	48 238	102·80	140·05	184·63	237·03	297 70	445 64	533·75	631·83	859·46	1131·5	1285 1	1820·4	2067·3
0·04600	2·793	3·348	3·604	3·848	4·083	4·309	4·739	4·944	5·144	5·528	5·895	6·073	6·586	6·784
1/ 21·7	49 369	105 18	143 29	188 91	242 51	304 59	455 51	546 04	646·37	879 20	1157 5	1314 8	1862 1	2114·6
0·04800	2·856	3·422	3·684	3·934	4·173	4·404	4·843	5·053	5·257	5·650	6·025	6·206	6·730	6·932
1/ 20·8	50 464	107 52	146 47	193 09	247 87	311 35	465 28	558 05	660 59	898 52	1182 5	1343 5	1903·0	2161·0
0·05000	2·917	3·495	3·762	4·017	4·262	4·497	4·945	5·159	5·368	5·769	6·151	6·337	6·872	7·078
1/ 20·0	51 543	109 81	149 55	197 16	253 12	317 69	475 30	569 54	674 52	917 45	1207 0	1371 7	1942 9	2206·3
0·05500	3·064	3·671	3·951	4·219	4·475	4·722	5·193	5·417	5·636	6·056	6·458	6·652	7·213	7·429
1/ 18·2	54 160	115 34	157 10	207 09	265 91	333 81	498 59	598 37	708 18	963 12	1267 9	1440 0	2039 5	2315·9
0·06000	3·205	3·839	4·132	4·411	4·679	4·938	5·429	5·663	5·892	6·331	6·750	6·953	7·540	7·765
1/ 16·7	56 652	120 62	164 23	218 54	277 84	348 02	522 31	625 50	740 35	1008 0	1325 4	1505 2	2131 9	2420 7
0·06500	3·341	4·001	4·305	4·596	4·875	5·144	5·655	5·900	6·137	6·594	7·031	7·242	7·853	8·088
1/ 15·4	59 034	125 69	171 12	227 62	289 57	363 62	544 11	651 59	771 21	1049 0	1380 5	1567 8	2220 3	2521 1
0·07000	3·471	4·156	4·472	4·774	5·064	5·343	5·873	6·127	6·373	6·848	7·301	7·521	8·154	8·398
1/ 14·3	61 335	130 57	177 82	236 38	300 77	377 66	564 69	676 75	800 91	1089 1	1433 6	1628 2	2305 5	2617 9
0·07500	3·597	4·306	4·633	4·946	5·246	5·535	6·084	6·346	6·602	7·093	7·562	7·789	8·445	8·697
1/ 13·3	63 555	135 29	184 23	242 78	311 58	391 22	585 34	700 93	829 57	1128 1	1484 6	1686 1	2387 7	2711 1
0·08000	3·718	4·451	4·789	5·112	5·422	5·720	6·288	6·559	6·822	7·330	7·814	8·049	8·726	8·987
1/ 12·5	65 707	139 84	190 42	250·93	322 03	404 33	604 93	724·37	857·30	1165·7	1534·3	1742 3	2467·2	2801·4
0·08500	3·836	4·592	4·940	5·273	5·592	5·900	6·485	6·764	7·036	7·559	8·058	8·300	8·998	9·267
1/ 11·8	67 791	144 26	196 43	258 84	332 16	417 04	623 92	747·09	884 17	1202·2	1582 3	1796 8	2544·2	2883·8
0·09000	3·951	4·728	5·087	5·429	5·758	6·075	6·676	6·964	7·244	7·782	8·296	8·545	9·263	9·540
1/ 11·1	69 815	148·55	202 26	266·51	342·00	429 39	642·35	769·15	910·26	1237·7	1628 9	1849 7	2619·1	2973·8
0·09500	4·062	4·861	5·230	5·582	5·919	6·244	6·863	7·158	7·446	7·999	8·527	8·782	9·521	9·805
1/ 10·5	71 784	152 72	207·93	273 98	351·57	441·39	660 29	790·61	935·64	1272 1	1674 2	1901·2	2691·9	3056·4
0·10000	4·171	4·991	5·369	5·730	6·076	6·410	7·044	7·348	7·642	8·210	8·752	9·014	9·771	10·06
1/ 10·0	73 701	156 78	213 46	281 23	360·90	453·09	677·76	811·51	960 37	1305 7	1718 4	1951 3	2762·8	3136·9
	180	240	270	300	320	350	410	440	470	550	600	600	700	750

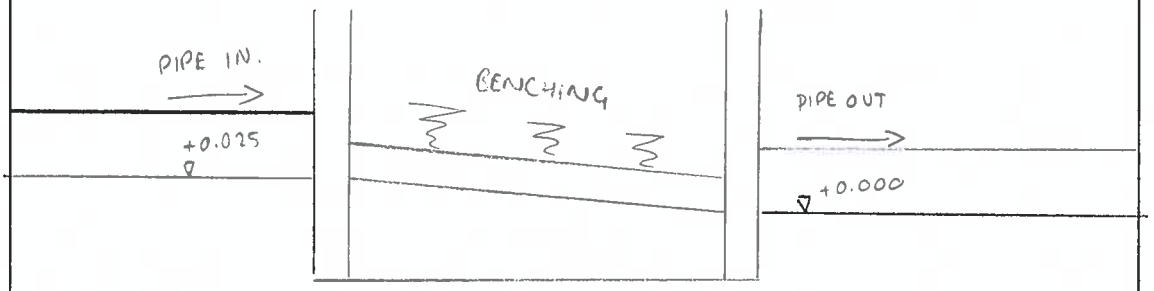
θ_{medial} for part–full circular pipes.

WALLACE STONE	Project : CORRAN FERRY	
Calculation Sheet	Job No. : 2387	Made By : CS
Description: NETHER LOCHABER DRAINAGE	Date : 29/01/24	Checked :
	Page No.: 34 of	

Output

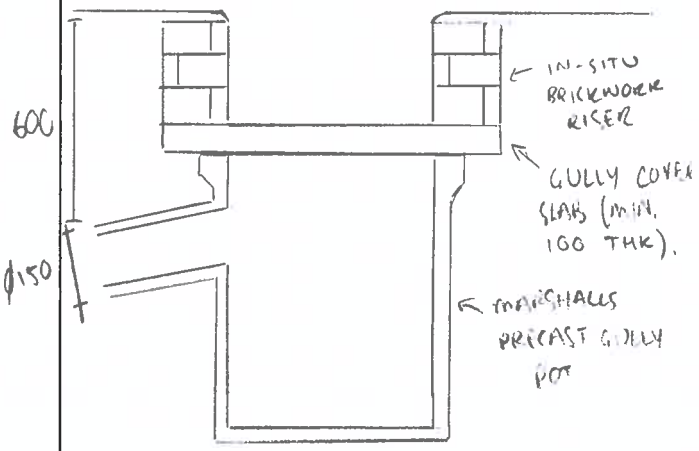
TYPICAL LEVEL CHANGE AT MANHOLE RINGS.

ASSUME A NOMINAL 25mm CHANGE IN INVERT LEVELS BETWEEN INCOMING AND OUTGOING PIPES AT MANHOLES,



TYPICAL MANHOLE SECTION (CHANGE IN LEVELS)

STANDARD GULLY DETAILS



STANDARD GULLY DETAIL

WALLACE STONE	Project : Corran Ferry	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Nether Lochaber Drainage	Date : 21/10/24	Checked :
	Page No.: 35 of	

Output

Separator

The majority of the A82 draining into the new site drainage system will be picked up by the kerb drains and transferred to a separator at the start of the marshalling area (Network A).

The remaining A82 drainage and the new marshalling area etc will be drained to a separator at the end of the marshalling area. (Network B)

Max flow at Network A = 133 l/s

Max flow at Network B = 377 l/s

Specify SPEL Puraceptor class 1 full retention separators - single chamber.

Propose :

Network A = P150 1c/sc = 150 l/s UR = 0.89

Network B = P400 1c/sc = 400 l/s UR = 0.94

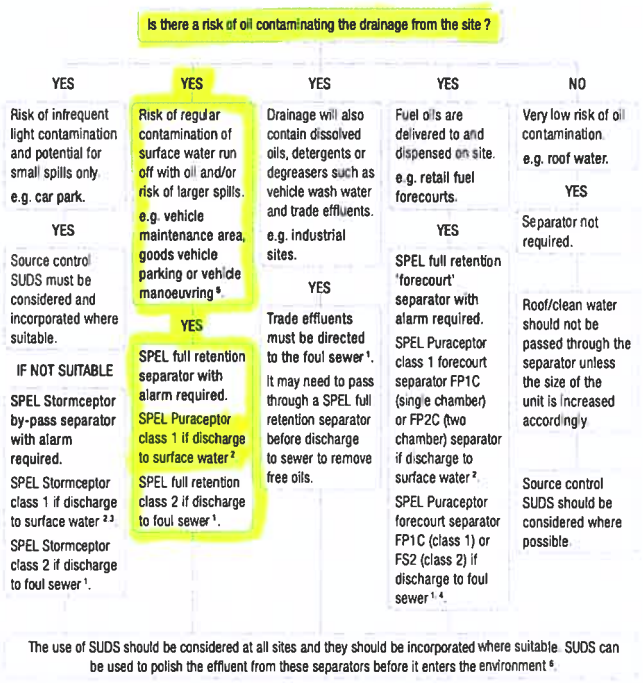
See attached sheets for selection process.

SPEL Separator range overview and how to select

How to select and specify to the Environment Agency's Pollution Prevention Guidelines PPG3

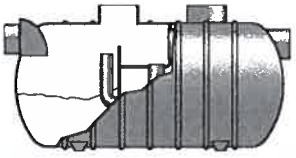
Notes to accompany the flowchart:

1. You must seek prior permission from your local sewer provider before you decide which separator to install and before you make any discharge.
2. You must seek prior permission from the Environment Agency before you decide which separator to install.
3. In this case, if it is considered that there is a low risk of pollution a source control SUDS scheme may be appropriate.
4. In certain circumstances, the sewer provider may require a class 1 separator for discharges to sewer to prevent explosive atmospheres from being generated.
5. Drainage from higher risk areas such as vehicle maintenance yards and goods vehicle parking areas should be connected to foul sewer in preference to surface water.
6. In certain circumstances, a separator may be one of the devices used in the SUDS scheme. Ask the Environment Agency for advice.



The use of SUDS should be considered at all sites and they should be incorporated where suitable. SUDS can be used to polish the effluent from these separators before it enters the environment [6].

SPEL Stormceptor® class 1 by-pass separators



SC – with silt capacity.

Typical sites

Infrequent light contamination – potential for small spills only eg. car parks.

Note: class 2 available if connection to foul sewer.

General description

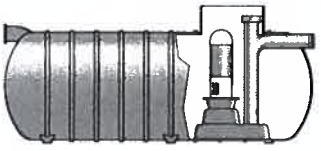
SPEL Stormceptors are the most widely used separators where it is acceptable to treat the 'first flush' ie. flows according to the nominal size (NSB) generated by rainfall rates of up to 6.5mm/hour. This covers most rainfall events in the UK. Any excess rainfall is by-passed without treatment.

Features

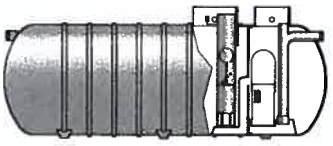
- **Long life efficient coalescer units.**
- **Good access to all parts for desludging.**
- **Nine different inlet/outlet orientations to suit site drainage lay-out.**

The SPEL Stormceptor was the first Environment Agency listed class 1 by-pass separator to BS EN 858-1:2002 (2001)

SPEL Puraceptor® class 1 full retention separators – single and two chamber models



Single chamber models – for full range see page 7



Two chamber models – for full range see page 8

Typical sites single chamber

Fuel storage and handling areas, filling stations, commercial vehicle/plant and contaminated industrial areas.

General description

The SPEL Puraceptor models are designed for high performance and long service life between maintenance periods.

The Puraceptor is available in two versions, single or two chamber, dependent upon the site application and requirements.

An automatic closure device (ACD) is fitted to close off the separator when the contained oil exceeds the maximum oil storage volume.

Features

- **Good access to all parts for desludging.**
- **One access shaft for desludging and servicing of ACD and coalescer unit.**
- **Sized for working capacity PLUS fuel/oil and silt containment, ensuring optimum performance between maintenance periods.**

Typical sites two chamber

High risk fuel storage areas, filling stations, railway fuelling and maintenance depots, fire training grounds etc.

Additional features

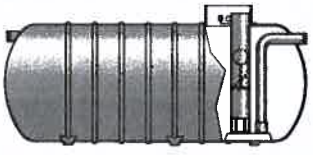
This is the model to cope with heavy levels of pollutants and silt.

The coalescer unit is mounted in the second chamber, providing a coalescence process for the separation of smaller globules of light liquid pollutants before final discharge to the surface water drain.

Being incorporated in the second chamber prevents blockage of the coalescer insert in the event of heavy spillages or heavy silt content in surface water. It can be simply lifted out for cleaning during routine maintenance.

The second access shaft provides easier access for desludging and maintenance of the coalescer.

SPEL full retention class 2 separators



Typical sites

Where risk of regular contamination of surface water run-off with discharge to foul sewer.

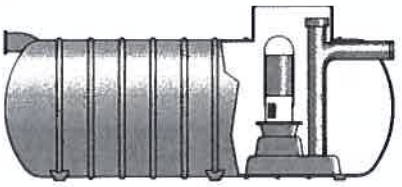
SPEL Puraceptor class 1 full retention separators – Single chamber models

Compliant to the European Standard BS EN 858-1:2002, the Environment Agency's Pollution Prevention Guidelines PPG3 and the Construction Products Regulations

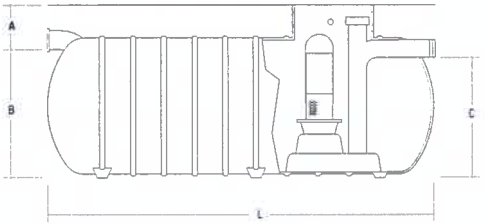
Model	Nominal size (NS) Series	Flow (l/s)	Catchment area (m²)	Oil storage (litres)	Silt capacity (litres)	Overall length* (mm) L	Overall diameter (mm)	Inlet Invert (mm) A	Base to inlet (mm) B	Base to outlet (mm) C	Max in/out pipe diameter (mm)	Number of access shafts (dia. mm) 600	750	900	1200
P004 1C/SC	200	4	222	40	400	1,720	1,225	630	1,110	1,050	160	-	1	-	-
P006 1C/SC	200	6	333	60	600	2,310	1,225	630	1,110	1,050	160	-	1	-	-
P010 1C/SC	200	10	556	100	1,000	3,410	1,225	630	1,110	1,050	160	-	1	-	-
P015 1C/SC	300	15	833	150	1,500	3,200	1,875	350	1,800	1,740	225	-	1	-	-
P020 1C/SC	300	20	1,111	200	2,000	3,540	1,875	350	1,800	1,740	225	1	1	-	-
FP 1C/SC	300	20	1,111	200	2,000	4,290	1,875	350	1,800	1,740	225		1	-	-
P030 1C/SC	300	30	1,667	300	3,000	4,420	1,875	390	1,760	1,700	300	1	-	1	-
P040 1C/SC	300	40	2,222	400	4,000	5,760	1,875	390	1,760	1,700	300	1	-	1	-
P050 1C/SC	300	50	2,778	500	5,000	7,060	1,875	390	1,760	1,700	300	1	-	1	-
P065 1C/SC	400	65	3,611	650	6,500	4,810	2,700	425	2,625	2,525	300	1	-	2	-
P080 1C/SC	400	80	4,444	800	8,000	5,700	2,700	425	2,625	2,525	300	1	-	2	-
P100 1C/SC	400	100	5,555	1,000	10,000	7,400	2,700	475	2,575	2,475	450	1	-	2	-
P125 1C/SC	400	125	6,944	1,250	12,500	8,580	2,700	475	2,575	2,475	450	-	1	2	-
P150 1C/SC	400	150	8,333	1,500	15,000	10,180	2,700	475	2,575	2,475	450	-	1	2	-
P165 1C/SC	400	165	9,166	1,650	16,500	11,200	2,700	500	2,550	2,450	450	2	1	1	-
P200 1C/SC	400	200	11,110	2,000	20,000	13,710	2,700	660	2,390	2,290	600	2	1	1	-
P250/1CSC	400	250	13,888	2,500	25,000	16,750	2,700	660	2,390	2,290	600	2	1	2	-
P280 1C/SC	400	280	15,555	2,800	28,000	18,800	2,700	660	2,390	2,290	600	1	2	2	-
P300 1C/SC	500	300	16,665	3,000	30,000	12,410	3,650	805	3,070	2,970	750	1	2	2	-
P400 1C/SC	500	400	22,220	4,000	40,000	15,760	3,650	805	3,070	2,970	750	2	2	2	-
P500 1C/SC	500	500	27,775	5,000	50,000	20,530	3,650	955	2,920	2,820	900	2	2	1	1
P500 1C/SC	600	500	27,775	5,000	50,000	16,040	4,150	925	3,250	3,150	900	2	2	1	1
P600 1C/SC	600	600	33,330	6,000	60,000	19,080	4,150	925	3,250	3,150	900	2	2	-	2
P700 1C/SC	600	700	38,888	7,000	70,000	21,460	4,150	925	3,250	3,150	900	3	2	3	-
P800 1C/SC	600	800	44,440	8,000	80,000	23,020	4,150	925	3,250	3,150	900	3	2	2	1
P900 1C/SC	600	900	49,846	9,000	90,000	24,658	4,150	925	3,250	3,150	900	3	2	-	3

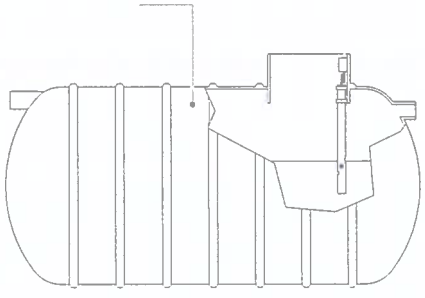
Model FP1C is a special forecourt unit with 7600 litre spillage holding capacity.

*Overall length subject to inlet/outlet size and orientation.



Single chamber models.





Alarm options:

1. SPEL Automatic oil alarm/monitoring system Model ALARM-DY Type 14400. No volt free terminals. Not BMS compatible. Flashing beacon optional extra.
2. SPEL Automatic oil alarm/monitoring system, Model OMS-1. Volt free connection and BMS compatible. Flashing beacon optional extra.
3. SPEL Automatic oil alarm/monitoring system, Model ALARM-1000. Two volt free connections, 300m range and BMS compatible. Flashing beacon optional extra, solar power and multi probe options available.

All alarms are IP65 rated but for added protection we recommend to position within a cabinet.

WALLACE STONE	Project : Corran Ferry	
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Output

Outfalls

For invert level of pipe at each outfall location, refer to 'drainage schedule' included within calculations.

Outfall pipes to have concrete surround as they extend through rock armoured revetments.

Non-return valves shall be installed on the downstream side of the final manholes of each network. Tideflex checkmate in-line check valve or similar approved.

Network A

Outfall pipe Ø = 350 mm

∴ specify S40 headwall from Marshalls which can accomodate pipes up to 375mm Ø.

Network B

Outfall pipe Ø = 500 mm

∴ specify S60 headwall from Marshalls which can accomodate pipes up to 600 mm Ø

Headwalls

Marshalls precast concrete headwall system is designed to connect pipe work discharging into open water courses.

A cost-effective alternative to in-situ structures, as well as outlet points from ponds and swales, precast headwalls control erosion and scour resulting from excessive velocities and turbulence, helping prevent adjacent soil from sloughing into the watercourse.

As with all concrete products, the headwalls will weather and natural coverage helps them blend into their environment.

Concrete headwalls can be pre-fitted with Hydro-Brakes®, Penstocks and non-return flap valves depending upon application. Please ask us about our time saving solutions for your headwall requirements.

Features

- Erosion control options suited to your requirements
- Greatly reduced installation time and cost - no on-site shuttering or formwork required
- Low maintenance, secure solution

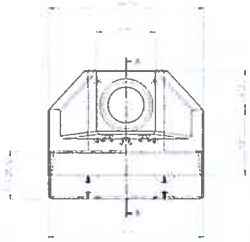
Technical data

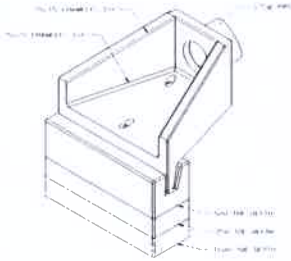
Hole sizes

Designed pipe diam. (mm)	Minimum hole size (mm)	Stock	Made to order
100	130	S20	
150	198	S20, S40*, S60*, S90	
225	320		
300	460	S40*, S60*, S90	
375	540		
450	635	S90	S60
525	720		
600	825		
675	870		S90
750	950		
825	1035		
900	1135		

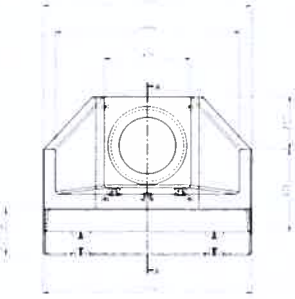
Headwall sizes	Pipe diameters (mm)
S20	Up to 225
S40	Up to 375
S60	Up to 600
S90	Up to 900

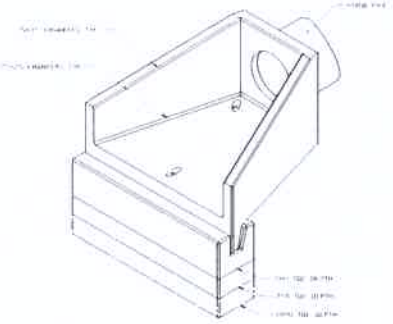
Spillway Headwall S40



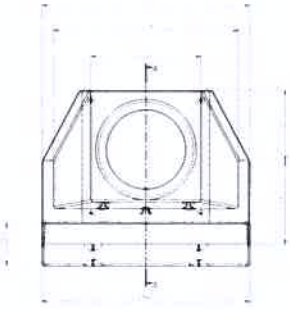


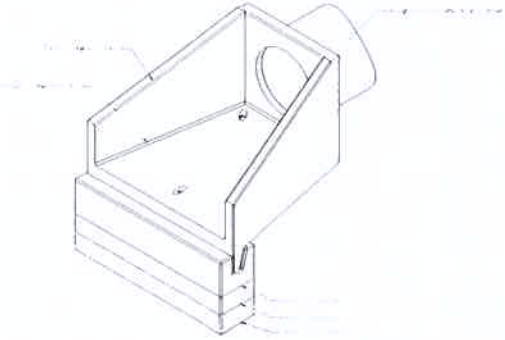
Spillway Headwall S60





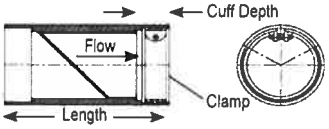
Spillway Headwall S90



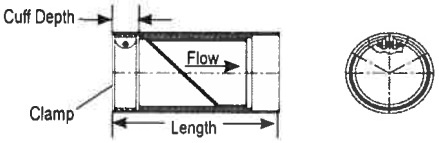


Configurations and Custom Designs

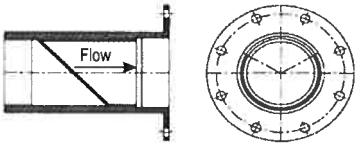
Downstream Clamp



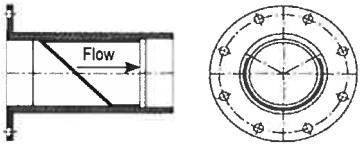
Upstream Clamp



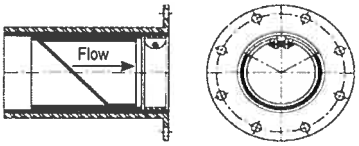
Downstream Flanged



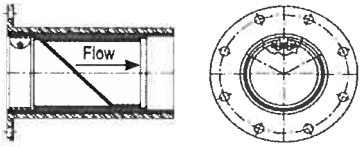
Upstream Flanged



Downstream Flanged Thimble Insert or Extension



Upstream Flanged Thimble Insert or Extension



CheckMate® can be made for any pipe I.D.
Built to fit in sizes from 3-72" (75-1800mm).

Flange shape and bolt pattern can be customized.
Flangeless thimble inserts are available.

	DIMENSIONS											
	NOMINAL PIPE SIZE I.D.		OVERALL LENGTH*		NUMBER OF CLAMPS	CUFF DEPTH		BACK PRESSURE RATING**		WEIGHT***	
	Inches	Millimeters	Inches	Millimeters		Inches	Millimeters	Feet	Meters	lbs	Kg
Low Pressure	3	75	5.1	130	1	1.5	38	5	1.5	0.7	0.3
	4	100	7.9	201	1	1.5	38	5	1.5	1.5	0.7
Standard Pressure	4	100	7.9	201	1	1.5	38	85	26.0	3	1.5
	5	125	9.5	241	1	1.5	38	83	25.3	4	2
	6	150	11.0	279	1	2.0	51	83	25.3	9	4
	7	175	12.8	325	1	2.0	51	79	24.1	11	5
	8	200	15.2	386	1	2.0	51	79	24.1	13	6
	9	225	15.4	391	1	2.0	51	75	22.9	17	8
	10	250	16.1	409	1	2.0	51	71	21.6	20	10
	12	300	19.8	503	1	2.0	51	68	20.1	37	17
	14	* 350 A	25.8	655	1	4.0	102	64	20.0	110	50
	15	381	25.8	655	1	4.0	102	62	18.9	120	55
	16	400	28.6	726	1	4.0	102	60	18.3	133	52
	18	450	31.0	787	1	4.0	102	56	17.1	143	65
	20	* 500 B	42.1	1069	2	8.0	203	53	16.2	223	102
	24	600	47.5	1207	2	8.0	203	45	13.7	304	137
	26	650	50.0	1270	2	8.0	203	42	12.8	370	168
	28	700	52.0	1321	2	8.0	203	40	12.2	434	197
	30	750	54.9	1395	2	8.0	203	38	11.6	500	227
	36	900	62.3	1582	2	8.0	203	30	9.1	828	376
	42	1050	70.6	1793	2	8.0	203	26	7.9	1423	646
	48	1200	79.0	2007	2	8.0	203	23	7.0	1801	817
	54	1350	86.4	2195	2	8.0	203	17	5.2	2700	1225
	60	1500	96.8	2459	2	9.0	229	15	4.6	3315	1504
	72	1800	119.0	3023	3	12.0	305	13	4.0	6100	2767

*Shorter lengths available.

**Back pressure measured from pipe invert.
Higher back pressure ratings available. Consult factory.

***Weights are approximate and do not include crating.

WALLACE STONE	Project : Corran Ferry	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Nether Lochaber Drainage	Date : 21/10/24	Checked :
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Output

Drainage Summary

× Kerb Drains

- Marshalls Beany Block - Base 205 units
- Access points every 50 + Silt traps every 100m

× Filter Drains

- 225mm Ø pipe for full length. (perforated plastic)
- 7 no. outfall points along system
- Type B filter material
- Pipe invert = 600mm

× Gullies

- 10 No. Marshalls precast gully pots
- Insitu brickwork riser to reach carriageway level.

× Channel Drain

- Required at head of slipway
- Marshalls Birco 200 15/0

× Threshold Drains

- Required at door locations of toilet facilities
- ACO threshold drain system.

WALLACE STONE	Project : Corran Ferry	
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Output

Drainage Summary - Continued

× Carrier pipe network

- UPVC pipes between standard manholes and drainage system components

× Separator

- 2 No. separators
  - A = P1SO 1C/SC
  - B = P1.00 1C/SC

× Outfall

- 2 No. precast concrete headwalls from Marshalls
  - A = S40
  - B = S60

× Non-return valves

- Non-return valves to be installed after the final manholes of each network.
- Tideflex checkmate (or similar approved) to be sized to suit outfall pipe diameter

Calculation Cover Sheet

Wallace Stone

				No. of Sheets	
Project Title	Corran Ferry Redevelopment		**Project No.** 2387	**File No.**	
Section	AG Drainage	**Subject**	Drainage	**Calc No.**	C110
Project Manager	Tom Rea	**Design Phase**	A Concept or preliminary ☐ B Analysis and Detailed design X		
Designer	Jamie Arnott		C Design verification ☐ D Other (specify) ☐		

Computer Applications Used

Title	**Version/Date**
ACO QuAD Hydraulic Design	2.0
AutoCAD	2024
Excel	

Scopes of Checking for Manual and Computer-Generated Calculations

Calculation Review

Sheets Checked	**Calculations by**			**Checked By**		
	Name	**Signature**	**Date**	**Name**	**Signature**	**Date**
01 - 26	Jamie Arnott	JA	14/10/24	ALEX SCOTT	ALEX SCOTT	03/12/2024.

a) Basic Design Information or Source and Reference:

HR Wallingford & Barr, Table for the hydraulic design of pipes, sewers, and channels
Marshalls Linear Drainage Design Guide
SPEL Separator Brochure
Marshalls Water Management Drainage Solutions 2023
The Highland Council Roads and Transport Guidelines for New Developments 2013
The Highland Council – Flood Risk and Drainage Impact Assessment
SEPA – Climate Change Allowances for Flood Risk Assessment in Land Use Planning v3

b) Identify documents/technical records where output will be used:

Drawings
Contract Documents

Approved by

Project Manager **Signature** **Date**

Distribution

Original to project file

WALLACE STONE	Project : Corran Ferry	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Ardgour Drainage	Date : 09/10/24	Checked :
	Page No.: 1 of	

Output

Introduction

A drainage system design is required to deal with surface water run-off on the Ardgour side of the Corran ferry crossing.

The proposed system will be formed by the following:

* Channel drains at entrance to pier and at head of slipway
* Gullies along carriageway at parking
* Full retention separator
* Precast concrete headwall (outfall location)
* UPVC carrier pipes between the above elements.

Design Parameters

The drainage system will be designed using the following parameters:

* Return period = 1:200 years (see note 1)
* Duration = 5 mins
* Climate change allowance = 46% (see note 2)

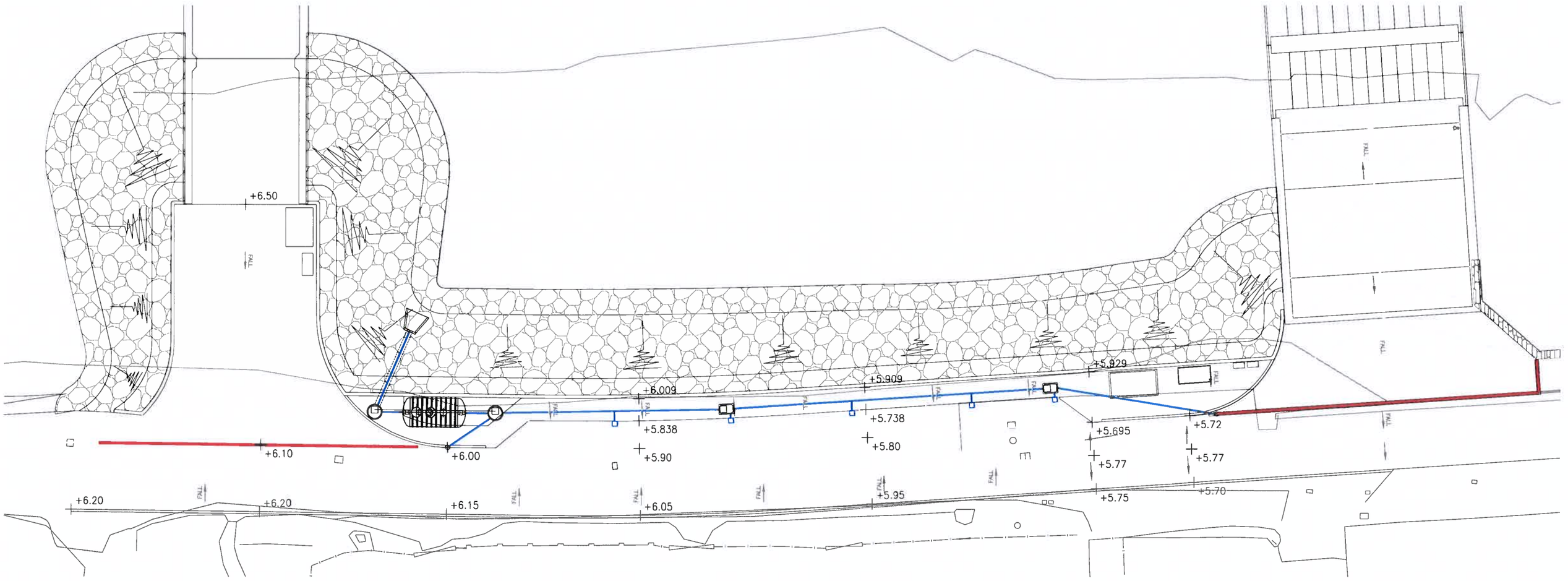
Note 1: Ref 'The Highland council - Flood risk and drainage impact assessment' - Page 14, Section 5.6 - 1:200yr + climate change allowance (note 2).

Note 2: Ref 'SEPA - climate change allowances for flood risk assessment in land use planning V3' - Table 2 → Argyll

Levels

Proposed levels used for drainage design are shown on the markup contained overleaf.

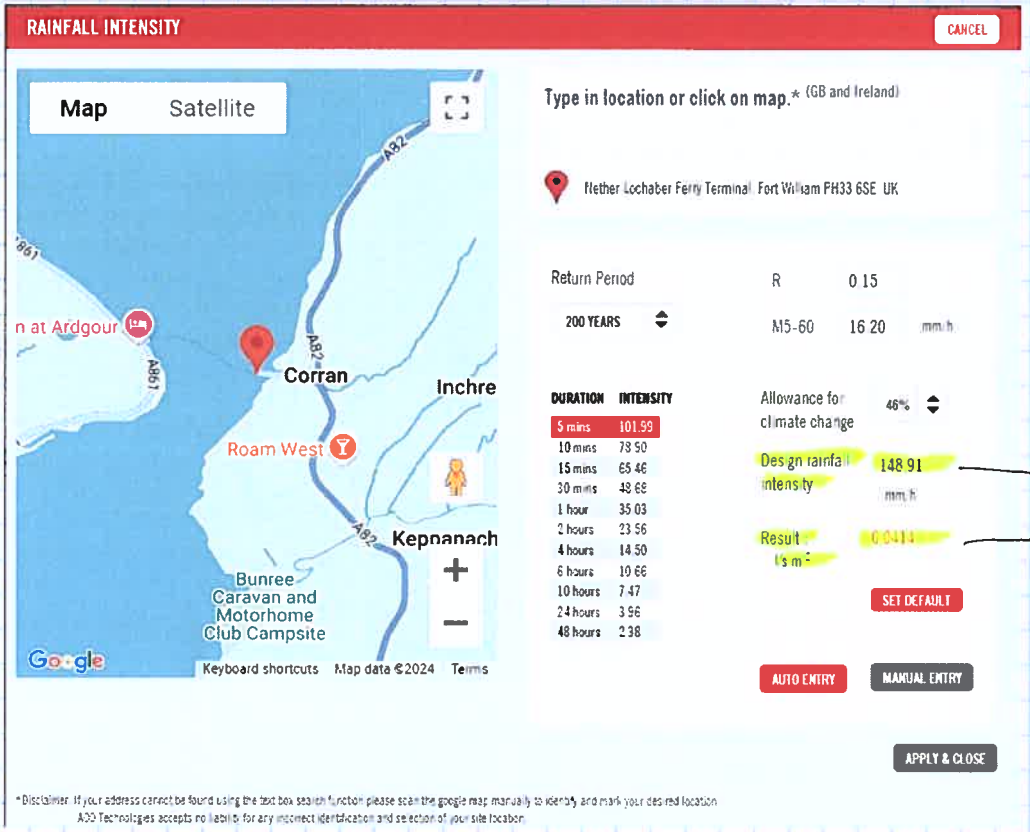
Ardgour - Proposed levels



WALLACE STONE	Project : Corran Ferry	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Ardgour Drainage	Date : 09/10/24	Checked :
	Page No.: 3 of	

Output

ACO Quad 2.0 Rainfall Intensity

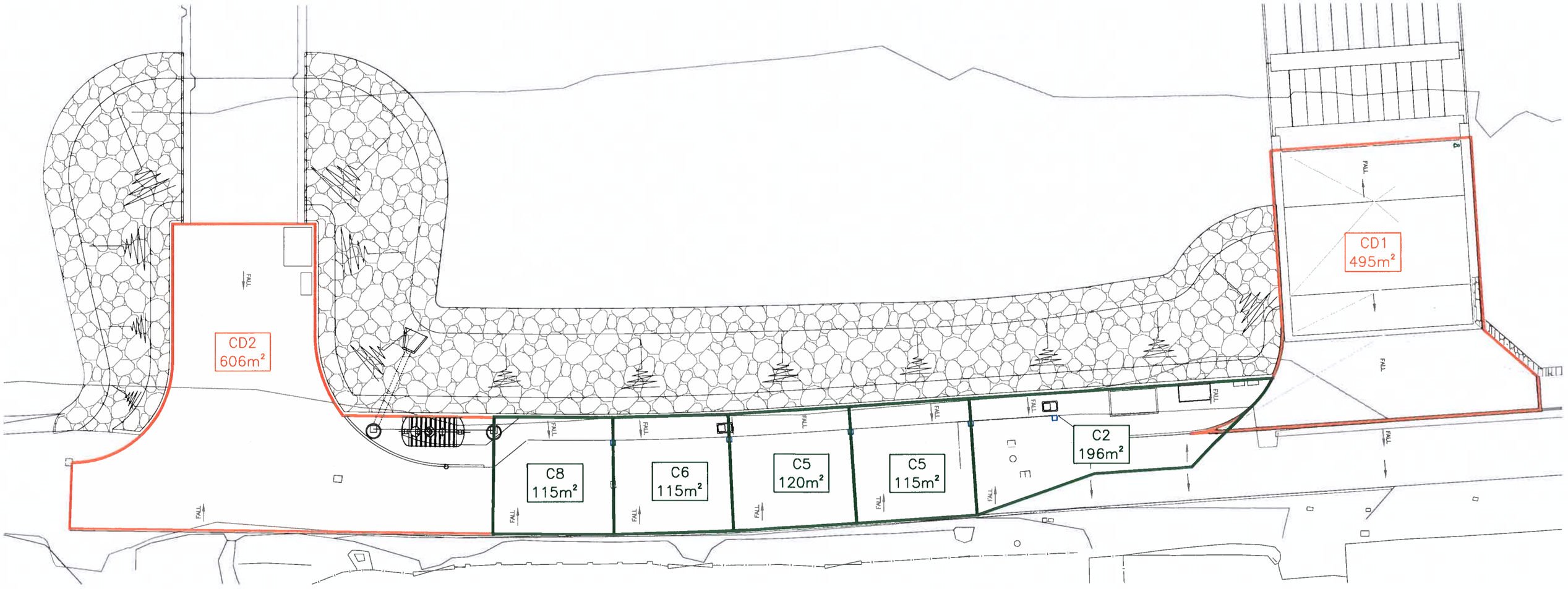


148.91 mm/h

0.0414 l/s/m²

Drainage areas

Drainage areas drawn and measured in AutoCAD. Hand markups included to show key info.


CD1
495m²
CD2
606m²
C8
115m²
C6
115m²
C5
120m²
C5
115m²
C2
196m²
FALL

WALLACE STONE	Project : Corran Ferry	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Ardgour Drainage	Date : 14/10/24	Checked :
	Page No.: 5 of	

Output

Channel Drain Design

Propose channel drains at entrance to new pier and at the head of the new slipway.

At the entrance to the new pier, the channel drain will capture some surface water run-off from the existing road and will prevent any runoff from the pier entrance entering the existing road drainage network.

At the head of the Slipway the channel drain will prevent any run-off from the Slipway entering the existing road drainage network.

Propose using the Birco channel drain range by Marshalls. See attached hydraulic data.

2387 - Ardgour - Channel Drains

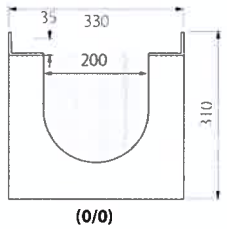
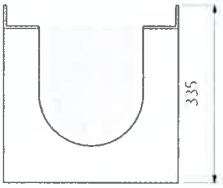
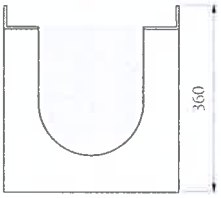
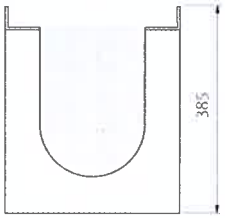
Rainfall Intensity:	148.91 mm/hr
Result:	0.0414 l/s m^{-2}

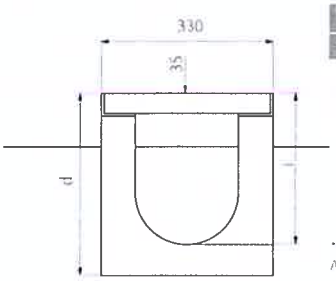
RUN REF	DRAINAGE AREA (m²)	MAX FLOW (l/s)	PROPOSED CHANNEL LENGTH (m)	PROPOSED CHANNEL GRADIENT	PROPOSED CHANNEL DRAIN	DISCHARGE CAPACITY (l/s)	UTILISATION
CD1 (C1)	495	20.48	29	LEVEL	BIRCO 300 - 410	33.9	0.60
CD2 (C9)	606	25.07	38	1 IN 340	BIRCO 200 - 15/0	41.0	0.61
					REF. MARSHALLS LINEAR DRAINAGE DESIGN GUIDE (PRINTOFFS INCLUDED)		

Hydraulic Data

FLOW CAPACITY

CD2

Birco 200 with 0/0 Channel Unit	Birco 200 with 5/0 Channel Unit	Birco 200 with 10/0 Channel Unit	Birco 200 with 15/0 Channel Unit
 (0/0)	 (5/0)*	 (10/0)	 (15/0)*
Equivalent Pipe Diameter (mm) 230	Equivalent Pipe Diameter (mm) 245	Equivalent Pipe Diameter (mm) 260	Equivalent Pipe Diameter (mm) 270



BIRCO 200		
ref.	d	
0/0	310	240
5/0	335	265
10/0	360	290
15/0	385	315

* dimensions at downstream end, deduct 10mm for upstream end
All dimensions measured from grating surface, pavement should be 5mm above this level

The Birco hydraulic data stated in the following tables comprises of flow capacity, in litres per second (l/s) and velocity in metres per second (m/s). This data has been calculated using the Colebrook-White formulae.

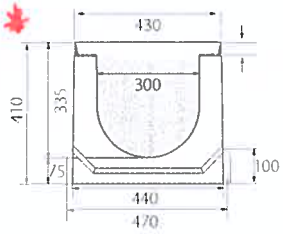
Birco 200								
Channel Type	0/0		5/0		10/0		15/0	
Gradient "1 in"	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s
10	176	4.78	204	4.90	233	4.99	262	5.07
20	124	3.38	144	3.46	165	3.52	185	3.58
30	101	2.76	118	2.82	134	2.87	151	2.92
40	88	2.38	102	2.44	116	2.49	131	2.53
50	78	2.13	91	2.18	104	2.22	117	2.26
75	64	1.74	74	1.78	85	1.81	95	1.84
100	55	1.50	64	1.54	73	1.57	82	1.59
150	45	1.22	52	1.25	60	1.28	67	1.30
200	39	1.06	45	1.08	52	1.10	58	1.12
300	32	0.86	37	0.88	42	0.90	47	0.91
400	27	0.74	32	0.76	36	0.78	41	0.79
500	24	0.66	28	0.68	32	0.69	36	0.70
750	20	0.54	23	0.55	26	0.56	30	0.57
1000	17	0.47	20	0.48	23	0.49	26	0.49
1500	14	0.38	16	0.39	18	0.40	21	0.40
2000	12	0.33	14	0.33	16	0.34	18	0.35

CD2 - gradient = 1/340 (conservatively take 1/400 flow data)

Hydraulic Data

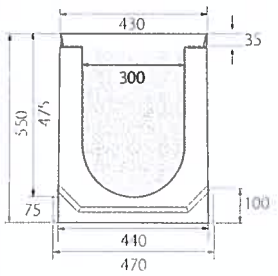
FLOW CAPACITY

Birco 300$_{dc}$



410mm Deep Channel

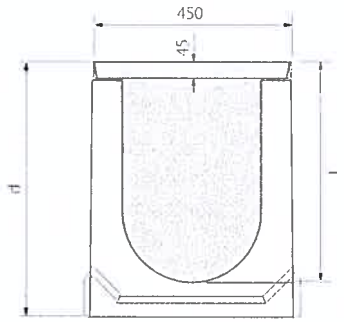
Equivalent Pipe Diameter 350mm



550mm Deep Channel

Equivalent Pipe Diameter 400mm

Birco 300$_{dc}$



ref.	d	i
DR3805000	410	335
DR3805200	550	475

All dimensions are measured from the grating surface, pavement should be 5mm above this level.

Birco 300

Channel Type Gradient '1 in'	410 l/s	410 m/s	550 l/s	550 m/s
10	493.58	6.16	806.34	6.6
20	348.66	4.35	569.63	4.66
30	284.46	3.55	464.77	3.81
40	246.19	3.07	402.26	3.29
50	220.08	2.75	359.6	2.94
75	179.48	2.24	293.28	2.4
100	155.28	1.94	253.75	2.08
150	126.57	1.58	206.87	1.69
200	109.46	1.37	178.92	1.46
300	89.17	1.11	145.77	1.19
400	77.08	0.96	126.02	1.03
500	68.82	0.86	112.54	0.92
750	56	0.7	91.58	0.75
1000	48.36	0.6	79.1	0.65
1500	39.3	0.49	64.3	0.53
2000	33.9	0.42	55.48	0.45

CD 1 - gradient = level

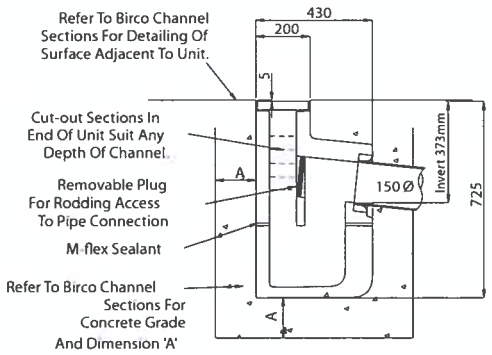
Component Codes

Gratings	Loading	Length (mm)	Width (mm)	Depth (mm)	Unit Weight (kg)	Item Code
20mm Slotted Cast Iron	E600	500	417	45	20.20	DR390620
20mm Slotted Cast Iron	F900	500	417	45	24.7	DR390630

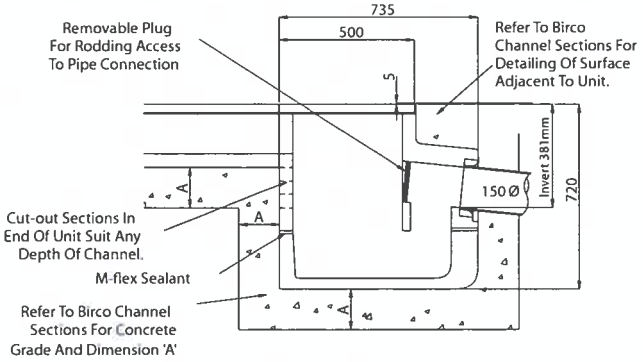
Base Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
Channel 0/0	1000	430	300	410	350	226	DR380500
Channel 5/0	1000	430	300	550	430	228	DR380520

Channel Accessories	Unit Weight (kg)	Item Code
300 AS End Cap	2.5	DR395530
300 AS Cap Outlet	3	DR395540
300$_{dc}$ Outfall	220	DR393560

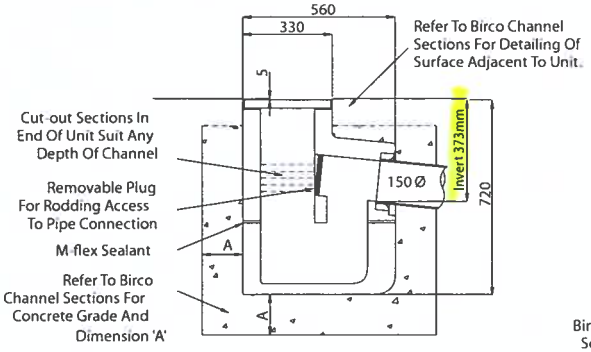
Birco 300 with reference numbers indicated in **bold** black are available ex-stock. Birco 300 with reference numbers indicated in light are manufactured to order. Contact our sales office to discuss your requirements.



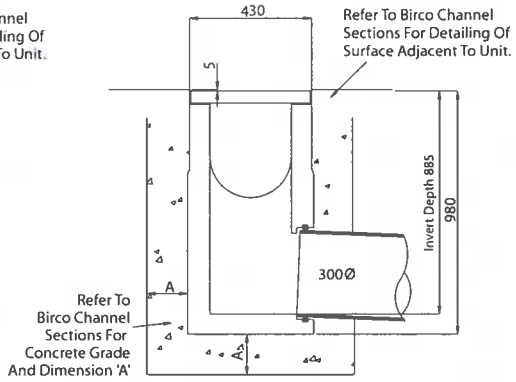
Birco 100 - Inline Side Outfall
(Unit Is 500mm Long)



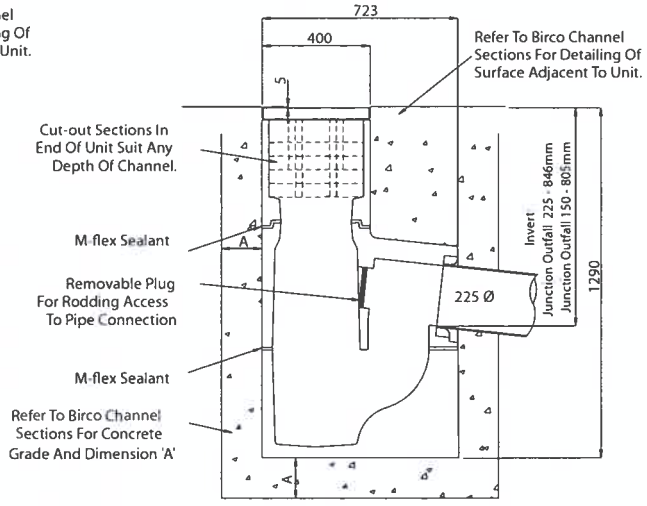
Birco 150 - Inline End Outfall
(Unit Is 250mm Wide)



Birco 200 - Inline Side Outfall
(Unit Is 500mm Long)



Birco 300$_{AS}$ Outfall
(Unit Is 500mm Long)



Birco Junction Outfall 150/225
(Unit Is 400mm Long)

Birco 100, 150, 200 & 300$_{AS}$ Outfall Details

Note: All Invert & Overall Depths Are Measured From Carriageway Surface

WALLACE STONE	Project : Corran Ferry	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Ardgour Drainage	Date : 14/10/24	Checked :
	Page No.: 9 of	

Output

Gullies

Propose gullies along the kerb line at the roadside parking area to take surface water runoff from road and footways

The Highland Council - 'Roads and transport guidelines for new developments' provides guidance for gully spacings along carriageways.

Most of the road will have a crossfall opposed to a camber. Longitudinal gradient will be less than 1/150. Carriageway width = 6m

∴ guidance recommends gullies @ 10m centres

=> 5 gullies proposed along road edge.

Guidance also recommends limiting catchment area to less than 200 m^2 for irregularly shaped areas

Propose Marshalls precast gully pots, with insitu brickwork riser to reach carriageway level.

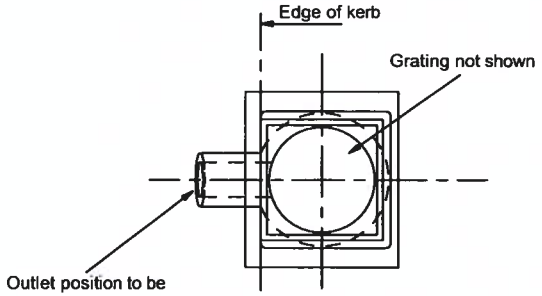
2387 - Ardgour - Gullies

Rainfall Intensity:	148.91 mm/hr
Result:	**0.0414 l/s m^{-2}**

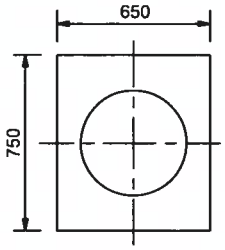
RUN REF	AREA (m^2)	MAX FLOW (l/s)
C2 (gully)	196	**8.11**
C4 (gully)	115	**4.76**
C5 (gully)	120	**4.96**
C6 (gully)	115	**4.76**
C8 (gully)	115	**4.76**

MAX AREA = 200m^2
REF. THE HIGHLAND COUNCIL ROADS AND TRANSPORT GUIDELINES FOR NEW DEVELOPMENTS 5.25.3.4

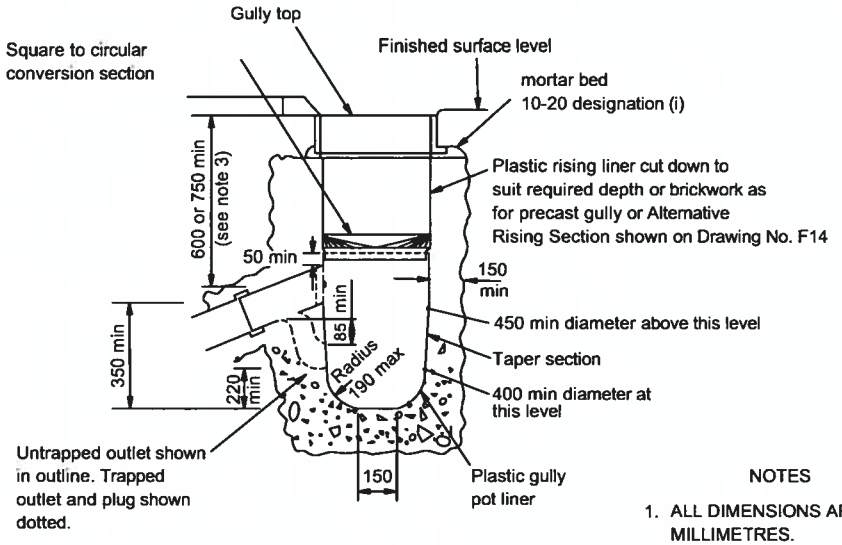
Downloaded from https://www.standardsforhighways.co.uk on 02-Feb-2024, F Series, published: May-2006



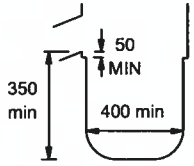
PLAN



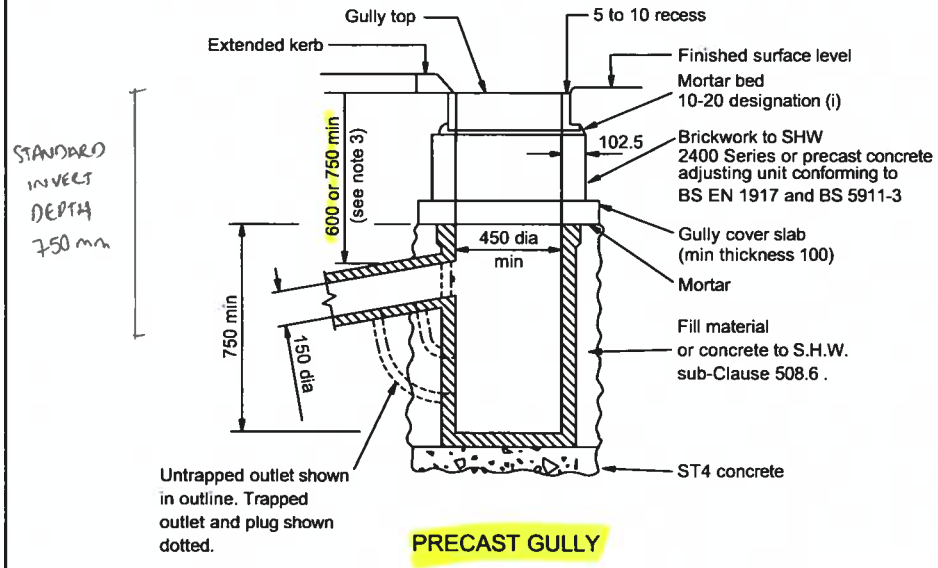
GULLY COVER SLAB



IN-SITU CAST GULLY



ALTERNATIVE IN-SITU CAST SUMP (PARALLEL SIDES)



PRECAST GULLY

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. For details of gully top, see Appendix 5/1.
3. The minimum depth from the top of the grating to the top of the gully outlet is to be 750 when the connecting pipe is under a carriageway or a hard shoulder and 600 elsewhere.
4. Precast concrete gullies and cover slabs shall be to BS 5911-6.
5. When an in-situ cast gully has a trap, the stoppers shall comply with the requirements of BS 5911-4 and BS EN 1917.
6. Alternative rising section shown on Drawing No. F14 may be used.
7. All ST concrete shall be to SHW, Clause 2602.

HIGHWAY CONSTRUCTION DETAILS	DRAINAGE	Issue	Date	PRECAST AND IN-SITU CAST GULLIES	Drawing No.
		E	MAY 06		F13
		D	MAY 05		
		C	NOV 03		
		B	MAR 98		
		A	DEC 91		

WALLACE STONE	Project : Corran Ferry	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Ardgour Drainage	Date : 14/10/24	Checked :
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Output

Carrier Pipe Design

Propose carrier pipe network across site

See overleaf for layout - cover levels are included and have been calculated based the proposed level markup.

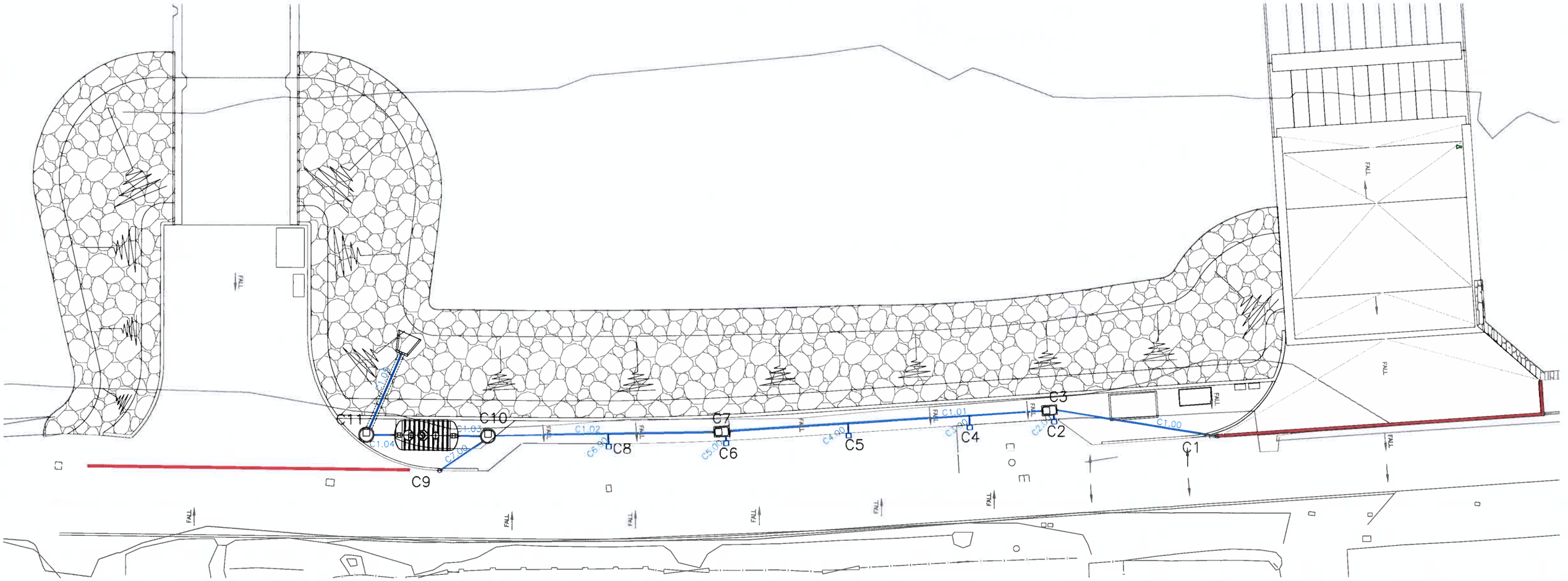
Pipework selection

The pipework has been sized based on the flow requirement and proposed gradient.

Refer to 'Table for hydraulic design of pipes, sewers and channels, 7th ED, HR Wallingford'.

Assume UPVC standard pipework, with spigot and socket joints, 'O' ring seals at 6-9m intervals.

Minimum fall limited to 1 in 100.


C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C1.00
C1.01
C1.02
C1.03
C1.04
C1.05
C2.00
C3.00
C4.00
C5.00
C6.00
C7.00
FALL

2387 - Ardgour - Carrier Pipes

RUN REF	CONTRIBUTIONS TO FLOW	TOTAL FLOW (l/s)	INVERT LEVEL AT START OF RUN (mCD)	INVERT LEVEL AT END OF RUN (mCD)	PIPE LENGTH (m)	START & END INVERT HEIGHT DIFFERENCE (m)	PIPE GRADIENT	REQUIRED PIPE DIAMETER	DISCHARGE CAPACITY (l/s)	UTILISATION
C1.00	CD1 (C1)	20.48	5.347	4.855	14.748	0.492	1 IN 30	150	40.877	0.50
C2.00	C2 (gully)	8.11	4.816	4.768	0.485	0.048	1 IN 10	150	73.701	0.11
C3.00	C4 (gully)	4.76	4.894	4.677	0.841	0.217	1 IN 4	150	73.701	0.06
C4.00	C5 (gully)	4.96	4.994	4.569	0.680	0.425	1 IN 2	150	73.701	0.07
C1.01	C1.00 + C2.00 + C3.00 + C4.00	38.30	4.743	4.461	28.180	0.282	1 IN 100	225	64.781	0.59
C5.00	C6 (gully)	4.76	5.424	5.378	0.460	0.046	1 IN 10	150	73.701	0.06
C6.00	C8 (gully)	4.76	5.100	4.341	0.899	0.759	1 IN 1	150	73.701	0.06
C1.02	C1.01 + C5.00 + C6.00	47.82	4.436	4.239	19.658	0.197	1 IN 100	225	64.781	0.74
C7.00	CD2 (C9)	25.07	5.627	5.154	4.733	0.473	1 IN 10	150	73.701	0.34
C1.03	C1.02 + C7.00	72.88	4.214	4.193	2.150	0.021	1 IN 100	300	138.210	0.53
C1.04	C1.03	72.88	4.093	4.073	2.000	0.020	1 IN 100	300	138.210	0.53
C1.05	C1.04	72.88	4.048	3.974	7.400	0.074	1 IN 100	300	138.210	0.53

↑
measured in AutoCAD

A15

(p.3 of 4)

k_s = 0·060 mm
S = 0·00400 to 0·02000

ie hydraulic gradient =
1 in 250 to 1 in 50

Water (or sewage) at 15°C;
full bore conditions.

velocities in ms^{-1}
discharges in litres/sec

Gradient	(Equivalent) Pipe diameters in mm													
	150	200	225	250	275	300	350	375	400	450	500	525	600	630
0·00400	0·770	0·929	1·003	1·074	1·142	1·207	1·332	1·392	1·450	1·562	1·669	1·721	1·870	1·928
1/ 250	13·599	29·196	39·889	52·717	67·823	85·345	128·17	153·72	182·20	248·39	327·66	372·46	523·81	601·01
0·00420	0·790	0·954	1·030	1·102	1·172	1·239	1·367	1·428	1·488	1·602	1·712	1·765	1·919	1·978
1/ 238	13·961	29·967	40·940	54·102	69·600	87·573	131·51	157·73	186·94	254·84	336·14	382·10	537·47	616·51
0·00440	0·810	0·978	1·055	1·130	1·201	1·270	1·401	1·463	1·524	1·642	1·754	1·809	1·966	2·026
1/ 227	14·314	30·720	41·966	55·455	71·339	89·760	134·78	161·64	191·57	261·14	344·44	391·52	550·80	631·65
0·00460	0·830	1·001	1·081	1·157	1·230	1·300	1·434	1·498	1·561	1·681	1·796	1·851	2·012	2·074
1/ 217	14·660	31·457	42·970	56·779	73·037	91·894	137·97	165·46	196·10	267·30	352·55	400·73	563·95	646·47
0·00480	0·849	1·024	1·105	1·183	1·258	1·330	1·467	1·532	1·596	1·719	1·836	1·893	2·057	2·120
1/ 208	14·993	32·179	43·953	58·075	74·701	93·984	141·10	169·21	200·53	273·33	360·48	409·74	576·62	660·97
0·00500	0·868	1·047	1·130	1·209	1·285	1·359	1·498	1·565	1·630	1·756	1·876	1·934	2·101	2·166
1/ 200	15·330	32·886	44·917	59·345	76·332	96·032	144·15	172·93	204·88	279·24	368·26	418·59	589·13	675·17
0·00550	0·913	1·101	1·188	1·272	1·352	1·429	1·575	1·646	1·714	1·846	1·971	2·032	2·208	2·276
1/ 182	15·933	34·597	47·247	62·417	80·271	100·93	151·57	181·75	215·38	293·52	387·06	439·93	619·36	709·51
0·00600	0·956	1·153	1·244	1·331	1·415	1·496	1·649	1·722	1·794	1·931	2·063	2·127	2·310	2·381
1/ 167	16·902	36·234	49·477	65·355	84·063	105·72	158·65	190·24	225·43	307·18	405·04	460·35	648·23	742·93
0·00650	0·998	1·203	1·298	1·389	1·476	1·560	1·720	1·796	1·871	2·014	2·151	2·217	2·409	2·482
1/ 154	17·640	37·806	51·615	68·177	87·686	110·27	165·47	198·33	235·07	320·37	422·50	479·85	675·51	773·84
0·00700	1·038	1·252	1·350	1·444	1·535	1·622	1·788	1·867	1·945	2·093	2·235	2·304	2·503	2·580
1/ 143	18·361	39·350	53·699	70·935	91·196	114·69	172·04	206·21	244·55	333·32	439·32	498·91	702·74	804·19
0·00750	1·077	1·298	1·400	1·498	1·591	1·682	1·854	1·936	2·016	2·170	2·317	2·388	2·594	2·674
1/ 133	19·082	40·893	55·782	73·692	94·705	119·05	178·58	214·01	253·62	345·91	454·66	517·03	727·63	833·46
0·00800	1·115	1·343	1·449	1·550	1·646	1·740	1·917	2·002	2·085	2·244	2·396	2·470	2·683	2·765
1/ 125	19·794	42·429	57·861	76·431	98·235	123·47	185·17	221·91	262·90	358·72	471·49	536·60	754·43	864·19
0·00850	1·152	1·387	1·496	1·600	1·700	1·796	1·979	2·067	2·152	2·316	2·473	2·549	2·768	2·853
1/ 118	20·452	43·843	59·821	79·035	101·64	127·71	191·51	229·55	271·91	370·95	487·50	554·96	780·24	892·96
0·00900	1·187	1·429	1·541	1·648	1·751	1·850	2·039	2·129	2·217	2·386	2·547	2·625	2·851	2·938
1/ 111	21·077	45·169	61·630	81·440	104·72	131·62	197·34	236·55	280·17	382·31	502·50	572·31	804·25	919·95
0·00950	1·222	1·471	1·586	1·696	1·802	1·904	2·097	2·190	2·280	2·454	2·620	2·700	2·932	3·022
1/ 105	21·690	46·497	63·440	83·844	107·81	135·49	203·13	243·56	288·44	393·72	517·50	589·69	828·87	947·97
0·01000	1·255	1·511	1·629	1·742	1·851	1·955	2·154	2·249	2·342	2·520	2·690	2·773	3·011	3·103
1/ 100	22·283	47·825	65·251	86·248	110·90	139·36	208·92	250·57	296·71	405·13	532·50	606·78	853·50	975·97
0·01100	1·320	1·589	1·713	1·831	1·945	2·055	2·264	2·364	2·461	2·648	2·826	2·913	3·163	3·259
1/ 91	23·432	50·278	68·610	90·679	116·61	146·52	219·67	263·49	312·04	425·98	559·99	638·24	897·78	1026·0
0·01200	1·383	1·663	1·793	1·917	2·036	2·151	2·369	2·473	2·575	2·770	2·957	3·047	3·308	3·409
1/ 83	24·539	52·653	71·857	94·952	122·10	153·42	230·01	275·87	326·72	445·93	586·21	668·14	939·94	1074·0
0·01300	1·442	1·735	1·870	1·999	2·123	2·242	2·469	2·578	2·684	2·887	3·082	3·176	3·448	3·552
1/ 77	25·596	54·936	74·945	99·044	127·36	160·00	239·79	287·64	340·54	464·80	611·04	696·58	979·74	1119·6
0·01400	1·500	1·803	1·944	2·078	2·206	2·330	2·566	2·679	2·789	3·000	3·202	3·300	3·582	3·690
1/ 71	26·609	57·088	77·891	102·93	132·36	166·28	249·19	298·89	353·94	482·97	634·97	723·87	1017·9	1163·6
0·01500	1·555	1·870	2·015	2·154	2·287	2·415	2·660	2·777	2·890	3·109	3·318	3·419	3·711	3·824
1/ 67	27·574	59·192	80·719	106·67	137·14	172·34	258·31	309·82	366·92	500·72	658·26	750·14	1055·0	1206·0
0·01600	1·609	1·934	2·084	2·228	2·365	2·498	2·750	2·871	2·988	3·214	3·430	3·535	3·837	3·953
1/ 63	28·534	60·761	82·868	109·54	140·78	176·95	265·21	318·09	376·62	514·21	676·30	770·77	1084·7	1240·2
0·01700	1·661	1·996	2·151	2·299	2·441	2·578	2·838	2·962	3·083	3·316	3·539	3·647	3·958	4·078
1/ 59	29·456	62·719	85·530	113·05	145·28	182·61	273·75	328·19	388·68	530·56	697·99	795·49	1119·1	1279·2
0·01800	1·712	2·057	2·216	2·368	2·515	2·655	2·923	3·051	3·176	3·416	3·645	3·756	4·076	4·199
1/ 56	30·351	64·620	88·119	116·46	149·65	188·10	282·06	338·08	400·39	546·54	719·03	819·74	1153·4	1318·0
0·01900	1·761	2·116	2·280	2·436	2·586	2·731	3·006	3·138	3·266	3·512	3·748	3·862	4·191	4·317
1/ 53	31·222	66·471	90·636	119·78	153·91	193·43	290·03	347·76	411·99	562·49	740·03	843·39	1186·9	1356·9
0·02000	1·809	2·173	2·341	2·502	2·656	2·804	3·087	3·222	3·353	3·606	3·848	3·965	4·302	4·433
1/ 50	31·971	68·274	93·093	122·91	157·75	198·23	297·00	356·86	421·29	573·55	755·50	858·26	1216·5	1391·7
	110	140	160	180	190	210	250	260	280	320	350	370	420	440

θ_{medial} **for part-full circular pipes.**

k_s = 0·060 mm S = 0·00400 to 0·02000

k_s = 0·060 mm
S = 0·02000 to 0·10000

ie hydraulic gradient =
1 in 50 to 1 in 10

Water (or sewage) at 15°C;
full bore conditions.

velocities in ms^{-1}
discharges in litres/sec

Gradient	(Equivalent) Pipe diameters in mm													
	150	200	225	250	275	300	350	375	400	450	500	525	600	630
0·02000	1·809	2·173	2·341	2·502	2·656	2·804	3·087	3·222	3·353	3·606	3·848	3·965	4·302	4·433
1/ 50	31·971	68·274	93·090	122·81	157·75	198·23	297·00	355·86	421·39	573·55	755·50	858·26	1216·5	1381·7
0·02200	1·902	2·284	2·460	2·629	2·790	2·946	3·243	3·384	3·522	3·788	4·041	4·164	4·518	4·654
1/ 45·5	33·609	71·763	97·822	129·04	165·74	208·26	311·99	373·80	442·62	602·39	793·44	901·33	1277·4	1450·9
0·02400	1·991	2·390	2·574	2·750	2·919	3·082	3·392	3·540	3·684	3·961	4·226	4·354	4·724	4·867
1/ 41·7	35·176	75·078	102·35	135·00	173·38	217·85	326·32	390·95	462·91	629·95	829·70	942·50	1335·7	1517·0
0·02600	2·076	2·491	2·683	2·867	3·043	3·212	3·535	3·689	3·839	4·127	4·403	4·536	4·922	5·070
1/ 38·5	36·679	78·270	106·69	140·71	180·72	227·05	340·07	407·40	482·37	656·40	864·48	981·99	1391·5	1580·5
0·02800	2·158	2·589	2·788	2·979	3·161	3·337	3·672	3·832	3·988	4·287	4·573	4·712	5·112	5·266
1/ 35·7	38·127	81·343	110·87	146·22	187·77	235·90	353·30	423·24	501·11	681·86	897·97	1020·0	1445·3	1641·5
0·03000	2·237	2·684	2·890	3·087	3·276	3·458	3·805	3·970	4·132	4·442	4·738	4·881	5·295	5·455
1/ 33·3	39·524	84·309	114·90	151·53	194·58	244·45	366·07	438·53	519·19	706·43	930·28	1056·7	1497·2	1700·4
0·03200	2·313	2·775	2·988	3·192	3·387	3·575	3·933	4·104	4·271	4·591	4·897	5·045	5·473	5·638
1/ 31·3	40·877	87·179	118·81	156·67	201·18	252·72	378·43	453·32	536·68	730·19	961·54	1092·2	1547·4	1757·4
0·03400	2·387	2·864	3·083	3·293	3·495	3·689	4·058	4·234	4·406	4·736	5·051	5·204	5·645	5·815
1/ 29·4	42·183	89·962	122·50	161·65	207·58	260·74	390·41	467·65	553·54	753·23	991·84	1126·6	1596·1	1812·6
0·03600	2·459	2·950	3·176	3·392	3·599	3·799	4·179	4·360	4·537	4·877	5·201	5·358	5·812	5·987
1/ 27·8	43·462	92·665	126·27	166·49	213·77	268·52	402·04	481·57	570·11	775·61	1021·3	1160·0	1643·4	1866·3
0·03800	2·530	3·033	3·266	3·488	3·701	3·906	4·296	4·483	4·664	5·014	5·347	5·509	5·975	6·154
1/ 26·3	44·701	95·294	129·83	171·20	219·81	276·10	413·36	495·12	586·13	797·37	1049·9	1192·6	1689·0	1918·5
0·04000	2·598	3·115	3·353	3·581	3·800	4·010	4·411	4·602	4·788	5·147	5·489	5·655	6·133	6·317
1/ 25·0	45·909	97·856	133·33	175·79	225·69	283·48	424·38	508·31	601·74	818·58	1077·8	1224·1	1734·1	1969·3
0·04200	2·665	3·194	3·439	3·672	3·896	4·112	4·523	4·719	4·910	5·277	5·628	5·797	6·288	6·477
1/ 23·8	47·087	100·36	136·78	180·28	231·43	290·67	435·14	521·18	616·90	839·25	1105·0	1255·0	1777·8	2018·9
0·04400	2·730	3·272	3·522	3·761	3·991	4·212	4·632	4·833	5·028	5·404	5·763	5·937	6·439	6·632
1/ 22·7	48·232	102·80	140·05	184·62	237·03	297·70	445·84	533·75	631·83	859·49	1131·5	1285·1	1820·4	2067·3
0·04600	2·793	3·348	3·604	3·848	4·083	4·309	4·739	4·944	5·144	5·528	5·895	6·073	6·586	6·784
1/ 21·7	49·363	105·16	143·20	188·91	242·51	304·66	455·91	546·04	645·37	879·20	1157·5	1314·8	1862·1	2114·6
0·04800	2·856	3·422	3·684	3·934	4·173	4·404	4·843	5·053	5·257	5·650	6·025	6·206	6·730	6·932
1/ 20·8	50·483	107·52	146·47	193·05	247·87	311·30	466·96	559·09	659·59	898·52	1182·8	1343·5	1903·0	2161·6
0·05000	2·917	3·495	3·762	4·017	4·262	4·497	4·945	5·159	5·368	5·769	6·151	6·337	6·872	7·078
1/ 20·0	51·585	109·81	149·61	197·18	253·12	317·83	475·80	569·64	674·52	917·45	1207·6	1371·7	1942·5	2206·2
0·05500	3·064	3·671	3·951	4·219	4·475	4·722	5·193	5·417	5·636	6·056	6·458	6·652	7·213	7·429
1/ 18·2	54·160	115·32	157·15	207·08	265·81	333·81	499·58	598·30	708·18	963·18	1267·6	1440·2	2039·5	2315·9
0·06000	3·205	3·839	4·132	4·411	4·679	4·938	5·429	5·663	5·892	6·331	6·750	6·953	7·540	7·765
1/ 16·7	56·643	120·62	164·28	216·54	277·54	348·63	522·31	625·60	740·34	1006·9	1325·4	1505·2	2131·9	2420·7
0·06500	3·341	4·001	4·305	4·596	4·875	5·144	5·655	5·900	6·137	6·594	7·031	7·242	7·853	8·088
1/ 15·4	59·034	125·65	171·13	225·62	289·07	363·02	544·10	651·65	771·01	1048·9	1380·8	1567·8	2220·3	2521·1
0·07000	3·471	4·156	4·472	4·774	5·064	5·343	5·873	6·127	6·373	6·848	7·301	7·521	8·154	8·398
1/ 14·3	61·356	130·57	177·82	234·35	300·37	377·06	565·09	676·70	800·91	1089·1	1433·6	1628·0	2305·5	2617·9
0·07500	3·597	4·306	4·633	4·946	5·246	5·535	6·084	6·346	6·602	7·093	7·562	7·789	8·445	8·697
1/ 13·3	63·556	135·29	184·23	242·78	311·58	391·20	585·34	700·30	829·57	1128·1	1484·6	1686·1	2387·7	2711·1
0·08000	3·718	4·451	4·789	5·112	5·422	5·720	6·288	6·559	6·822	7·330	7·814	8·049	8·726	8·987
1/ 12·5	65·707	139·84	190·48	250·90	322·03	404·33	604·90	724·37	857·30	1165·7	1534·3	1742·3	2467·2	2801·4
0·08500	3·836	4·592	4·940	5·273	5·592	5·900	6·485	6·764	7·036	7·559	8·058	8·300	8·998	9·267
1/ 11·8	67·791	144·26	196·43	258·84	332·16	417·04	623·92	747·09	884·17	1202·2	1582·3	1796·8	2544·2	2888·8
0·09000	3·951	4·728	5·087	5·429	5·758	6·075	6·676	6·964	7·244	7·782	8·296	8·545	9·263	9·540
1/ 11·1	69·815	148·55	202·26	266·51	342·00	429·38	642·35	769·15	910·26	1237·7	1628·9	1849·7	2619·1	2973·8
0·09500	4·062	4·861	5·230	5·582	5·919	6·244	6·863	7·158	7·446	7·999	8·527	8·782	9·521	9·805
1/ 10·5	71·784	152·72	207·93	273·98	351·57	441·39	660·29	790·61	935·64	1272·1	1674·2	1901·2	2691·9	3056·4
0·10000	4·171	4·991	5·369	5·730	6·076	6·410	7·044	7·348	7·642	8·210	8·752	9·014	9·771	10·06
1/ 10·0	73·701	156·78	213·46	281·26	360·90	453·09	677·76	811·51	960·37	1305·7	1718·4	1951·3	2762·9	3136·9
	180	240	270	300	320	350	410	440	470	550	600	600	700	750

θ_{medial} for part-full circular pipes.

S = 0·02000 to 0·10000 k_s = 0·060 mm

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Output

Typical level changes

To enable flow through the drainage system a nominal 25mm change in invert level between the incoming and outgoing pipes at manhole locations has been assumed.

Where a manhole has more than 1 incoming pipe the invert level of the outgoing pipe is calculated based on the incoming invert level of the lowest pipe.

WALLACE STONE	Project : Corran Ferry	
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Output

Separator

To prevent pollution and contaminants entering the sea, the full site drainage will pass through a separator prior to discharge via the outfall.

Max flow through separator = 72.47 l/s

Propose using SPEL Puraceptor Class 1 full retention Separator - single chamber model P080 1c/sc

UR = $\frac{72.88}{80}$ = 0.91 < 1.0 ∴ acceptable

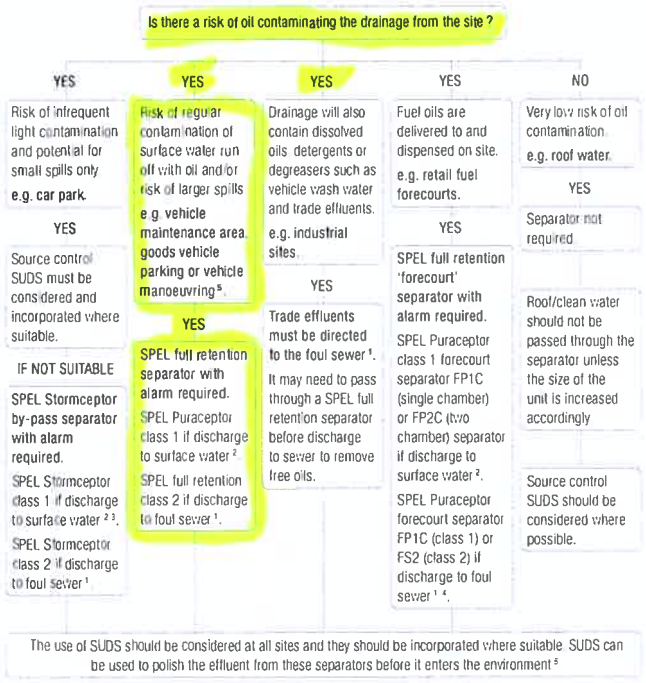
See attached sheets for selection process.

SPEL Separator range overview and how to select

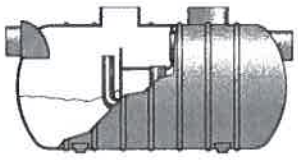
How to select and specify to the Environment Agency's Pollution Prevention Guidelines PPG3

Notes to accompany the flowchart:

1. You must seek prior permission from your local sewer provider before you decide which separator to install and before you make any discharge.
2. You must seek prior permission from the Environment Agency before you decide which separator to install.
3. In this case, if it is considered that there is a low risk of pollution as source control SUDS scheme may be appropriate.
4. In certain circumstances, the sewer provider may require a class 1 separator for discharges to sewer to prevent explosive atmospheres from being generated.
5. Drainage from higher risk areas such as vehicle maintenance yards and goods vehicle parking areas should be connected to foul sewer in preference to surface water.
6. In certain circumstances, a separator may be one of the devices used in the SUDS scheme. Ask the Environment Agency for advice.



SPEL Stormceptor® class 1 by-pass separators



SC – with silt capacity.

Typical sites

Infrequent light contamination – potential for small spills only eg. car parks.

Note: class 2 available if connection to foul sewer.

General description

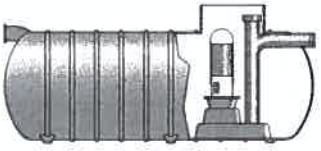
SPEL Stormceptors are the most widely used separators where it is acceptable to treat the 'first flush' ie. flows according to the nominal size (NSB) generated by rainfall rates of up to 6.5mm/hour. This covers most rainfall events in the UK. Any excess rainfall is by-passed without treatment.

Features

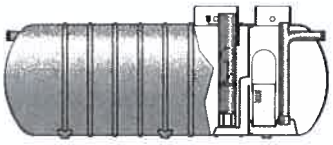
- **Long life efficient coalescer units.**
- **Good access to all parts for desludging.**
- **Nine different inlet/outlet orientations to suit site drainage lay-out.**

The SPEL Stormceptor was the first Environment Agency listed class 1 by-pass separator to BS EN 858-1:2002 (2001)

SPEL Puraceptor® class 1 full retention separators – single and two chamber models



Single chamber models – for full range see page 7



Two chamber models – for full range see page 8

Typical sites single chamber

Fuel storage and handling areas, filling stations, commercial vehicle/plant and contaminated industrial areas.

General description

The SPEL Puraceptor models are designed for high performance and long service life between maintenance periods.

The Puraceptor is available in two versions, single or two chamber, dependent upon the site application and requirements.

An automatic closure device (ACD) is fitted to close off the separator when the contained oil exceeds the maximum oil storage volume.

Features

- **Good access to all parts for desludging.**
- **One access shaft for desludging and servicing of ACD and coalescer unit.**
- **Sized for working capacity PLUS fuel/oil and silt containment, ensuring optimum performance between maintenance periods.**

Typical sites two chamber

High risk fuel storage areas, filling stations, railway fuelling and maintenance depots, fire training grounds etc.

Additional features

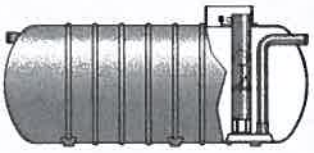
This is the model to cope with heavy levels of pollutants and silt.

The coalescer unit is mounted in the second chamber, providing a coalescence process for the separation of smaller globules of light liquid pollutants before final discharge to the surface water drain.

Being incorporated in the second chamber prevents blockage of the coalescer insert in the event of heavy spillages or heavy silt content in surface water. It can be simply lifted out for cleaning during routine maintenance.

The second access shaft provides easier access for desludging and maintenance of the coalescer.

SPEL full retention class 2 separators



Typical sites

Where risk of regular contamination of surface water run-off with discharge to foul sewer.

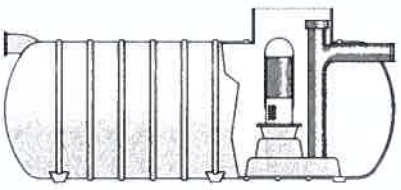
SPEL Puraceptor class 1 full retention separators – Single chamber models

Compliant to the European Standard BS EN 858-1:2002, the Environment Agency's Pollution Prevention Guidelines PPG3 and the Construction Products Regulations

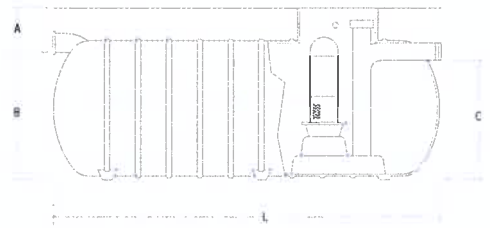
Model	Nominal size (NS) Series	Flow (l/s)	Catchment area (m²)	Oil storage (litres)	Silt capacity (litres)	Overall length* (mm) L	Overall diameter (mm)	Inlet Invert (mm) A	Base to inlet (mm) B	Base to outlet (mm) C	Max in/out pipe diameter (mm)	Number of access shafts (dia. mm) 600	750	900	1200
P004 1C/SC	200	4	222	40	400	1,720	1,225	630	1,110	1,050	160	-	1	-	-
P006 1C/SC	200	6	333	60	600	2,310	1,225	630	1,110	1,050	160	-	1	-	-
P010 1C/SC	200	10	556	100	1,000	3,410	1,225	630	1,110	1,050	160	-	1	-	-
P015 1C/SC	300	15	833	150	1,500	3,200	1,875	350	1,800	1,740	225	-	1	-	-
P020 1C/SC	300	20	1,111	200	2,000	3,540	1,875	350	1,800	1,740	225	1	1	-	-
FP 1C/SC	300	20	1,111	200	2,000	4,290	1,875	350	1,800	1,740	225		1	-	-
P030 1C/SC	300	30	1,667	300	3,000	4,420	1,875	390	1,760	1,700	300	1	-	1	-
P040 1C/SC	300	40	2,222	400	4,000	5,760	1,875	390	1,760	1,700	300	1	-	1	-
P050 1C/SC	300	50	2,778	500	5,000	7,060	1,875	390	1,760	1,700	300	1	-	1	-
P065 1C/SC	400	65	3,611	650	6,500	4,810	2,700	425	2,625	2,525	300	1	-	2	-
P080 1C/SC	400	80	4,444	800	8,000	5,700	2,700	425	2,625	2,525	300	1	-	2	-
P100 1C/SC	400	100	5,555	1,000	10,000	7,400	2,700	475	2,575	2,475	450	1	-	2	-
P125 1C/SC	400	125	6,944	1,250	12,500	8,580	2,700	475	2,575	2,475	450	-	1	2	-
P150 1C/SC	400	150	8,333	1,500	15,000	10,180	2,700	475	2,575	2,475	450	-	1	2	-
P165 1C/SC	400	165	9,166	1,650	16,500	11,200	2,700	500	2,550	2,450	450	2	1	1	-
P200 1C/SC	400	200	11,110	2,000	20,000	13,710	2,700	660	2,390	2,290	600	2	1	1	-
P250/1CSC	400	250	13,888	2,500	25,000	16,750	2,700	660	2,390	2,290	600	2	1	2	-
P280 1C/SC	400	280	15,555	2,800	28,000	18,800	2,700	660	2,390	2,290	600	1	2	2	-
P300 1C/SC	500	300	16,665	3,000	30,000	12,410	3,650	805	3,070	2,970	750	1	2	2	-
P400 1C/SC	500	400	22,220	4,000	40,000	15,760	3,650	805	3,070	2,970	750	2	2	2	-
P500 1C/SC	500	500	27,775	5,000	50,000	20,530	3,650	955	2,920	2,820	900	2	2	1	1
P500 1C/SC	600	500	27,775	5,000	50,000	16,040	4,150	925	3,250	3,150	900	2	2	1	1
P600 1C/SC	600	600	33,330	6,000	60,000	19,080	4,150	925	3,250	3,150	900	2	2	-	2
P700 1C/SC	600	700	38,888	7,000	70,000	21,460	4,150	925	3,250	3,150	900	3	2	3	-
P800 1C/SC	600	800	44,440	8,000	80,000	23,020	4,150	925	3,250	3,150	900	3	2	2	1
P900 1C/SC	600	900	49,846	9,000	90,000	24,658	4,150	925	3,250	3,150	900	3	2	-	3

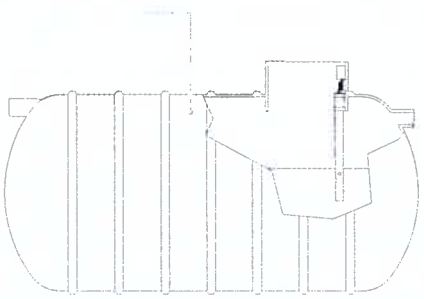
Model FP1C is a special forecourt unit with 7600 litre spillage holding capacity.

*Overall length subject to inlet/outlet size and orientation.



Single chamber models.





Alarm options:

1. SPEL Automatic oil alarm/monitoring system Model ALARM-DY Type 14400. No volt free terminals. Not BMS compatible. Flashing beacon optional extra.
2. SPEL Automatic oil alarm/monitoring system, Model OMS-1. Volt free connection and BMS compatible. Flashing beacon optional extra.
3. SPEL Automatic oil alarm/monitoring system, Model ALARM-1000. Two volt free connections, 300m range and BMS compatible. Flashing beacon optional extra, solar power and multi probe options available.

All alarms are IP65 rated but for added protection we recommend to position within a cabinet.

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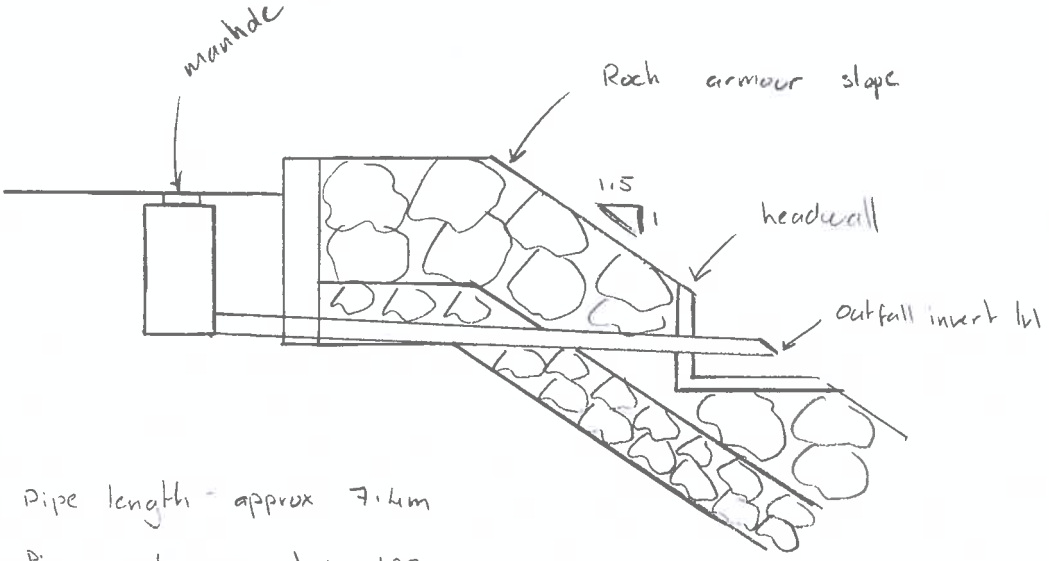
Output

Outfall



Pipe length - approx 7.4m

Pipe gradient = 1 in 100

Note: outfall pipe to have concrete surround as it extends through rock armour slope

Propose installation of non-return valve on the downstream side of the final manhole.

↳ Tideflex Checkmate in-line check valve or similar approved (see overleaf for datasheet.

Outfall pipe = 300 mm Ø

propose Marshalls S40 precast concrete headwall which can accomodate pipes up to 375mm Ø.

Headwalls

Marshalls precast concrete headwall system is designed to connect pipe work discharging into open water courses.

A cost-effective alternative to in-situ structures, as well as outlet points from ponds and swales, precast headwalls control erosion and scour resulting from excessive velocities and turbulence, helping prevent adjacent soil from sloughing into the watercourse.

As with all concrete products, the headwalls will weather and natural coverage helps them blend into their environment.

Concrete headwalls can be pre-fitted with Hydro-Brakes®, Penstocks and non-return flap valves depending upon application. Please ask us about our time saving solutions for your headwall requirements.

Features

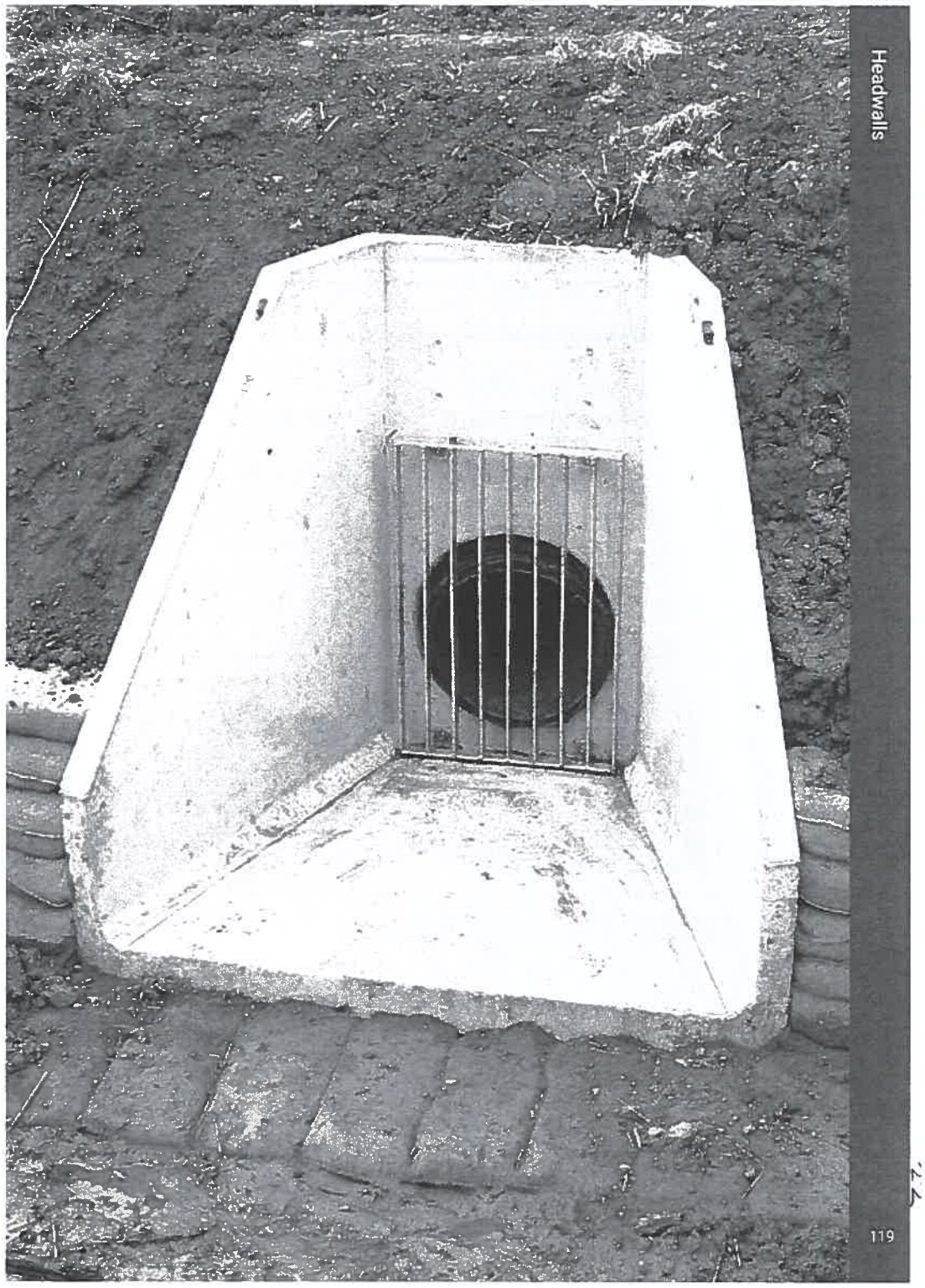
- Erosion control options suited to your requirements
- Greatly reduced installation time and cost - no on-site shuttering or formwork required
- Low maintenance, secure solution

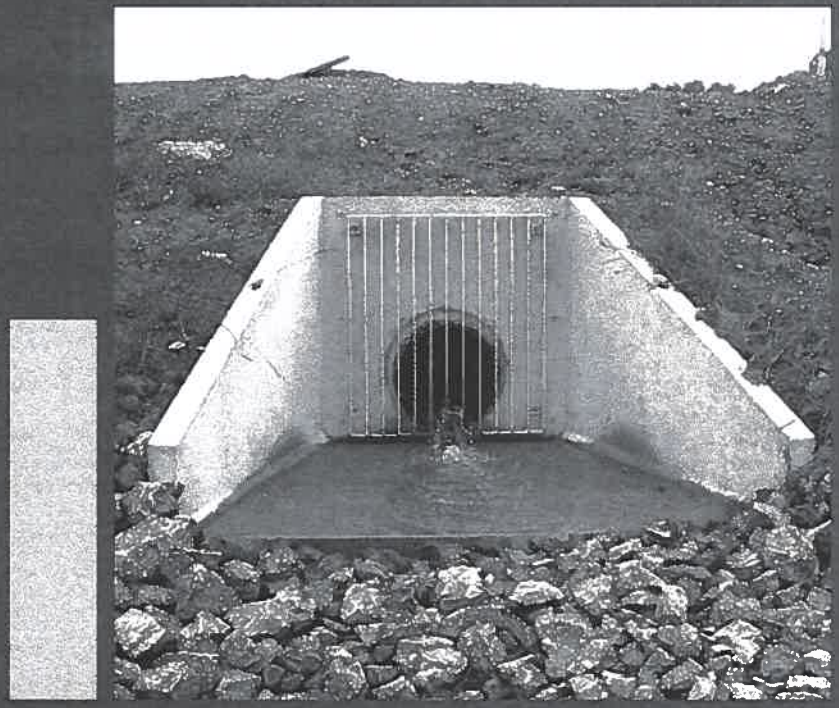
Technical data

Hole sizes

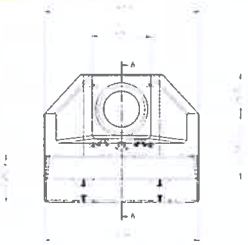
Designed pipe diam. (mm)	Minimum hole size (mm)	Stock	Made to order
100	130	S20	
150	198	S20, S40*, S60*, S90	
225	320		
300	460	S40*, S60*, S90	
375	540		
450	635	S90	S60
525	720		
600	825		
675	870		S90
750	950		
825	1035		
900	1135		

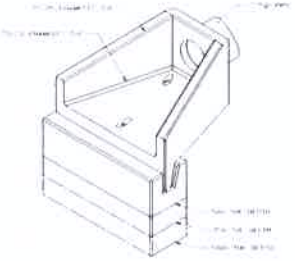
Headwall sizes	Pipe diameters (mm)
S20	Up to 225
S40	Up to 375
S60	Up to 600
S90	Up to 900





Spillway Headwall S40





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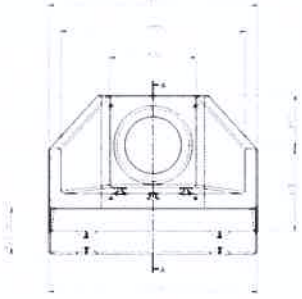
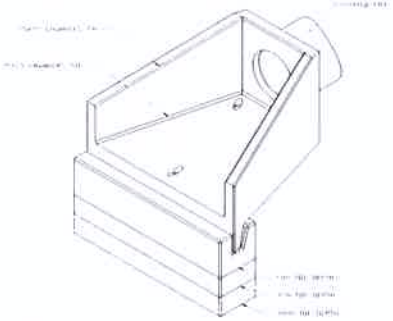
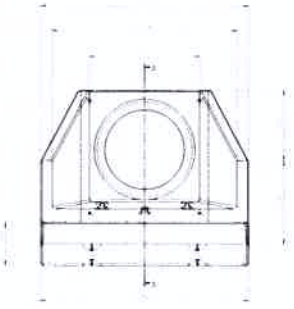
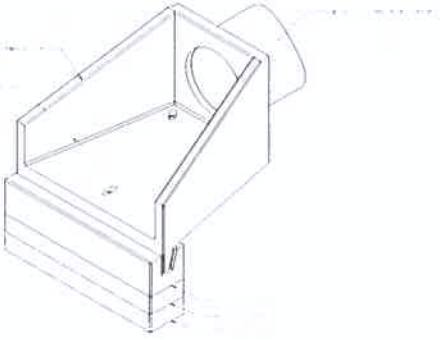




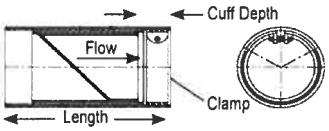
Spillway Headwall S90





Configurations and Custom Designs

Downstream Clamp



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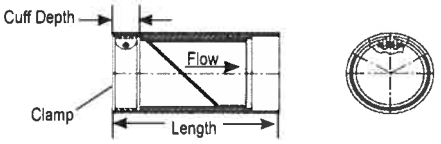
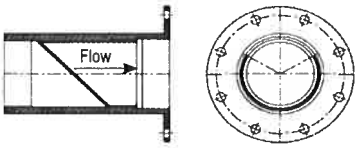
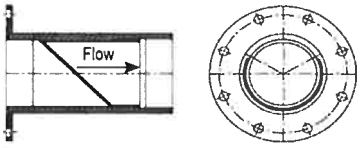


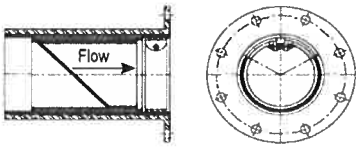
Downstream Flanged



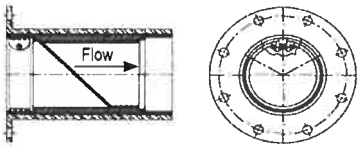
Upstream Flanged



Downstream Flanged Thimble Insert or Extension



Upstream Flanged Thimble Insert or Extension



CheckMate® can be made for any pipe I.D.
Built to fit in sizes from 3-72" (75-1800mm).

Flange shape and bolt pattern can be customized.
Flangeless thimble inserts are available.

	DIMENSIONS											
	NOMINAL PIPE SIZE I.D.		OVERALL LENGTH*		NUMBER OF CLAMPS	CUFF DEPTH		BACK PRESSURE RATING**		WEIGHT***	
	Inches	Millimeters	Inches	Millimeters		Inches	Millimeters	Feet	Meters	lbs	Kg
Low Pressure	3	75	5.1	130	1	1.5	38	5	1.5	0.7	0.3
	4	100	7.9	201	1	1.5	38	5	1.5	1.5	0.7
Standard Pressure	4	100	7.9	201	1	1.5	38	85	26.0	3	1.5
	5	125	9.5	241	1	1.5	38	83	25.3	4	2
	6	150	11.0	279	1	2.0	51	83	25.3	9	4
	7	175	12.8	325	1	2.0	51	79	24.1	11	5
	8	200	15.2	386	1	2.0	51	79	24.1	13	6
	9	225	15.4	391	1	2.0	51	75	22.9	17	8
	10	250	16.1	409	1	2.0	51	71	21.6	20	10
	12	300	19.8	503	1	2.0	51	68	20.1	37	17
	14	350	25.8	655	1	4.0	102	64	20.0	110	50
	15	381	25.8	655	1	4.0	102	62	18.9	120	55
	16	400	28.6	726	1	4.0	102	60	18.3	133	52
	18	450	31.0	787	1	4.0	102	56	17.1	143	65
	20	500	42.1	1069	2	8.0	203	53	16.2	223	102
	24	600	47.5	1207	2	8.0	203	45	13.7	304	137
	26	650	50.0	1270	2	8.0	203	42	12.8	370	168
	28	700	52.0	1321	2	8.0	203	40	12.2	434	197
	30	750	54.9	1395	2	8.0	203	38	11.6	500	227
	36	900	62.3	1582	2	8.0	203	30	9.1	828	376
	42	1050	70.6	1793	2	8.0	203	26	7.9	1423	646
	48	1200	79.0	2007	2	8.0	203	23	7.0	1801	817
	54	1350	86.4	2195	2	8.0	203	17	5.2	2700	1225
	60	1500	96.8	2459	2	9.0	229	15	4.6	3315	1504
	72	1800	119.0	3023	3	12.0	305	13	4.0	6100	2767

*Shorter lengths available.

**Back pressure measured from pipe invert.
Higher back pressure ratings available. Consult factory.

***Weights are approximate and do not include crating.

WALLACE STONE	Project : Corran Ferry	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Ardgour Drainage	Date : 14/10/24	Checked :
	Page No.: 25 of	

Output

Drainage Summary

× **Channel drains**

- Marshalls Birco System
- Required at two locations

× **Gullies**

- Marshalls precast gully pots
- 5 No. proposed
- Insitu brickwork riser to reach carriageway level.

× **Carrier Pipe Network**

- UPVC pipes between standard manholes and system components.

× **Separator**

- 1 No. SPEL Puraceptor P080 1C/SC

× **Outfall**

- 1 No. Marshalls precast headwall - SH10
- Outfall pipe with concrete surround

× **Non-return valve**

- 1 No. tideflex checkmate (or similar approved) located after final manhole

2387 - Ardgour - Drainage Network Schedule

Invert level information:

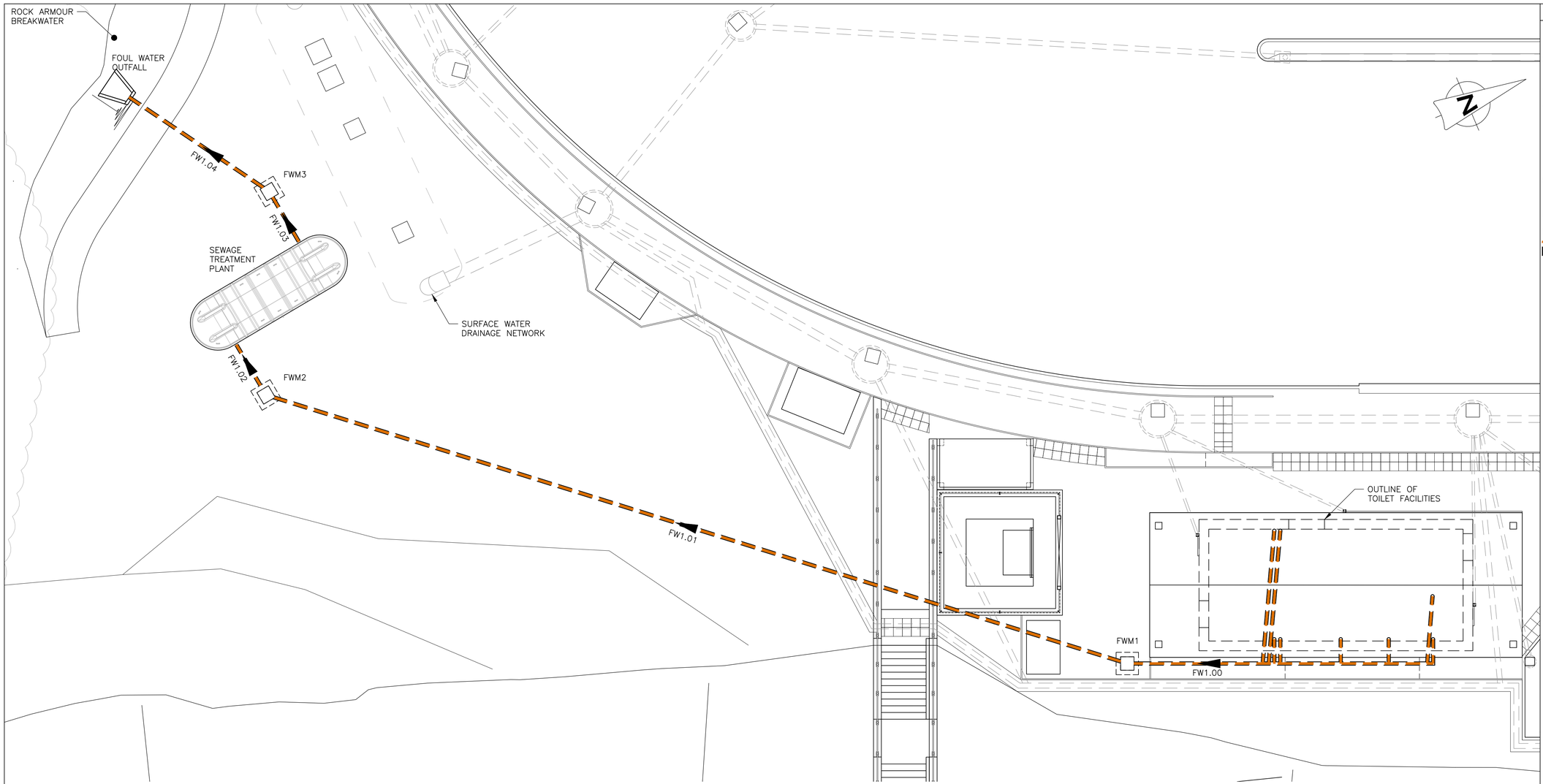
Gully invert depth =	0.750 m	*based on 150mmØ pipe*
Channel drain invert depth =	0.373 m	*based on 150mmØ pipe*

Incoming & outgoing pipe - height differences:

Manhole difference =	0.025 m
Interceptor difference =	0.100 m

DETAILS						INCOMING PIPES			OUTGOING PIPES				
REF	DESCRIPTION	EASTING	NORTHING	COVER/FRAME TYPE	COVER LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)	PIPE LENGTH (m)	PIPE GRADIENT
C1	CHANNEL DRAIN OUTLET	CAD	CAD	-	5.720	-	-	-	C1.00	150	5.347	14.748	1 IN 30
C2	GULLY	CAD	CAD	D400	5.566	-	-	-	C2.00	150	4.816	0.485	1 IN 10
C3	MANHOLE - TYPE C	CAD	CAD	C250	5.706	C1.00 C2.00	150 150	4.855 4.768	C1.01	225	4.743	28.180	1 IN 100
C4	GULLY	CAD	CAD	D400	5.644	-	-	-	C3.00	150	4.894	0.841	1 IN 4
C5	GULLY	CAD	CAD	D400	5.744	-	-	-	C4.00	150	4.994	0.680	1 IN 2
C6	GULLY	CAD	CAD	D400	5.797	-	-	-	C5.00	150	5.424	0.460	1 IN 10
C7	MANHOLE - TYPE C	CAD	CAD	C250	5.937	C1.01 C5.00	225 150	4.461 5.378	C1.02	225	4.436	19.658	1 IN 100
C8	GULLY	CAD	CAD	D400	5.850	-	-	-	C6.00	150	5.100	0.899	1 IN 1
C9	CHANNEL DRAIN OUTLET	CAD	CAD	-	6.000	-	-	-	C7.00	150	5.627	4.733	1 IN 10
C10	MANHOLE - TYPE B 1200Ø	CAD	CAD	C250	6.178	C1.02 C7.00	225 150	4.239 5.154	C1.03	300	4.214	2.150	1 IN 100
INTERCEPTOR	SPEL P080 1C/SC	CAD	CAD	-	6.230	C1.03	300	4.193	C1.04	300	4.093	2.000	1 IN 100
C11	MANHOLE - TYPE B 1200Ø	CAD	CAD	C250	6.280	C1.04	300	4.073	C1.05	300	4.048	7.400	1 IN 100
OUTFALL	OUTFALL	CAD	CAD	-	-	C1.05	300	3.974	-	-	-	-	-

Appendix D – Foul Water Drainage Layouts



FOUL WATER – DRAINAGE NETWORK											
DRAINAGE ELEMENT						INCOMING PIPES			OUTGOING PIPES		
REF	EASTING	NORTHING	TYPE	COVER/FRAME TYPE	COVER LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)
FWM1	202299.464	763810.649	675x675 MH – TYPE C	C250	9.162	FW1.00	150	7.735	FW1.01	150	7.710
FWM2	202273.385	763779.669	675x675 MH – TYPE C	C250	8.000	FW1.01	150	7.058	FW1.02	150	7.033
TREATMENT PLANT	202269.222	763781.572	KLARGESTER BIODISC SEWAGE TREATMENT PLANT (BL MODEL)	–	8.000	FW1.02	150	7.000	FW1.03	150	6.850
FWM3	202265.076	763783.352	675x675 MH – TYPE C	C250	8.000	FW1.03	150	6.817	FW1.04	150	6.792
FOUL OUTFALL	202258.749	763779.239	OUTFALL	–	–	FW1.04	150	6.719	–	–	–

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES RELATIVE TO CHART DATUM UNLESS NOTED OTHERWISE.
3. CHART DATUM IS 1.96m BELOW ORDNANCE DATUM.
4. TIDE LEVELS ARE AS FOLLOWS:

HAT	+4.9mCD
MHWS	+4.4mCD
MHWN	+3.3mCD
MLWN	+1.7mCD
MLWS	+0.7mCD
LAT	0.0mCD

5. FOR SURFACE WATER DRAINAGE LAYOUTS REFER TO DRAWING NUMBER 2387–WS–ZZ–NL–DR–C–5301 & 5302.

LEGEND:

FWM – FOUL WATER MANHOLE
– – – CARRIER PIPE
▬► – FLOW DIRECTION

REV	DATE	DETAILS	DRAWN	CHK'D	APP'D

AMENDMENTS

CLIENT

The Highland Council
Comhairle na Gaidhealtachd

PROJECT

CORRAN FERRY REDEVELOPEMNT

Wallace Stone
Consulting Civil Engineers

GLASGOW
0141 554 8233
glasgow@wallacestone.co.uk

DINGWALL
01349 866775
dingwall@wallacestone.co.uk

DRAWING TITLE

NETHER LOCHABER PROPOSED FOUL WATER DRAINAGE LAYOUT

DRAWN	CHECKED	APPROVED
PM	JA	BP
DATE	DATE	DATE
DEC 24	15.01.25	15.01.25
SCALE (A1) 1:250	STAGE PRELIMINARY	REV P01

DRAWING No.
2387–WS–ZZ–NL–DR–C–5307

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Appendix E – Foul Water Drainage Design Calculations

Calculation Cover Sheet

Wallace Stone

No. of Sheets

Project Title	Corran Ferry Redevelopment		**Project No.** 2387	**File No.**	
Section	Drainage	**Subject**	Foul Water Drainage	**Calc No.**	C-115
Project Manager	Tom Rea	**Design Phase**	A Concept or preliminary ☐ B Analysis and Detailed design ☒		
Designer	Barry Purcell		C Design verification ☐ D Other (specify) ☐		

Computer Applications Used

Title	Version/Date
Excel	
AutoCAD	2024

Scopes of Checking for Manual and Computer Generated Calculations

Sheets Checked	Calculations by			Checked By		
	Name	Signature	Date	Name	Signature	Date
1 - 3	Barry Purcell		07/10/2024	Jamie Arnott		08/10/24
4 - 14	Jamie Arnott		07/11/2024	ALEX SCOTT	Alex Scott.	8/11/24.

a) Basic Design Information or Source and Reference:

Public toilets in managed stations – capacity and user groups
Flows and loads – 4 – sizing criteria, treatment capacity for sewage treatment systems.
Klargester – BioDisc BD-BN sewage treatment plant
ONS – Car and van occupancy data
HR Wallingford & Barr, Table for the hydraulic design of pipes, sewers, and channels
Sewers for Scotland v4.0
Marshalls – Water management and drainage solutions

b) Identify documents/technical records where output will be used:

Drawings
Calculations
Contract Documents

Approved by
Project Manager **Signature** **Date**

Distribution
Original to project file

WALLACE STONE	Project : Corran	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Foul Water Drainage	Date : 07/11/24	Checked :
	Page No.: 0 of	

Output

Introduction

A drainage system is required to deal with foul water as a result of usage of the proposed toilet facilities at Nether Lochaber.

Several drainage outlets will collect foul water from the toilets, wash hand basins and showers contained within the facilities and transfer it to a sewage treatment plant via a carrier pipe and manhole system, prior to discharge to the nearby watercourse (Loch Linnhe).

The calculations start by establishing potential usage and sizing a suitable sewage treatment plant. The foul water drainage network is then designed in accordance with guidance contained within 'Sewers for Scotland v4.0'.

WALLACE STONE	Project : 2387	
Calculation Sheet	Job No. : 2387	Made By : BO.
Description: SEWAGE TREATMENT PLANT SIZING.	Date : 7/10/24.	Checked : JA
	Page No.: 1 of	

Output

SEWAGE TREATMENT PLANT.

- SOURCES : (A) BS 6465 → NOT RELEVANT.
  : (B) PUBLIC TOILETS IN MANAGED STATIONS (NETWORK RAIL)
  : (C) FLOWS & LOADS CODE OF PRACTICE (BRITISH WATER)
  : (D) ONS : CAR/VAN OCCUPANCY DATA

CORRAN : PEAK TRAFFIC

270,000 PER YEAR = 270,000/365 = 740 CARS/DAY.

OPERATING 15hrs (0630-2130)

MAX ROUND TRIPS	1 x 47 PER DAY	(SHUTTLING)	=> 94 TOTAL CROSSINGS.
MAX ROUND TRIPS	2 x 30 PER DAY	(SHUTTLING)	=> 120 TOTAL CROSSINGS
TIMETABLE ROUND TRIPS	34 PER DAY	(TIMETABLE)	= 68 TOTAL CROSSINGS
AVERAGE ROUND TRIPS	40 PER DAY	(AVERAGE)	=> 80 TOTAL CROSSINGS

CAPACITY OF VESSEL:

MV CORRAN = 28 VEHICLES (28 PCU)

NEV = 32 VEHICLES (32 PCU)

DESIGN PEAK.

ASSUME 90 CROSSINGS, 45 FROM NL & 45 FROM ARDGOUR.

FROM ONS DATA VEHICLE OCCUPANCY VARIES

1.2 TO 2.0

TYPICAL VALUES = 1.6 PEOPLE PER VEHICLE/TRIP.

∴ TOTAL NUMBER OF PEOPLE AT NETHER LOCHABER FERRY TERMINAL PER DAY.

CURRENT 45 x 28 x 1.6 = 2016/DY (134/HR)

FUTURE 45 x 32 x 1.6 = 2304/DY (154/HR)

WALLACE STONE	Project : Corran	
Calculation Sheet	Job No. : 2387	Made By : BP
Description: Sewage Treatment Plant Sizing	Date : 07/10/24	Checked : JA
	Page No.: 2 of	

Output

REF (B)

REVIEW PROVISION

$$\text{Nr UNITS} = (U \times A \times T) / P$$

U = POTENTIAL USERS

A = ARRIVAL RATE

T = TIME TAKEN TO USE FACILITY.

P = PERIOD OF TIME CONSIDERED.

T = 0.75 MIN (MEN) } TRAIN DESIGN GUIDANCE.
1.50 MIN (WOMEN) }

MEN: $\left(\left(134/2\right) \times 10\% \times 0.75\right)/60$

↑ ASSUMED: AT RAIL STATIONS, TYPICALLY 5 TO 8%

= 0.08 UNITS. ⇒ 1 MIN.

WOMEN: $\left(\left(134/2\right) \times 10\% \times 1.5\right)/60$

= 0.17 UNITS ⇒ 1 MIN.

HOWEVER, ASSUME AVERAGE RAIL 'WAIT' = 5 MINUTES (ESTIMATE)

AT CORRAN AVERAGE TIME BETWEEN SAILINGS = 20 TO 30 MINS.

∴ % USAGE LIKELY TO INCREASE : ASSUME 30%

MEN = $\left(\left(134/2\right) \times 30\% \times 0.75\right)/60$: 0.25 ⇒ 1.0 UNIT

WOMEN = $\left(\left(134/2\right) \times 30\% \times 1.50\right)/60$ = 0.50 ⇒ 1.0 UNIT.

WALLACE STONE	Project : Corran	
Calculation Sheet	Job No. : 2387	Made By : BP
Description: Sewage Treatment Plant Sizing	Date : 07/10/24	Checked : JA
	Page No.: 3 of	

Output

PROPOSED ACTUAL PROVISION AT CORRAN (NL)

	MEN	WOMEN	DISABLED	CP TOILET
TOILET	2	3	1	1
URINAL	2	-	-	-

PROVISION APPEARS ADEQUATE & MATCHES EXISTING NL TOILET PROVISION + CP TOILET

CONSIDER SEWAGE TREATMENT:

NR OF USES

2016 x 30% = 605 /DAY

2304 x 30% = 691 /DAY.

FROM

		FLOW (L)	BOD (g)	AMMONIA (N)
AMENITY SITE:	TOILET BLOCKS (PER USE)	10	12	2.5
DOMESTIC	STANDARD RESIDENTIAL (PERSON EQUIVALENT)(PE)	150 (x15)	60 (x5)	8 (x3.2)

ASSUME 10 TOILET USES AT TERMINAL = 1 PE

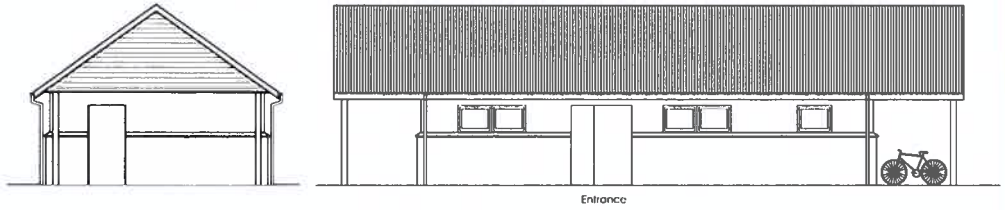
∴ PE ≃ 61 TO 70

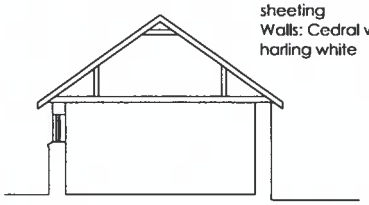
BOD = 691 x 12 = 8.3 kg.

MAX FLOW 691 x 10 = 6.9 m^3

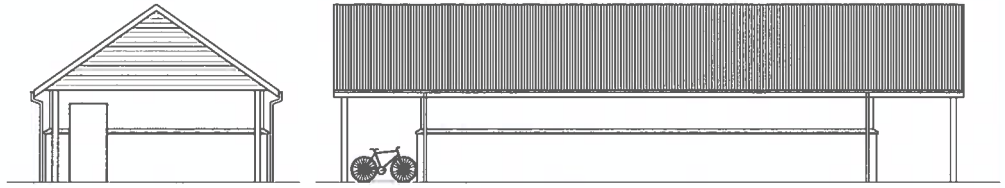
KLARGESTER BIODISC BD-BN SEWAGE TREATMENT PLANT BL MODEL OR SIMILAR

Notes:



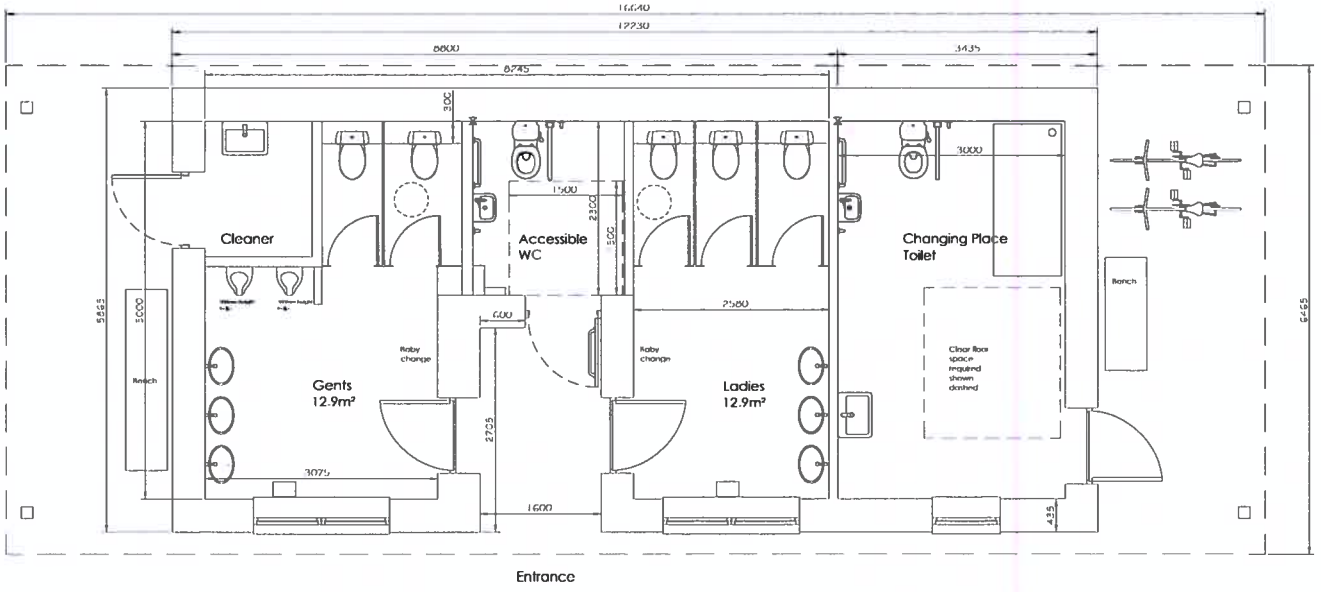


Roof: Dark grey steel sinusoidal sheeting
Walls: Cedral weatherboard / harling white



Scale 1:100

0 1 2 3 4 5 10



FLOOR PLAN

Scale 1:50

0 1 2 3 4 5

REV.	DESCRIPTION	BY.	DATE:
STATUS	for comment		

Matheson Mackenzie Ross
Royal Bank Buildings High St
Dingwall IV15 9HA
01349 863352
nross@mmross.co.uk

CLIENT: The Highland Council
Wallace Stone

ARCHITECT: N Ross

SITE: Corran Ferry Crossing

TITLE: Toilet Facilities
General Arrangement

SCALE AT A2:	DATE:	DRAWN	CHECKED
scale	06/12/23	NHR	Checked
PROJECT NO	DRAWING NO	REVISION	
C2.22	302	-	

WALLACE STONE	Project : Corran	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Foul water Drainage	Date : 07/11/24	Checked :
	Page No.: 5 of	

Output

Flows

To size the sewage treatment plant, flows through the system have been estimated.

Based on the future estimated usage of 691 visits per day (over a 15 hr window)

=> 691 / 15 = 47 per hour

=> 10 L × 47 hr = 470 L/hr => 0.131 L/s

(10 L: each visit generates 10 L of foul water)

=> 470 / 2 / 12 / 60 = 0.326 L/s

(/ 2: assume flow peak is 50 % of hourly total; / 12: 5 min time period; / 60: reduction to seconds)

∴ size pipe system based on **0.326 L/s**

WALLACE STONE	Project : Corran	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Foul Water Drainage	Date : 07/11/24	Checked :
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Output

Sewerage Design

The following design parameters have been implemented in accordance with 'Sewers for Scotland V.4'

× Manholes at changes in alignment, gradient or direction (2.16 / 5)

× Manholes not spaced more than 100m apart (2.16 / 5)

× Minimum clearance between connection and the highest / lowest sewer shall be 150mm (2.16 / 6)

× 1200mm Ø manhole for pipe < 375 mm Ø (2.20 / 2)

× Sewer depth = 1.5m road, 0.9m other (2.21 / 1 & 2)
↑ conservatively assume 1.5m (where possible)

× Minimum pipe Ø = 150mm (2.22 / 1)

× Roughness value, ks = 1.5mm (2.23 / 3)

Propose also:

× UPVC pipework

× Limit gradient to 1 in 60.

WALLACE STONE	Project : Corran	
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Output

Pipe sizing

Min. pipe size = 150mm

Max. pipe gradient = 1 in 60

Flow = 20.201 l/s Velocity = 1.143 m/s

↑ HR Wallingford tables (k_s = 1.5mm)

Max flow = 0.326 l/s

Flow from the minimum pipe size and maximum pipe gradient is significantly greater than the estimated flow through the proposed system.

A19

(p.3 of 4)

k_s = 1·50 mm
S = 0·00400 to 0·02000

ie hydraulic gradient =
1 in 250 to 1 in 50

Water (or sewage) at 15°C,
full bore conditions.

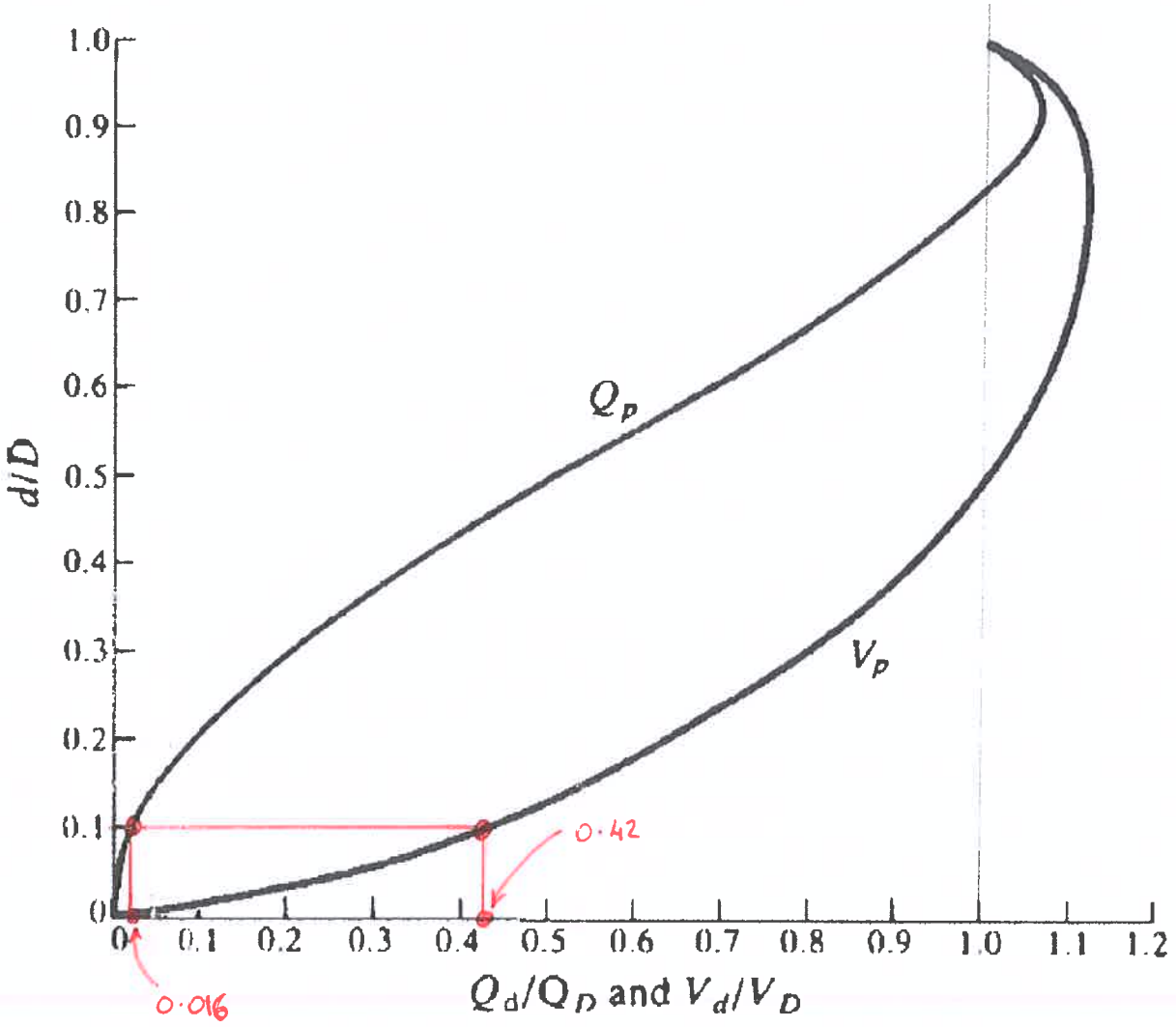
velocities in ms^{-1}
discharges in litres/sec

Gradient	(Equivalent) Pipe diameters in mm													
	150	200	225	250	275	300	350	375	400	450	500	525	600	630
0·00400	0·551	0·669	0·724	0·776	0·826	0·875	0·967	1·012	1·055	1·139	1·219	1·258	1·370	1·414
1/ 250	9·7457	21·017	28·768	38·082	49·068	61·829	93·080	111·76	132·60	181·12	239·32	272·26	387·39	440·62
0·00420	0·565	0·686	0·742	0·795	0·847	0·896	0·991	1·037	1·081	1·167	1·249	1·289	1·404	1·449
1/ 238	9·9689	21·541	29·484	39·030	50·288	63·367	95·392	114·54	135·89	185·61	245·26	279·01	396·99	451·55
0·00440	0·579	0·702	0·759	0·814	0·867	0·918	1·015	1·062	1·107	1·195	1·279	1·319	1·437	1·483
1/ 227	10·226	22·052	30·184	39·955	51·480	64·868	97·651	117·25	139·11	190·00	251·06	285·61	406·38	462·22
0·00460	0·592	0·718	0·776	0·832	0·886	0·938	1·038	1·086	1·132	1·222	1·307	1·349	1·470	1·516
1/ 217	10·458	22·552	30·867	40·860	52·645	66·335	99·858	119·90	142·25	194·29	256·73	292·06	415·55	472·65
0·00480	0·605	0·733	0·793	0·850	0·906	0·959	1·060	1·109	1·156	1·248	1·336	1·378	1·501	1·549
1/ 208	10·686	23·041	31·536	41·745	53·784	67·771	102·02	122·49	145·33	198·49	262·27	298·37	424·52	482·86
0·00500	0·617	0·749	0·810	0·868	0·924	0·979	1·082	1·132	1·180	1·274	1·363	1·407	1·533	1·581
1/ 200	10·908	23·520	32·191	42·611	54·901	69·177	104·13	125·03	148·34	202·61	267·70	304·55	433·31	492·85
0·00550	0·648	0·785	0·849	0·911	0·970	1·027	1·135	1·188	1·238	1·336	1·430	1·476	1·608	1·659
1/ 182	11·446	24·677	33·774	44·705	57·598	72·573	109·24	131·16	155·62	212·54	280·83	319·47	454·54	517·00
0·00600	0·677	0·821	0·887	0·951	1·013	1·073	1·186	1·241	1·294	1·396	1·494	1·542	1·679	1·733
1/ 167	11·959	25·782	35·286	46·709	60·174	75·819	114·13	137·02	162·57	222·04	293·37	333·74	474·83	540·07
0·00650	0·705	0·854	0·924	0·991	1·055	1·117	1·235	1·292	1·347	1·453	1·555	1·605	1·748	1·804
1/ 154	12·452	26·843	36·737	48·625	62·646	78·932	118·81	142·65	169·24	231·14	305·39	347·42	494·29	562·20
0·00700	0·731	0·887	0·959	1·028	1·095	1·159	1·282	1·341	1·398	1·508	1·614	1·666	1·814	1·872
1/ 143	12·926	27·863	38·132	50·471	65·024	81·928	123·32	148·06	175·66	239·90	316·97	360·58	513·01	583·49
0·00750	0·757	0·918	0·993	1·064	1·133	1·200	1·327	1·388	1·447	1·562	1·671	1·724	1·878	1·938
1/ 133	13·382	28·847	39·479	52·253	67·319	84·815	127·67	153·28	181·85	248·36	328·13	373·25	531·06	604·04
0·00800	0·782	0·949	1·026	1·100	1·171	1·239	1·371	1·433	1·495	1·613	1·726	1·781	1·940	2·001
1/ 125	13·825	29·800	40·781	53·976	69·536	87·613	131·87	158·32	187·84	256·53	338·93	385·57	548·55	623·91
0·00850	0·807	0·978	1·057	1·134	1·207	1·278	1·413	1·478	1·541	1·663	1·779	1·836	2·000	2·063
1/ 118	14·254	30·722	42·044	55·647	71·689	90·323	135·95	163·22	193·64	264·46	349·40	397·47	565·48	643·17
0·00900	0·830	1·006	1·088	1·167	1·242	1·315	1·454	1·521	1·586	1·711	1·831	1·890	2·058	2·123
1/ 111	14·670	31·618	43·270	57·268	73·777	92·954	139·91	167·97	199·28	272·15	359·56	409·03	581·93	661·87
0·00950	0·853	1·034	1·118	1·199	1·276	1·351	1·494	1·563	1·629	1·758	1·882	1·941	2·115	2·182
1/ 105	15·075	32·490	44·462	58·848	75·809	95·512	143·75	172·59	204·76	279·63	369·45	420·28	597·92	680·06
0·01000	0·875	1·061	1·147	1·230	1·310	1·386	1·533	1·603	1·672	1·804	1·931	1·992	2·170	2·238
1/ 100	15·469	33·339	45·623	60·382	77·787	98·004	147·50	177·09	210·10	286·92	379·08	431·23	613·50	697·77
0·01100	0·918	1·113	1·204	1·290	1·374	1·454	1·608	1·682	1·754	1·892	2·025	2·090	2·276	2·348
1/ 91	16·229	34·975	47·861	63·343	81·601	102·81	154·73	185·77	220·39	300·97	397·64	452·34	643·52	731·92
0·01200	0·959	1·163	1·258	1·348	1·435	1·519	1·680	1·757	1·832	1·977	2·115	2·183	2·377	2·453
1/ 83	16·950	36·539	50·000	66·173	85·246	107·40	161·64	194·06	230·24	314·40	415·37	472·51	672·21	764·55
0·01300	0·999	1·211	1·309	1·403	1·494	1·582	1·749	1·829	1·907	2·058	2·202	2·272	2·475	2·553
1/ 77	17·652	38·035	52·051	68·887	88·741	111·80	168·26	203·01	239·65	327·28	432·38	491·86	699·73	795·85
0·01400	1·037	1·257	1·359	1·457	1·551	1·642	1·815	1·898	1·979	2·136	2·285	2·358	2·568	2·650
1/ 71	18·325	39·481	54·025	71·499	92·104	116·04	174·64	209·66	248·73	339·67	448·75	510·46	726·21	825·96
0·01500	1·073	1·301	1·407	1·508	1·605	1·699	1·879	1·965	2·049	2·211	2·366	2·441	2·659	2·743
1/ 67	18·959	40·874	55·930	74·018	95·350	120·13	180·79	217·04	257·48	351·62	464·54	528·44	751·76	855·02
0·01600	1·109	1·344	1·453	1·558	1·658	1·755	1·941	2·030	2·116	2·284	2·444	2·521	2·746	2·833
1/ 63	19·595	42·220	57·772	76·456	98·488	124·08	186·73	224·18	265·95	363·19	479·81	545·81	776·47	883·12
0·01700	1·143	1·385	1·498	1·606	1·709	1·810	2·001	2·092	2·182	2·354	2·519	2·599	2·831	2·920
1/ 59	20·201	43·526	59·557	78·818	101·53	127·91	192·50	231·10	274·16	374·39	494·62	562·65	800·42	910·36
0·01800	1·176	1·426	1·541	1·652	1·759	1·862	2·059	2·153	2·245	2·422	2·592	2·675	2·913	3·005
1/ 56	20·790	44·793	61·291	81·111	104·48	131·63	198·10	237·82	282·13	385·28	508·99	579·00	823·68	936·80
0·01900	1·209	1·465	1·584	1·698	1·807	1·913	2·116	2·212	2·307	2·489	2·663	2·748	2·993	3·088
1/ 53	21·363	46·025	62·977	83·342	107·36	135·25	203·54	244·35	289·88	395·86	522·97	594·90	846·29	962·53
0·02000	1·240	1·503	1·625	1·742	1·855	1·963	2·171	2·270	2·367	2·554	2·733	2·820	3·071	3·168
1/ 50	21·920	47·226	64·619	85·515	110·16	138·78	208·84	250·72	297·43	406·17	536·59	610·39	868·32	987·58
	50	70	80	85	95	100	120	130	140	160	170	180	210	220

θ_{medial} for part–full circular pipes.

k_s = 1·50 mm S = 0·00400 to 0·02000

PARTIALLY FULL PIPES



Ref: 'Hydraulics in Civil and Environmental Engineering' by Andrew Chadwick and John Morfett.

Flow, full = 20.201 l/s Flow, actual = 0.326 l/s

Proportion = $\frac{0.326}{20.201} = 0.016$

Velocity (part full) = 1.143 m/s × 0.42 = 0.48 m/s

0.48 < 0.75 m/s ∴ self-cleansing not sufficient for predicted flow.

Self-cleansing criteria satisfied by providing minimum pipe Ø = 150 mm and limiting gradient to 1 in 60

2387 - Nether Lochaber - Foul Water Drainage Network Schedule

Incoming & outgoing pipe - height differences:

Manhole difference =	0.025 m
Treatment plant difference =	0.150 m

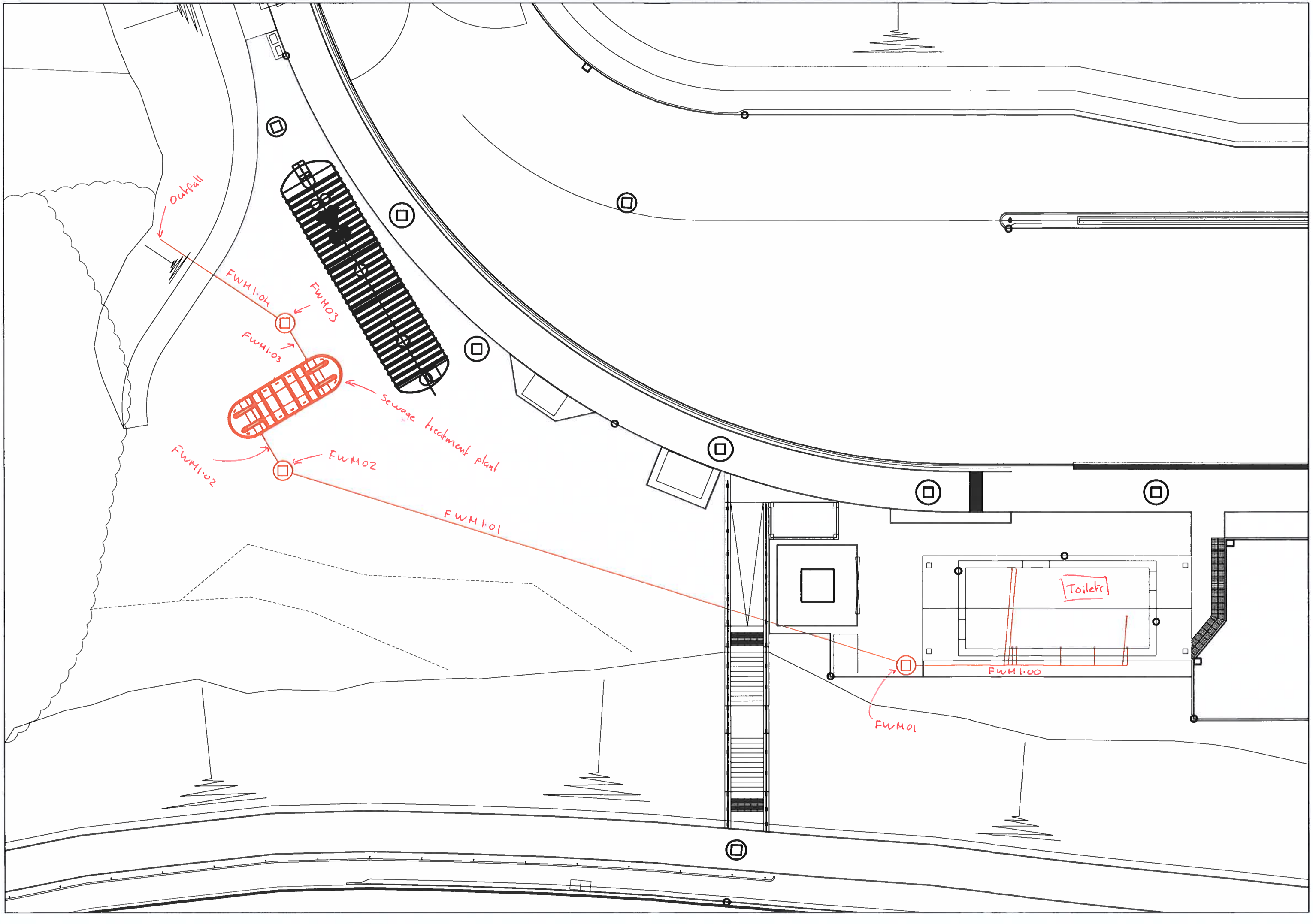
DETAILS						INCOMING PIPES			OUTGOING PIPES				
REF	DESCRIPTION	EASTING	NORTHING	COVER/FRAME TYPE	COVER LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)	REF	DIA (mm)	INVERT LEVEL (mCD)	PIPE LENGTH (m)	PIPE GRADIENT
FWM1	1200Ø MANHOLE	CAD	CAD	C250	9.162	FW1.00	150	7.735	FW1.01	150	7.710	39.100	1 IN 60
FWM2	1200Ø MANHOLE	CAD	CAD	-	8.000	FW1.01	150	7.058	FW1.02	150	7.033	2.000	1 IN 60
TREATMENT PLANT	BIODISC SEWAGE TREATMENT PLANT (BL MODEL)	CAD	CAD	-	8.000	FW1.02	150	7.000	FW1.03	150	6.850	2.000	1 IN 60
FWM3	1200Ø MANHOLE	CAD	CAD	C250	8.000	FW1.03	150	6.817	FW1.04	150	6.792	8.700	1 IN 10
OUTFALL	OUTFALL	CAD	CAD	-	-	FW1.04	150	5.922	-	-	-	-	-

Ground level in area of sewage treatment plant approx. +8.0mCD.

Inlet invert depth for BL model ranges 600/1000mm

Assume max invert depth = 1000mm

Therefore, desired pipe invert level = +7.0mCD


Outfall
FWH1.04
FWH03
FWH1.03
Sewage treatment plant
FWH1.02
FWH02
FWH1.01
Toilets
FWH1.00
FWH01

Headwalls

Marshalls precast concrete headwall system is designed to connect pipe work discharging into open water courses.

A cost-effective alternative to in-situ structures, as well as outlet points from ponds and swales, precast headwalls control erosion and scour resulting from excessive velocities and turbulence, helping prevent adjacent soil from sloughing into the watercourse.

As with all concrete products, the headwalls will weather and natural coverage helps them blend into their environment.

Concrete headwalls can be pre-fitted with Hydro-Brakes®, Penstocks and non-return flap valves depending upon application. Please ask us about our time saving solutions for your headwall requirements.

Features

- Erosion control options suited to your requirements
- Greatly reduced installation time and cost - no on-site shuttering or formwork required
- Low maintenance, secure solution

Technical data

Hole sizes

Designed pipe diam. (mm)	Minimum hole size (mm)	Stock	Made to order
100	130	S20	
150	198	S20, S40*, S60*, S80	
225	320		
300	460	S40*, S60*, S80	
375	540		
450	635	S90	S60
525	720		
600	825		
675	870		S90
750	950		
825	1035		
900	1135		

Headwall sizes	Pipe diameters (mm)
S20	Up to 225
S40	Up to 375
S60	Up to 600
S80	Up to 900

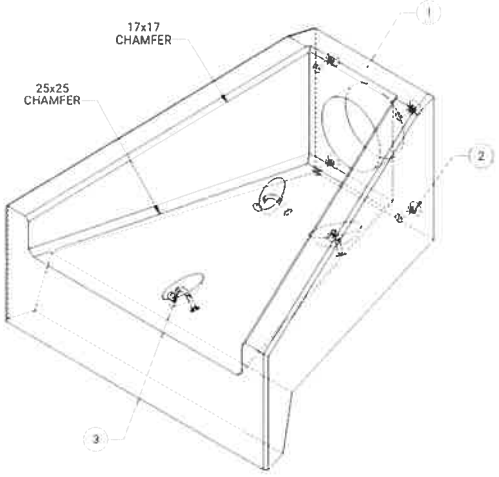
Pipe Ø = 150mm

BOM FOR WSH-S20-C SPILLWAY HEADWALL S20 CORED						
ITEM NO.	ITEM/DWG NO.	DESCRIPTION	MATERIAL	WEIGHT (kg)	NUMBER / AX CODE	Default/QTY
1	WSH-S20-C	SPILLWAY HEADWALL S20C	C40/50	VARIES	VARIES	1
2	6000-2.5-0085	LIFTING PIN	1.5714 (16NiCr4)	0.16	MA005468	4
3	ST UA	ST UTILITY ANCHOR	S275JR	0.39	MA104957	3

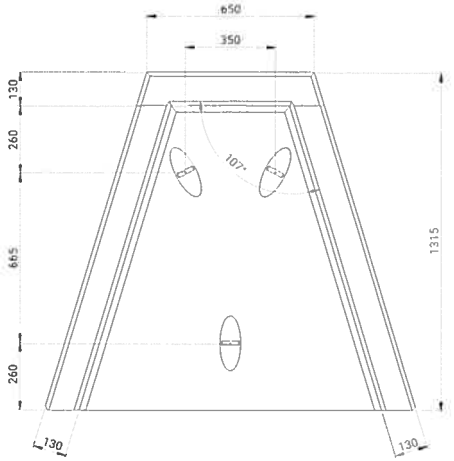
PIPE ⌀ (mm)	NOMINAL HOLE ⌀ (a) (mm)	OFFSET (b) (mm)	OFFSET (c) (mm)
100	130	170	345
150	198	195	370
225	320	232	407

NOTE OTHER PIPE SIZE OPENINGS AVAILABLE UPON REQUEST

GENERAL NOTES.
- THIS DRAWING IS NOT TO BE SCALED, FIGURED DIMENSION ONLY TO BE USED. ANY DISCREPANCY TO BE REPORTED TO MARSHALLS CIVILS & DRAINAGE.
- ALL DIMENSIONS SHOWN IN MILLIMETRES



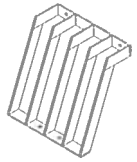
ISOMETRIC VIEW



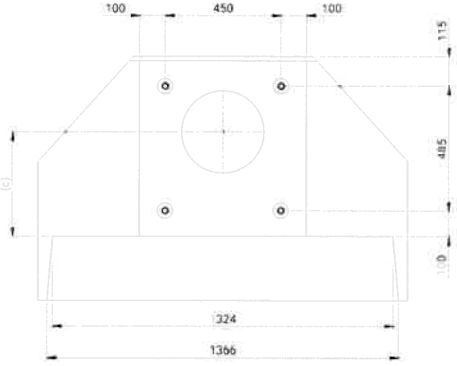
PLAN VIEW

OPTIONAL EXTRAS

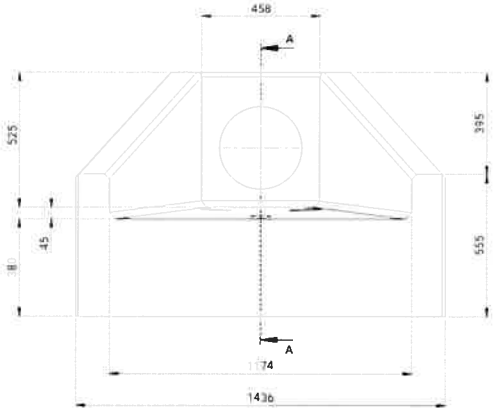
STANDARD GRILLE
SCALE: 1:10



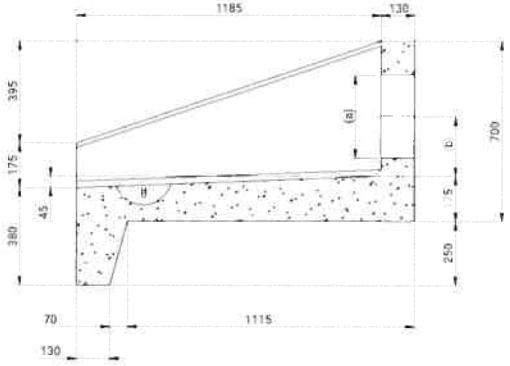
SLOPING GRILLE
SCALE: 1:10



REAR VIEW



FRONT VIEW



SECTION A-A

INFORMATION

Marshalls Civils & Drainage

SPILLWAY HEADWALL S20 - CORED

PRECAST UNIT DETAIL

HT	MJ	1:10	A3
19/05/20	WSH-S20-C		

WALLACE STONE	Project : Corran	
Calculation Sheet	Job No. : 2387	Made By : JA
Description: Foul Water Drainage	Date : 08/11/24	Checked :
	Page No.: 14 of	

Output

Summary

Foul water system drains proposed toilet facilities at Nether Lochaber.

Proposals :

- 150 mm Ø pipe network (UPVC)
- Gradient, generally 1:60 except at outfall.
- k_s = 1.5mm (Sewers for Scotland guidance)
- FW sewer under SW network.
- Sewage treatment plant
  - ↳ BL model from Klargester Bio Disc range.
- Precast concrete headwall
  - ↳ S20 headwall by Marshalls.

2

Public Toilets In Managed Stations
Capacity and User Groups

2.1 User Groups

2.1.1 Diversity Impact Assessment

A Network Rail's Diversity Impact Assessment (DIA) should be undertaken on an individual project basis to give due consideration to all user groups.[1a]

2.1.2 Men and Women

Women require a higher level of public toilet provision than men, as they require longer to use the toilet, and have more reasons to use the toilet. [1b]

Women require twice as many appliances as men to achieve equal waiting time (see section 2.2), and have historically been under-provided with toilets, therefore it should not be assumed that existing facilities for women are adequate in terms of quantity.

When calculating the numbers of appliances required, one urinal should be counted as equivalent to one WC.

2.1.3 Children and Babies

Unisex baby-changing facilities should be provided, however, it is also advantageous to provide baby-changing facilities within separate-sex areas. This can be achieved using:

A) Family Toilet. Enabling a parent or carer, young child and baby to all use the same facility, a family toilet should contain a screened WC, washbasin and baby-changing unit with adjacent toddler seat. The inclusion of an additional, smaller, WC for children should be considered where space allows. The cubicle and door should be large enough to accommodate a double pushchair (see section 3.6).

B) An enlarged toilet cubicle that can incorporate a baby changing unit, and can also be used by people who need more space and by people with luggage (see section 3.5).

Additional baby-changing options are described in BS6465-4:2010, 10.2.3.

2.1.4 Persons with disabilities and persons of reduced mobility (PRMs)

'Persons with disabilities and persons of reduced mobility' means any person who has a permanent or temporary physical, mental, intellectual or sensory impairment which, in interaction with various barriers, may hinder their full and effective use of transport on an equal basis with other passengers, or whose mobility when using transport is reduced due to age.[1c]

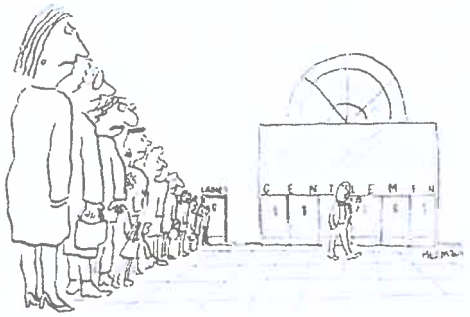
With the increased mobility of disabled people and the UK's ageing population, public toilets should contain accessible provision as described on page 16. This should include Changing Places toilets at larger stations.

In areas such as stations, where people are likely to be carrying luggage, step-free access, additional circulation space and larger cubicle sizes should all be considered.

2.1.5 Gender Neutral see section 3.13

2.1.6 Multi-Faith Facilities

Sanitary accommodation respecting religious and faith sensitivities should be provided for where applicable, however, the design and specification of such accommodation is beyond the scope of this document. It is necessary to obtain specialist advice for such facilities. Contact:
multifaith@networkrail.co.uk



Louis Hellman, *Queuing for the ladies*, 1992, cartoon first published in *Access by Design*, accessed February 17, 2020, www.louishellman.co.uk

1a. Under the Equality Act a DIA is the tool used by Network Rail to demonstrate its Public Sector Equality Duty responsibilities are met.

1b. Invisible Women- Gender neutral with urinals. Caroline Criado Perez

1c. Commission Regulation (EU) No 1300/2014 (PRM TSI), 2.2 - Definition of 'person with disabilities and person with reduced mobility'

2.2 Calculating Provision

The levels of WC provision required will be affected by several factors across stations; the calculations shown here are indicative only and WC provision should be considered on an individual station basis.

Network Rail's recommends that 1 unit (WC/urinal) be provided per 2500 - 3000 passengers of daily throughput.

Therefore, the recommended method for calculating provision is as follows:

AM 3 hour peak x 4 = Daily peak Daily peak / 3000 = Total units required

The 'AM 3 hour peak' is the total number of passenger entries/exits on a typical weekday between 07:00 - 09:59.

The average time a person takes to use the facilities should be taken as 1.5 minutes for women and 0.75 minutes for men.[2] Therefore, assuming an equal number of male and female users, there should be twice as many female units provided as male units.

To calculate the provision required for female/male WC's:

Total units required x 2/3 = Female Units
Total units required x 1/3 = Male Units

These calculations are only for the provision of separate-sex facilities; unisex facilities should be provided in addition to the calculated 'total units required' (see section 2.4).

Further guidance on calculating provision is available within BS6465-4:2010, and BS6465-1:2006.

Example

Liverpool Street Station

AM 3 hour peak arrivals and departures = 79,687 (2017)
79,687 x 4 = 318,748 daily peak
318,478 / 3000 = 106 total units

106 x 2/3 = **71 female units**
106 x 1/3 = **35 male units**

WC counts at three London stations show a pattern in WC usage on a typical weekday, with two peaks at 11:00 - 12:00 and 18:00 - 19:00. WC's are more frequently visited in the PM peak, despite greater passenger numbers in the AM peak.

Counts over a one week duration show that patterns of usage vary depending on the location of each station. Stations serving financial districts see highest WC usage on a Friday, with significantly less usage on weekends. Stations with a greater proportion of leisure travellers see a gradual increase in WC usage throughout the week, with highest WC usage on a Saturday.

The quantity of separate-sex WC's and the gender split should be considered on an individual station basis. In certain circumstances the level of provision for each gender may need to be varied to accommodate passenger demographics, particularly in stations where there are both significantly more male customers during the week, and a significant decrease in passenger numbers at the weekend (e.g. London Cannon Street).

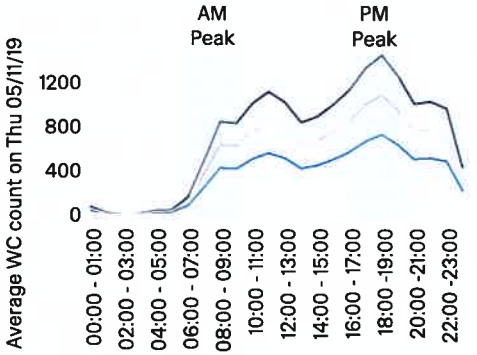


Fig. 01 - Hourly Variation in WC Usage

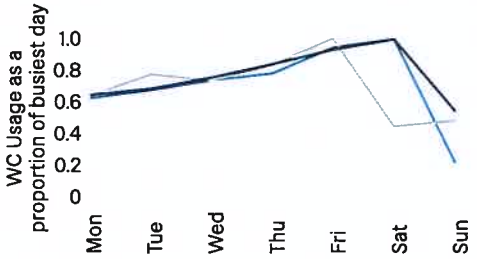


Fig. 02 - Daily Variation in WC Usage

Key:

— London Waterloo
— London Charing Cross
— London Cannon Street

2. *BS6465-4:2010, 11.2.3.4.3 Time a person takes to use the facilities*

2.3 Calculating Provision (Alternative Method)

An alternative method for calculating WC provision can be found in BS6465-4:2010. This equation is used to determine provision in all public environments and is not specific to rail stations, therefore **it is recommended to use the Network Rail method as described on the previous page.** The level of provision in stations should always exceed the requirements as calculated using the below method.

N = (U x A x T) / P

N = Total units
U = Total potential users
A = Arrival rate, i.e. the percentage (as a decimal fraction) of the number of potential users (U) likely to use the WC's in a given period (P);
T is the time a person takes to use the facilities (in minutes);
P is the period of time used for measurement (in minutes).

The number of units required for male and female WC's should be calculated separately as T (time a person takes to use the facility) is 0.75 minutes for men and 1.5 minutes for women. [3]

3. *BS6465-4:2010, 11.2.3.4.3 Time a person takes to use the facilities*

Extrapolating figures on WC usage over a one week period gives an approximate number of users for a year, and a corresponding average arrival rate (i.e. the percentage of the number of potential users likely to use the WC's).

London Waterloo: 6.5%
London Charing Cross: 8.1%
London Cannon Street: 4.4%

Following the upgrade to the WC's at London Victoria, the arrival rate has increased significantly as customer perceptions of the WC's improve. For the purposes of calculation, the arrival rate in stations is assumed to be 9%.

Fig. 04 shows that WC usage at London Waterloo is 50% greater amongst men than women during the week, with equal numbers of men and women using WC's at the weekend.

For the purposes of calculation, it is assumed that equal numbers of men and women will require use of the WC's.

Stations serving long distance destinations are likely to see longer dwell times, and an increased demand for WC's. Non-travellers using the station (up to a third of station users in some instances) should be considered.

Example

Liverpool Street Station

AM 1 hour peak arrivals and departures = 37,319 (2017)
U = 37,319 / 2 = 18,660
A = 9%
T = 0.75 or 1.5 minutes
P = 60 minutes

Female Units:
(18,660 x 0.09 x 1.5) / 60 = **42**

Male Units:
(18,660 x 0.09 x 0.75) / 60 = **21**

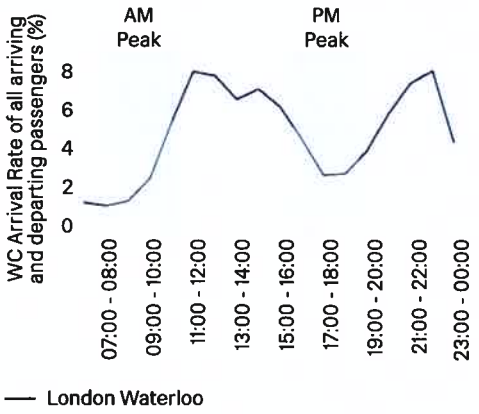


Fig. 03 - Hourly Variation in Arrival Rate

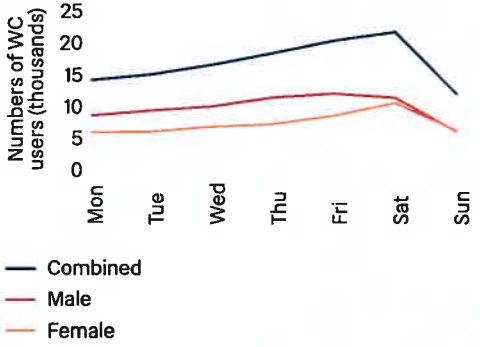


Fig. 04 - WC Usage by Gender - London Waterloo

2.4 Quantity of appliances required

In general, one urinal should be counted as equivalent to one WC when calculating the numbers of appliances required. The following refers only to the quantity of appliances within separate-sex facilities.

When calculating the number of appliances required in male facilities, every male toilet should have at least one WC, and at least one WC per 4 urinals or part thereof. [4]

To determine the number of WC's and urinals required:
Total units required / 5 = WC's required (round up to integer)
Total units - WC's = Urinals required

It is recommended to provide one washbasin for every WC, however, where space is particularly constrained, it is acceptable to provide one washbasin for every two WC's (Fig. 05). [5]

A minimum of one washbasin should be provided for every five urinals (Fig. 06). [5]

Where two or more washbasins are provided, at least one washbasin (and soap dispenser if separate) with its rim between 720 mm and 750 mm above finished floor level should be provided for use by children and people of short stature (Fig 05). [6] Additionally, a minimum of one urinal should be fitted at low level for children and people of short stature (Fig. 06). [7]

Where there are four or more WC cubicles in separate-sex toilet accommodation, one of these should be an enlarged cubicle (1200 mm minimum width) for use by people who need extra space (Fig 05). [8]

Requirements for cubicles, urinals and washbasins for wheelchair users and people with ambulant mobility impairments are described overleaf.

Guidance on space planning for separate-sex cubicles, urinals and washbasins can be found in Section 3 of this document.

4. *BS6465-4:2010, 10.1.3 Men and women*
5. *BS6465-4:2010, 19.10.1.1 Hand washing*
6. *BS6465-4:2010, 19.10.1.3 Hand washing*
7. *BS6465-1:2006, 5.3.2.9 General provisions*
8. *BS6465-4:2010, 10.3.2 Disabled people*

Example

Prior calculations (see page 12) determined 35 male units and 71 female units required.

Male Units:
35 (Total) / 5 = **7 WC's**
35 (Total) - 7 WC's = **28 urinals**
Male Washbasins:
7 WC's / 2 = 3.5 → 4 min.
28 Urinals / 5 = 5.6 → 6 min.
4 + 6 = **Min. 10 washbasins**

Female Units:
71 Total = **71 WC's**
Female Washbasins:
71 WC's / 2 = 35.5 → = **Min. 36 washbasins**

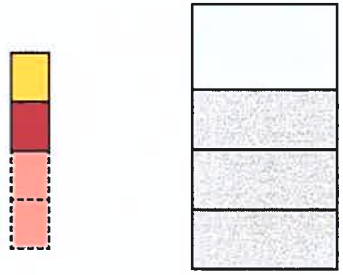
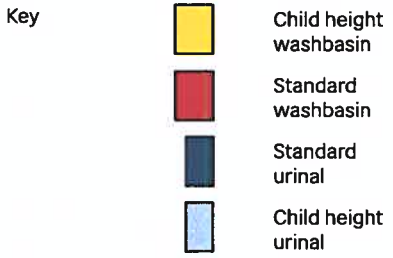


Fig. 05

Fig. 06



2.4 Quantity of appliances required (continued)

Separate-sex facilities should provide WC's, urinals, and washbasins accessible to people with ambulant mobility impairments. Where applicable, male facilities should also provide urinals and washbasins accessible to wheelchair users.

Accessible WC compartments for people with ambulant mobility impairments, often referred to as 'ambulant cubicles', should make up 10% of cubicles, with a minimum of one (Fig. 07).[9] Example layouts for ambulant cubicles are provided in section 3.4 of this document.

A minimum of one urinal accessible to people with ambulant mobility impairments should be provided in male separate-sex facilities. In addition, a minimum of one urinal accessible to wheelchair users should be provided where separate-sex facilities are wheelchair accessible (Fig. 08).

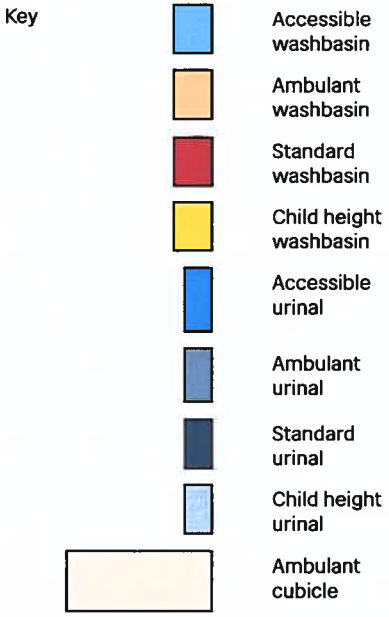
Urinals accessible to wheelchair users and people with ambulant mobility impairments should have vertical grab rails fitted on either side of a urinal where stall privacy dividers are not fitted, in accordance with Fig. 47 of BS8300-2:2018. It is preferable to provide vertical grab rails in addition to stall privacy dividers as shown on page 26 of this document.

Separate-sex facilities should provide washbasins with various rim heights above finished floor level as follows:

- **For people with ambulant mobility impairments, between 780 mm and 800 mm**
- **For use by children and people of short stature, between 720 mm and 750 mm**
- **Where a wheelchair accessible urinal is provided, one washbasin with its rim between 680 mm and 700 mm above finished floor level should also be provided.**[10]

Where it is impractical to provide washbasins at more than two heights, the lowest height required in that instance should be provided in addition to standard washbasins with rim 850 mm above finished floor level (Fig. 08).

Guidance on space planning for cubicles, urinals and washbasins for wheelchair users and people with ambulant mobility impairments can be found in Section 3 of this document.



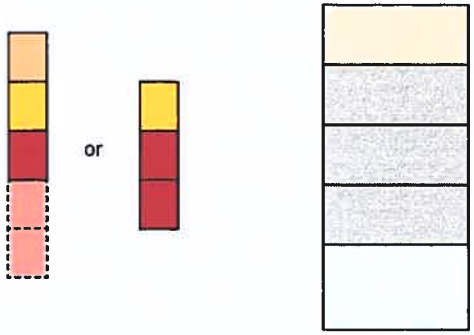


Fig. 07

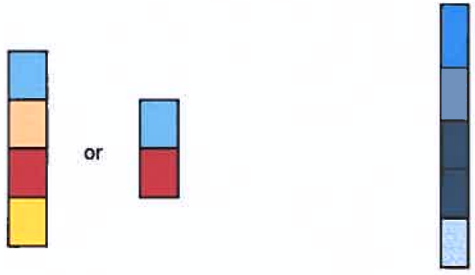
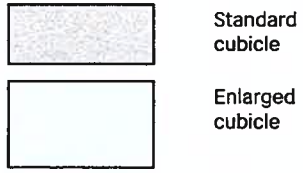


Fig. 08



9. *BS6465-4:2010, 10.1.3 Men and women*
10. *BS8300-2:2018, 18.5.4 Accessible urinals*

2.5 Accessible and Unisex Facilities

Accessible and gender-neutral sanitary accommodation should be provided for those that require it; providing the equitable provision with the same level of dignity as separate-sex facilities.

Passenger throughput in stations may determine the quantity of unisex and accessible facilities that are to be provided. The following list describes the minimum requirements and additional recommended facilities:

Required in all stations:

- A minimum of one unisex accessible toilet.
- A minimum of one unisex accessible baby changing facility.
- A minimum of one unisex toilet for people with ambulant mobility impairments.

Recommended in all stations:

- A minimum of one dedicated gender-neutral self-contained toilet.

Recommended in Category A stations:

- Changing Places toilet (see 3.14).

Where only one of any unisex/ accessible facility is provided, it should be designed for right-hand transfer. Where more than one of any unisex facility can be accommodated, a choice of left-hand and right-hand transfer layouts should be provided. In large stations, it is recommended that unisex accessible toilets are provided for both left-hand and right-hand transfer to accommodate as wide a range as possible of assisted and independent disabled users.[11]

The unisex accessible toilet and unisex accessible baby changing facility have previously often been incorporated within the same room. These facilities should be provided in separate rooms to safeguard the availability of the toilet for those who need it. It is desirable, but not mandatory, for the accessible baby changing facility to incorporate a WC.[12]

Guidance on how to control access to accessible and unisex facilities is provided overleaf.

11. *BS8300-2:2018, 20.2.8 Toilet accommodation*
12. *BS8300-2:2018, 18.4 Accessible baby changing facilities*

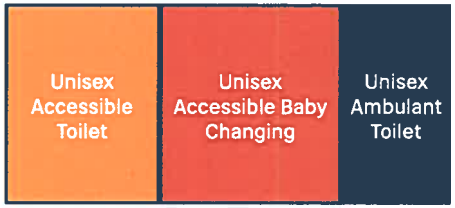


Fig. 09 - Required

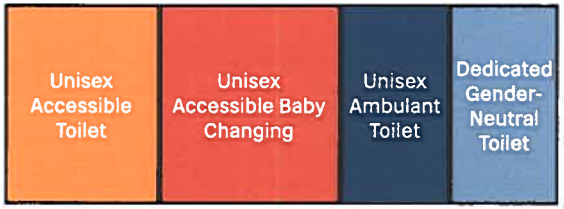
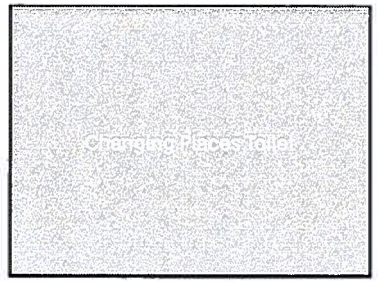


Fig. 10 - Recommended



Guidance on space planning for unisex facilities can be found in Section 3 of this document.

2.5 Accessible and Unisex Facilities (continued)

Accessible sanitary accommodation may be misused for other purposes such as baby feeding because no other alternatives are available. This is an unsuitable location for such an activity and may prevent access for those that require use of the accessible facilities.

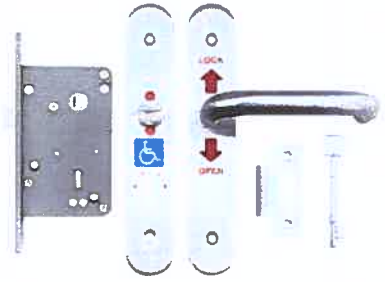
All activities related to sanitary accommodation that may need to be carried out whilst in the station should be considered and provided for wherever possible. In this instance, it would be advantageous to provide a dedicated hygienic space with a washbasin for those who might need to express milk or for parents who wish to be private.

2.5.1 Access Control

Accessible and unisex sanitary accommodation is often subject to misuse by the general public due to the self-contained nature of these facilities. For this reason, accessible facilities should be fitted with controlled access through use of a RADAR (Royal Association for Disability and Rehabilitation) approved lock.

Unisex sanitary accommodation that is not designed for use by PRMs, such as a dedicated gender-neutral WC, should not have controlled access to safeguard the availability of the facility for all those who require it.

Specialist facilities such as a Changing Places toilet should be available and fully operational for customers who require them. Where there is a risk of a facility being mistreated by others in the station, the facility should be locked with a key or code particular to the station (not RADAR). Visitors should be able to request the code, usually through an attendant, which relies on a member of staff being available at all times.



RADAR (Royal Association for Disability and Rehabilitation) approved lock and key

Accessible/Unisex Facility Type	Access Control
Unisex Accessible Toilet	RADAR Lock
Unisex Accessible Baby Changing	RADAR Lock
Unisex Ambulant Toilet	RADAR Lock
Dedicated Gender-Neutral Toilet	No controlled access
Changing Places Toilet	Station specific lock (accessible on request)

Table 01 - Access Control for Unisex Facilities

2.5.2 Inclusive Wayfinding

Inclusive wayfinding is a key part of the design of accessible and unisex facilities, facilitating easier access for persons of reduced mobility (PRMs).

Sufficient colour contrast between elements on signage should be checked using the Light Reflectance Values (LRV) of each colour. Colours should meet the industry standard of a minimum 70% LRV contrast between sign text/pictogram and background, and comply with the contrast table as in BS EN 16584-1:2017 Part 1: Contrast.

Wayfinding strategies should consider the needs of blind and partially sighted people. Toilets should be provided with repeater speakers from the public address system so that people using WC facilities do not miss important information. [13]

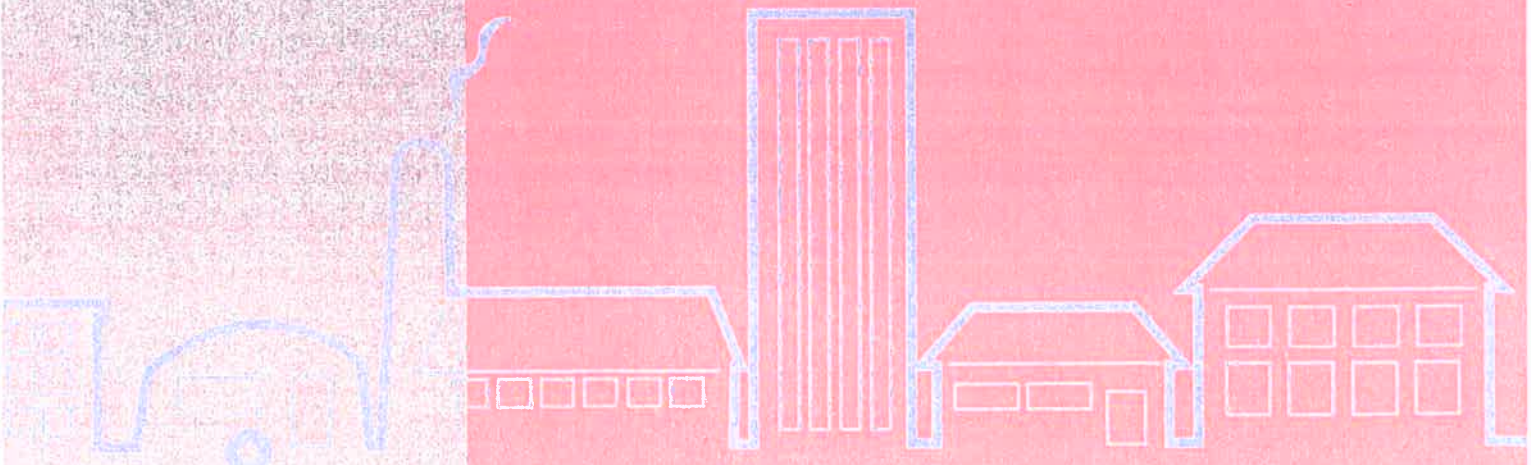
If braille signage is provided it sh ould be easy to locate and should be integrated as part of a sensory or tactile trail provided to guide users to facilities.

13. *BS8300-2:2018, 20.2.8 Toilet accommodation*

Code of Practice

Flows and Loads – 4

Sizing Criteria, Treatment Capacity for Sewage Treatment Systems



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BRITISH WATER
expertise worldwide

Code of Practice

Flows and Loads – Sizing Criteria, Treatment Capacity for Sewage Treatment Systems

This code of practice was prepared by the British Water Package Sewage Treatment Plant Focus Group comprising manufacturers, suppliers and service companies of all types of small wastewater treatment systems.

The Environment Agency, the Northern Ireland Environment Agency and the Scottish Environment Protection Agency support the use of this code of practice, but the Agencies do not specifically endorse any particular manufacturer's product.

This code of practice provides a table of loadings which allows the total daily sewage load from properties to be calculated and it is recommended that all designers should use this table when sizing and designing non-mains sewage treatment systems. The flows and loads values given represent current best knowledge within the UK but may change with time in line with per capita water use.

Where proposed alternative usage rates or methods of sizing might be more appropriate for a particular application this should be supported by the collection of data or additional site specific evidence to validate the proposal. Professional judgment is required and may be used to compare alternatives especially when assessing sewage strengths and treatability.

Guidance is provided to assist the user to identify the various sources of sewage, to consider the nature of the sewage to be treated and to make users aware of issues which may affect treatability and system performance. Each manufacturer is aware of the capabilities of their own systems with respect to different situations.

The table of loadings may be used to design all sizes of sewage treatment systems serving up to 1000 population.

Use of this code of practice by all UK manufacturers and system designers will:

- help to clearly define site activity and sewage sources
- promote a consistent approach to collecting accurate and complete loading information
- provide consistent information about problem effluents and treatability, and
- promote the design and installation of appropriate treatment systems and so reduce the problem of undersized systems causing environmental contamination.

The loadings in this code of practice are more comprehensive than in previously published guidance, they are generally higher and include values for ammonia.

1 Scope

The purpose of this code of practice is to provide an appropriate table of loadings (volumes and loads) to allow the total daily load entering a treatment system to be calculated.

2 Regulations

Early contact with the Regulator to discuss the proposed discharge of sewage effluent is advisable.

- Planning requirements, eg *DETR Circular 3/99, site survey, etc.*
- Building regulations, eg part H *DTLR England & Wales, part M Scotland, Water (Northern Ireland) Order 1999 and Northern Ireland building regulations.*
- A Permit, Authorisation or Consent to discharge will be required from the environmental regulators (the Agencies).
- Planning permission (Local Authority Planning Guidance).

3 Definitions of terms

- **Population (P)** – number of people the system will serve.
- **Biochemical oxygen demand (BOD_5)** – Mass concentration of dissolved oxygen consumed under specified conditions (5 days at 20° C with nitrification inhibition) by the biological oxidation of organic and/or inorganic matter in water.
- **Ammonia expressed as mg/l N** – Ammonia is NH_3, Ammonium is NH_4OH. In wastewater we frequently refer to and use the word/symbol, ammonia/NH_3. The term ammonia usually includes ammonium as well.

4 Selection considerations – all applications

- Values and conditions required by any regulatory permit or consent.
- Loading figures for each specified load are given for Flow, BOD and NH_3.
- The user/purchaser of the system must declare **ALL ACTIVITIES** to enable all loads entering the treatment system to be identified and evaluated. The user/purchaser should be made aware that there is a risk of poor performance from the equipment if loads are understated. The accuracy of the declared loads is of paramount importance.
- Guidance points given under each category suggest questions to enable the specifier to recognise variable or unusual loads, particular to that site, to improve correct system selection and design.
- Total daily loadings are calculated based on the anticipated final maximum capacity of the site. New sites initially may have a reduced business level but the system suggested should reflect the full business potential, e.g. a system suggested for a hotel or caravan site or any other application, with an average 80% occupancy rate should be designed to handle 100% occupancy. The equipment selected by the specifier should reflect the maximum potential of the site. Where a specifier is instructed to use lower occupancy rates, this should be recorded. Flow balancing should be considered where appropriate
- Excess disinfectants, chemicals, etc can affect the biological processes as can specific toxic substances from site activities e.g. photographic chemicals, weed killers, motor oils. It is assumed that these substances are excluded from the wastes to be treated.
- Some water treatment equipment effluents eg softeners, chlorinated backwashes may not be acceptable; system designers should specifically accept or exclude their use. Many treatment system designs will accept regenerants into their units, however this must be checked and agreed.
- Water saving devices affect sewage strength, the impact of their installation should be identified.
- Laundries affect sewage strength and treatability; their proportion should be identified.
- Surface/storm water is not permitted as part of the wastewater stream and must be excluded.
- It is assumed, unless stated, that waste disposal units (WDU) are not in use.
- Undersizing of equipment is to be avoided as it is always better to have a plant slightly oversized, rather than on the limit or undersized.

The owner of the treatment system holds the permit, consent or authorisation to discharge and should be aware that he is responsible for the effluent quality discharged. Thus all sources of discharge into the system must be declared. It is an offence if the effluent fails to comply with the regulators requirements.

(continued on page 4)

Table of Loadings for Sewage Treatment Systems

Per person / activity / day (unless otherwise specified)	FLOW (Litres)	BOD (Grams)	Ammonia as N (Grams)
DOMESTIC DWELLINGS			
Standard residential	150	60	8
Mobile home type caravans with full services	150	60	8
INDUSTRIAL			
Office / Factory without canteen	50	25	5
Office / Factory with canteen	100	38	5
Open industrial site, e.g. construction, quarry, without canteen	60	25	5
*Full-time Day Staff	90	38	5
*Part-time Staff (4 hr shift)	45	25	3
SCHOOLS			
Non-residential with canteen cooking on site	90	38	5
Non-residential without a canteen	50	25	5
Boarding school (i) residents	175	60	8
(ii) day staff (inc. mid-day meal)	90	38	5
HOTELS, PUBS & CLUBS			
Hotel Guests (Prestige hotels)	300	105	12
Hotel Guests (3* & 4* hotels)	250	94	10
Guests (Bedroom only – no meals)	80	50	6
Residential Training/Conference Guest (inclusive all meals)	350	150	15
Non residential Conference Guest	60	25	2.5
Drinkers	12	15	5
Holiday camp chalet resident	227	94	10
Resident Staff	180	75	10
Restaurants - Full Meals - luxury catering	30	38	4
- pre-prepared catering	25	30	2.5
- Snack Bars & bar meals	15	19	2.5
- Function Rooms including buffets	15	19	2.5
- Fast Food i.e. (roadside restaurants)	12	12	2.5
- Fast Food Meal (burger chain and similar)	12	15	4
Students (Accommodation only)	100	60	8
AMENITY SITES			
Toilet Blocks (per use)	10	12	2.5
Toilet (WC) (per use)	10	12	2.5
Toilet (Urinal) (per use)	5	12	2.5
Toilet Blocks in long stay car parks/lorry parks (per use)	10	19	4
Shower (per use)	40	19	2
Golf Club	20	19	5
Local community sports club, e.g. squash, rugby & football	40	25	6
Swimming (where a separate pool exists without an associated sports centre)	10	12	2.5
Health Club/Sports Centre	50	19	4
Tent sites	75	44	8
Caravan Sites - (i) Touring not serviced	100	44	8
(ii) Static not serviced	100	44	8
(iii) Static fully serviced	150	60	8
HOSPITALS & RESIDENTIAL CARE HOMES			
Residential old people / nursing	350	110	13
Small hospitals	450	140	Assess
Large hospitals	Assess individually		

*Staff figures also apply to other applications

- *After installation, if the system is overloaded, due to activities that were not previously identified by the owner/ purchaser of the system, then the manufacturer may not be able to assist with meeting the legal obligations of the permit provided by the regulator. The regulator has the right to review permits and change them if necessary.*
- *All sewage treatment system should be maintained according to the manufacturer's instructions by a certified engineer trained in accordance with the British Water Maintenance and Service Code of Practice.*

5 Domestic housing

- A treatment system for a single house with **up to and including 3 bedrooms** shall be designed for a minimum population (P) of 5 people.
- The size of a treatment system for a single house with more than 3 bedrooms shall be designed by **adding 1 P** for **each additional bedroom** to the **minimum single house value of 5 P,** eg:
  - house with 3 bedrooms = **minimum 5 P system**
  - house with 4 bedrooms = **minimum 6 P system (5+1)**
  - house with 6 bedrooms = **minimum 8 P system (5+3).**
- For groups of small 1 and 2 bedroom houses or flats
  - flat with 1 bedroom = **allow 3 P**
  - flat with 2 bedrooms = **allow 4 P**
- A treatment system serving a group of houses shall be designed by adding together the P values for each house calculated independently, eg:
  - for a group of two houses (3 and 4 bedrooms, respectively) the system shall be for a minimum of 11 P (5+6)
- **If the calculated total P for a group of houses exceeds 12 P then some reduction may be made** to allow for the balancing effects on daily flow of a group of houses (round UP not down)
  - **Where the total is 13-25 P** multiply the total by 0.9 to give an adjusted P value, e.g. if there are four four-bedroom houses the total P will be 24 P (4 x 6) and the adjusted P will be 22 P (24 x 0.9 = 21.6)
  - **Where the total is 26-50 P** multiply the total by 0.8 to give an adjusted P value, e.g. if there are four three-bedroom houses and three four-bedroom houses the total P will be 38 P (4 x 5 and 3 x 6) and the adjusted P will be 31 P (38 x 0.8 = 30.4)
- Where there are larger groups of houses, the P should be estimated using both the expected total load and the flow, considering both peak and total flow
- These are minimum recommended population (P) loads, they should not be modified downwards, upward modification may be necessary because of particular characteristics of each property or groups of properties.
- The above assessments of population (P) should be used for both existing and new properties

- *Larger luxurious houses tend to have greater loads and increased water consumption with variability.*
- *Holiday homes tend to have higher occupancies, with perhaps, lounges also acting as bedrooms. Holiday lets and second homes may be used intermittently*
- *Check for unusual water uses such as spa baths, home brewing or home photo processing.*
- *Waste disposal units increase biological load.*
- *Laundry chemicals and toxic substances will affect the performance (See below) It is assumed that laundry is not brought in, i.e. Team strips.*

6 Commercial Premises

- Identify **ALL** the sources of waste.
- Identify final maximum site usage/business expectations.
- The individual values provided for each function within the table assume that 100% of every application and load is quantified. **DO NOT** reduce values based on reduced expectations.
- All catering applications require the installation of adequately sized grease separators, removal or retention systems up-stream of the biological treatment equipment.

7 Catering premises

- Establish maximum (and minimum) daily load based on a 24 hour cycle.
- Check period of operation.
- Identify dates of maximum loads, e.g. Mothering Sunday, Easter, Bank holidays, Fridays etc.
- Identify load peaks, usually at lunch or evening.

- *Flow balancing may provide an appropriate solution.*
- *Where WDU and potato peelers are to be used calculate/document the load.*
- *Identify the nature(s) of the catering in order to select the correct loading, eg*

Bar snacks	- ploughmans, sandwiches, basket meals, etc.
Pre-prepared catering	- frozen and chilled meals (not prepared on site).
Home cooked meals	- fresh soups, fresh vegetables, casseroles, etc.
Luxury catering	- fully prepared on site with cream sauces, home made desserts.
Takeaways	- Indian, Chinese, fish and chips, etc.
Fast food	- roadside restaurants, burger chains, etc.
Function room catering	- Establish "normal" style, may be sandwiches, or full buffet, home cooked meals, conference, wedding banquets, etc.

- *The biological unit must be protected from grease and fats. Modern cooking uses light oils, which may not separate. The collection and containment of all forms of grease prior to the biological equipment is vital. Operate any grease system in full accordance with the manufacturer's instructions.*
- *Individual kitchen practices affect loads, i.e. leftovers on plates may be scraped into bins, or wet rinsed into system, the former to be encouraged, the latter should be discouraged or factored into the treatment plant design.*
- *Premises serving beers may produce toxic caustic effluents due to the hygiene and cleaning regimes.*
- *The proportion of wastes from some sources can produce an effluent, which is difficult to treat, e.g. some Drive Through Fast Food establishments can have an effluent with a low organic content.*

8 Hotels & Residential Centres

- Establish "style and type" of hotel e.g. Prestige (5^{M}), Bedroom only accommodation, Conference Centres, Resort Hotels with Sports and Spas, Treatment Centres, etc.
- Calculate total loading based on occupancy of at least 2 people per room.

- *Some hotels regularly have 4 occupants per room.*

Consider and add other hotel activities and waste functions.

The volume/BOD figures are based on an expectation that guests have an evening meal, drink and breakfast and that good kitchen practices are in place.

- Add all other loads, considering non-resident uses, ie Lunches, Functions, Visiting Drinkers, Diners, etc.
- Consider periodicity of loads.
- Ensure residential and training centre loadings reflect the complete meal plan, i.e. allow for lunch and afternoon tea, sports, etc.
- Special Events. Check provision of temporary facilities, e.g. summer marquees and allow for appropriate loading.
- Consider any loads from outside catering.

9 Laundries

- Excepting domestic premises, it is assumed that all laundry functions are additional.
- For each premises, identify which laundry items are done in house or sent off site.
- Calculate the laundry load on the basis of the number of machines and the period of use.
- Sites with laundries must fit and maintain lint filters.

The chemical load (detergents) inhibits biological treatment, the laundry waste percentage of the normal maximum Flow usually needs to be less than 30% of the total load.

Where the laundry percentage >30%, manufacturers select equipment on a different basis.

As a guide, where the hydraulic load from laundries is between 1-10%, system size increases by 10%, 11-20% increases by 20%, 21-30% increases by 30%.

Excess/surplus detergents (above the recommended quantities) can affect the biological process.

Discharge quality may be improved if operators use low/zero phosphate detergents.

10 Toilet Blocks

Figures can also be assessed according to the sanitary equipment and control system installed.

Automatically flushed urinals use 10 litres per hour; a single flush should not use more than 1.5 litres.

Consider ladies and gents toilet facilities separately.

11 Sports Clubs

- Calculate loadings on 100% usage for the sporting facility. The figure provided includes showering and toilet use by the sports person.
- Consider also the non-sporting uses, i.e. spectators' toilet use.
- Add drinkers, social members and staff.
- Add values for catering facilities.
- Check normal and exceptional catering provisions.
- A swimming pool with no associated sports centre may be calculated using the number of swimmers, assume a toilet use per person, and by adding values for showers and spectators. Check duration of visits and modify for extended use.

Consider separate treatment or disposal of backwash waters from ancillary equipment, such as types of filtration and disinfectant removal in swimming pools.

12 Golf Clubs

- The values within the data table allow for light snacks and toilet use.
- Calculate additional allowances for showers.
- Add values for other catering facilities (if other than light snacks).

13 Hospitals

- The nature of the facility affects the design values. Some nursing homes have very high hydraulic loads as a result of the use of bedpans and their sanitation. Consider any disinfection equipment installed.
- With drugs and hygiene requirements of hospitals adjust the equipment size to compensate for treatability factors.

Disposal of unused/waste medicines is not permitted via the treatment facility.

14 Caravan Sites

- Establish nature of communal blocks, i.e. toilet, shower usage, laundry, etc.
- Where laundry equipment is installed, count the number of machines on site and period of use. Where possible, identify specific commercial machine details for volume and wash cycle duration.

Hydraulic loads of 100 litres per hour for 12 hours are not unusual.

- Loading figures quoted assume that wastes from chemical toilets do not enter the system as they must not be allowed to enter into the treatment plant.

A cesspool may be installed to receive chemical toilet waste for separate disposal.

15 Installation

The following may affect which equipment is offered.

- The site.
- Location of treatment plant within the site.
- Invert depth of installation (where possible, locate to permit gravity flow into and out of the system).
- Pumping equipment.
- Installation requirements.

Refer to manufacturer's specifications and installation manual.

- Access for maintenance and servicing.

Refer to manufacturer's specifications and maintenance instructions.

- The need for a sample chamber.
- Discharge point.
- Soil percolation area or other tertiary treatment.

16 Documentation

Records of the loads used to select and recommend the type and size of treatment systems should be maintained by the specifier and the customer. A typical example follows.

Treatment system enquiry sizing sheet

Our Ref. 123456 **Date** 10th August 2003 **Site** ABC Hotel 3* Hotel **Client** New Architects & Consultants

SOURCE OF WASTE				FLOW LITRE / DAY		BOD GRAMS / DAY		NH_4	
Description	No of rooms	Occupancy	No	Per Head	TOTAL	Per Head	TOTAL	Per Head	TOTAL
Rooms	80	2	160	250	40000	94	15040	10	1600
Bar drinkers			120	12	1440	15	1800	5	600
Non resident luxury meals			150	30	4500	38	5700	4	600
Staff, full-time day staff			30	90	2700	38	1140	5	150
Staff, part-time			20	45	900	25	500	3	60
Laundry – all sent off site									
Domestic washing machine for tea towels only				800					
Total load(s)					**50340**		**24180**		**3010**
Effluent quality requested					20 mg/l BOD		30 mg/l SS		20 mg/l NH_4 N

Suggested type of plant: XYZ. **Invert:** 1.0m. **Power:** 3-phase. **Surface water:** all to be excluded from foul sewer. **Consent to discharge:** to be obtained from the Regulator. **Waste Disposal Units:** assumed that none are fitted.
Grease trap: required size "125".

Notes

Swimming pool – present, used for guests only, all backwash wastes to be excluded. No function rooms or catering

Further information and guidance can be obtained from the British Water website – **www.britishwater.co.uk**

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Water Management Solutions

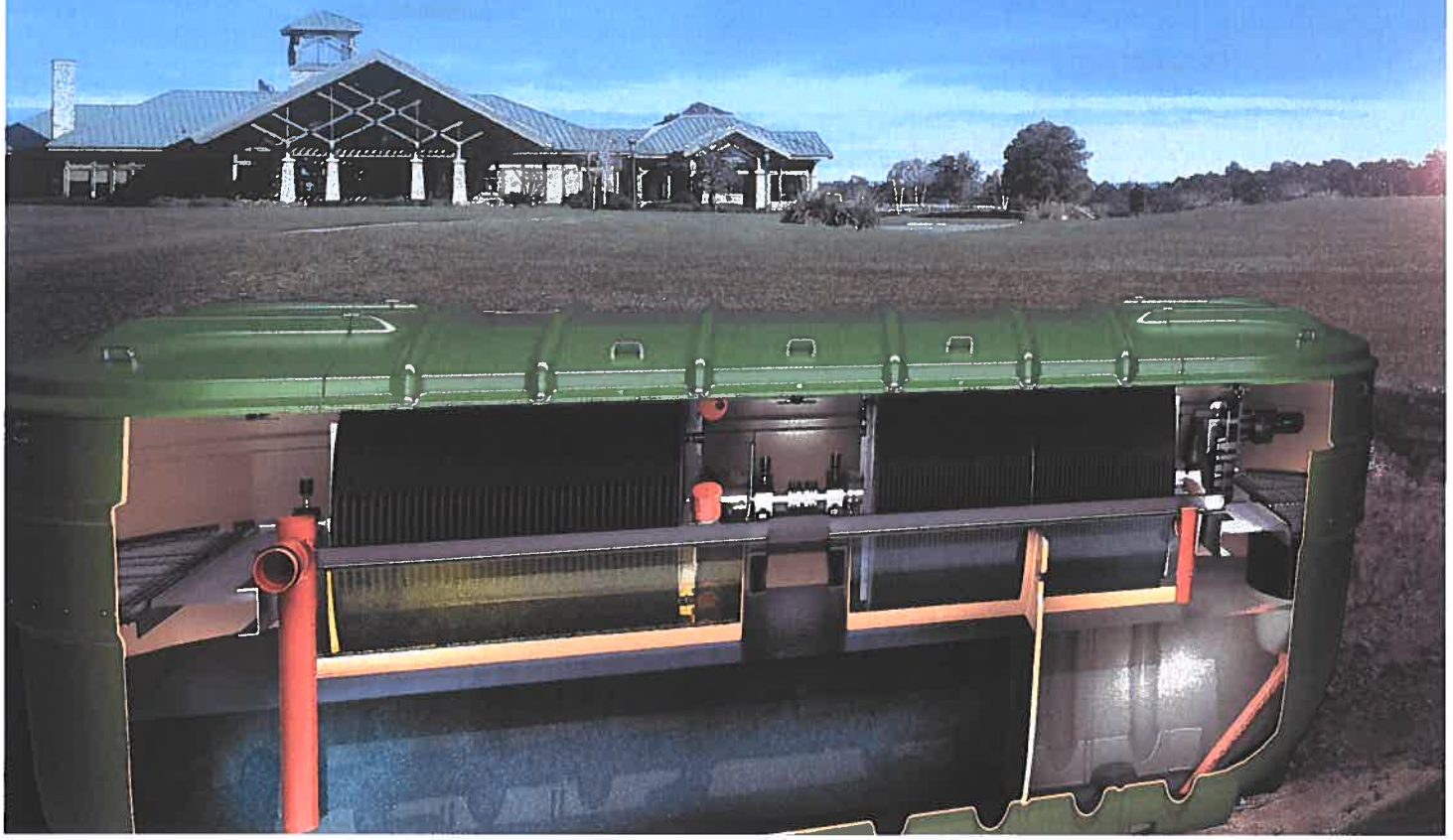
Kingspan

3 YR WARRANTY PERIOD

Klargester

BioDisc® BD-BN Sewage Treatment Plant

Reliable wastewater treatment solutions for a range of large applications



kingspan.co.uk/klargester

Kingspan

Why choose a Large BioDisc®?

With strict Environment Agency standards, it's more important than ever to choose a sewage treatment plant that delivers peace of mind with reliable treatment of wastewater.

Kingspan Klargester has 70 years' experience in the design and manufacture of water management solutions. The Kingspan Klargester BioDisc large treatment plant offers the following benefits:

70 YEARS' EXPERIENCE

*Subject to regular maintenance by either Kingspan Service or a Kingspan Klargester Accredited Installer and Service Partner. Online registration required.

Affordable lifetime running costs

Delivered as a single, packaged system, the Kingspan Klargester BioDisc RBC range offers affordable running costs due to its unique design and operational efficiencies. A manual air blower system is not required to power the commercial BioDisc, as it instead relies on the rotating biological disc which drives the wastewater treatment process in a highly efficient way.

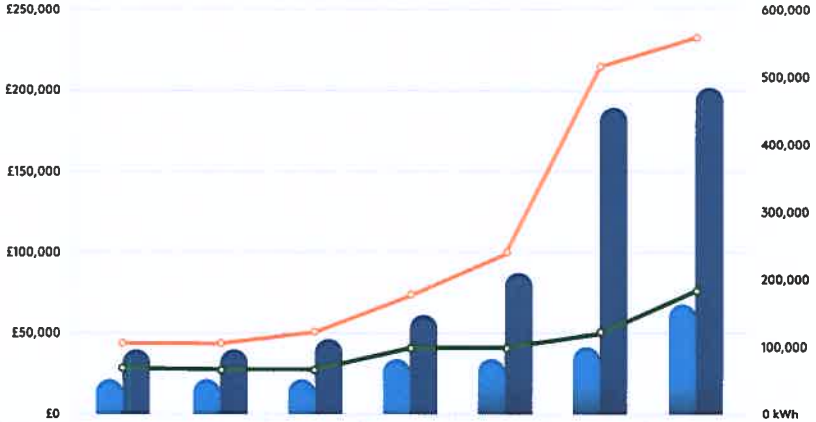
Our range of large treatment plants is designed to run from either a single phase or three phase power source, and require 60 to 550 watt motors, offering low running costs.

LOW ENERGY

Save up to 67% on energy and cost savings

Large BioDisc (RBC) versus an aerated system

Based on total energy costs over 20 year minimum expected product lifetime.**



Max. Daily Flow (m³/per day)	14	15	20	25	30	45	60
20 Years BioDisc	£23,976	£21,155	£21,155	£33,144	£33,144	£39,490	£66,287
20 Years Aerated System*	£36,179	£36,179	£42,311	£58,254	£82,782	£180,894	£202,356
BioDisc kWh	68,504	60,444	60,444	94,696	94,696	112,828	189,392
Aerated System kWh*	103,368	103,368	120,888	166,440	236,520	516,840	578,160

*Based on Klargester BioFicient Aerated System

To find out more about the cost benefits of choosing the Kingspan Klargester BioDisc, contact our in-house technical team who are happy to provide guidance on the size and cost of model for your wastewater project.

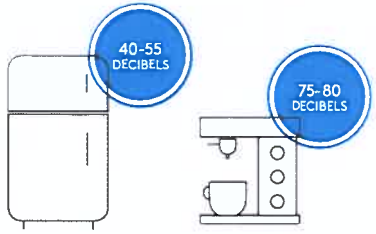
Email: klargester@kingspan.com
Tel: (0) 1296 633 033
Web: www.kingspan.co.uk/klargester

* Based on 20 years running costs of BioDisc BN model versus an aerated treatment plant.
**Cost calculations based on £0.269p per kw/H.

Low Noise

In contrast with a noisy aerated wastewater treatment system, the Kingspan Klargester large BioDisc delivers a low noise day to day operation. Whereas an aerated system creates constant noise, the discs of the BioDisc revolve quietly. At a recent site, our expert team concluded that commercial BioDisc has the same level of noise as the average ambient background noise outside – between 40-55 decibels.

LOW NOISE



Commercial BioDisc
Decibel equivalent to a modern refrigerator

Typical aerated system
Decibel equivalent to a coffee grinder machine

Odourless operation

Kingspan Klargester's large BioDisc uses the tried and tested Rotating Biological Contactor technology. This means that it utilises moving discs containing living biomass and a flow management system to treat the wastewater, as opposed to an air pump which is used in a traditional aerated system.

ODOUR FREE

BioDisc is one of the few sewage treatment systems available in the UK that does not make use of an air pump. This means minimal odour being omitted as effluent is not aerated or 'blown around' within a system.

This is verified by an independent odour sampling report undertaken at one of our sites in Cumbria, in partnership with H+M Environmental Ltd (April 2017) and in accordance with EN13725 test standards.

The key findings of the report stated:

'No odour was subjectively discernible at the site boundary fence, or within the BioDisc compound'.

- The odour emission rate was calculated by sampling the odour concentration from joins in the unit covers. This was then multiplied by a volumetric air flow.
- Weather conditions were dry and sunny during the sampling.
- Temperatures on the day of sample (18th April) ranged from 8-12ºC during the test period.
- The BioDisc operated normally during the sampling with no particular reported operational issues.

Tested in accordance with EN13725 standards

Calculated Odour Emmissions Rates

Source	Measured Odour Concentration	Measured Air Flow	Calculated Odour Emission
	ou/m³	m³/s	ou/s
Air vented from BioDisc 9am	350	0.008	2.7
Air vented from BioDisc 11am	339	0.008	2.7

(Above: extract showing actual calculated Odour Emission Rates from sample report – April 2017. Full report available on request from Kingspan Klargester).

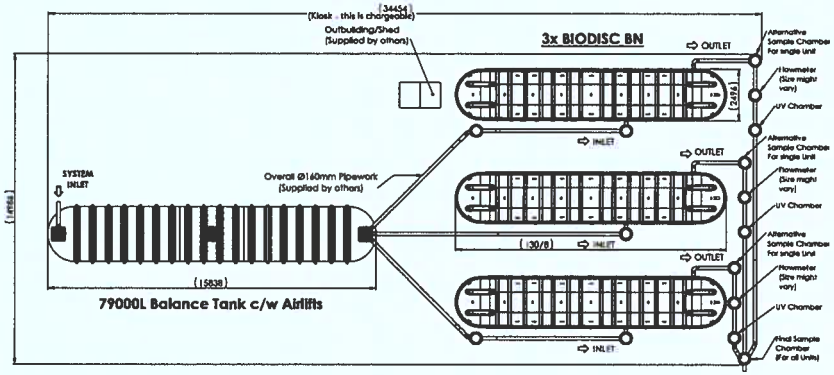
A professional partnership

Kingspan Klargester provides relevant advice and support throughout the wastewater treatment purchasing process based on our in-depth local knowledge and expertise. How? By offering comprehensive free site visits, professional installation options and expert aftersales care through our in-house Service team and our national network of Kingspan Klargester accredited installers and service partners.

Our expert team provides:

- Free on-site consultations, including sizing advice and full engineering expertise
- A smart commissioning solution which includes our SmartServ Pro remote monitoring software, for total peace of mind (optional extra)
- Professional installation
- Preventative maintenance plans to ensure optimal ongoing performance
- Day to day technical support
- Consultancy and advice, direct from the manufacturer
- A 3 year warranty period (when you register your warranty online). Terms and conditions apply - view online at https://www.kingspan.com/gb/en-gb/products/wastewater-management/warranty-terms

As part of our free site visit service, we can offer advice on larger bespoke schemes.



Talk to us about larger bespoke schemes, at klargester@kingspan.com

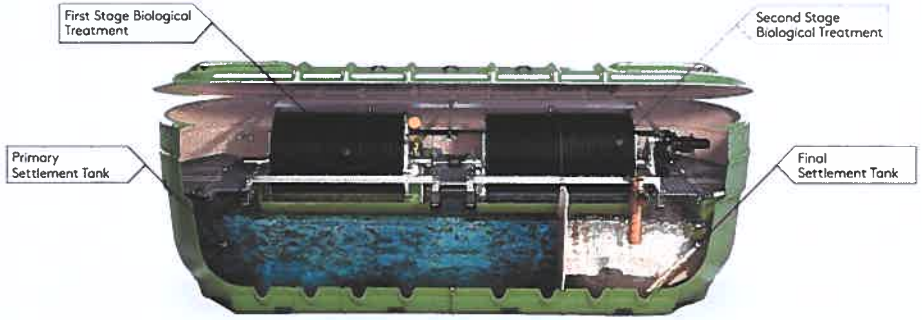
Technical specifications
How it works

Our flow management systems ensure optimum treatment performance in the treatment zones. BioDisc features two chambers to ensure a totally efficient operation with a unique flow balancing facility.

This managed flow system ensures peak performance by smoothing variable loads. Wastewater is moved at a controlled rate through the sections with the entire media area available, ensuring maximum treatment efficiency.

Performance & Compliance
- Odour free - independently tested in accordance with EN 13725.
- Designed for applications selected in compliance with British Water Code of Practice Flows and Loads.

The Large BioDisc Wastewater Management Process



01

Primary Settlement Tank

This is the initial stage of treatment and simply involves the retention of coarse solids present in raw sewage and wastewater for subsequent gradual breakdown.

02

First Stage Biological Treatment

The liquor and fine solids then flow into the first stage of Biological Treatment. A unique managed flow system ensures peak performance by smoothing variable loads.

03

Second Stage Biological Treatment

The liquor is then fed forward at a controlled rate into Biological Treatment stage 2 for further treatment. This process ensures the whole media area available is utilised ensuring maximum efficiency.

04

Final Settlement Tank

The surplus micro-organisms continuously slough off the discs and are carried forward to the final settlement where they settle out as a humus sludge, leaving a clear treated effluent to be discharged to ground or water course.

Technical Specifications

Model Reference	BD	BE	BF	BG	BJ	BK	BL	BM	BN
PE	25	35	50						
Maximum Daily BOD (kg)				4.2	6	7.5	9	13.5	18
Maximum Daily Flow (m3)				14	20	25	30	45	60
Ø/Width (mm)	2450	2450	2450	2450	2450	2450	2450	2450	2450
Length (mm)	3340	3340	4345	5235	7755	7755	7755	10420	13100
Inlet invert depth (mm)	600/1100	600/1100	600/1100	600/1100	600/1000	600/1000	600/1000	600/1000	600/1000
Depth Below Inlet Invert (mm)	1820	1820	1820	1820	1790	1790	1790	1790	1790
Outlet Invert Depth (mm)	1735	1735	1720	700/1200	750/1150	750/1150	750/1150	750/1150	750/1150
Overall Height (mm)	2825/3325	2825/3325	2825/3325	2825/3325	2830/3230	2830/3230	2830/3230	2830/3230	2830/3230
Height to Rim of Cover (mm)	2485/2985	2485/2985	2485/2985	2485/2985	2490/2890	2490/2890	2490/2890	2490/2890	2490/2890
Empty Weight (kg)	1100/1200	1200/1300	1315/1465	1660/1810	3100/3120	3200/3220	3300/3320	4700/4750	5500/5650
Standard Power Supply	1 Phase	1 Phase	1 Phase	1 phase	1 phase	1 phase	1 phase	1 phase	1 phase
Motor Rating – 1 Phase (Watts)	253	253	299	180	250	370	370	550	2 x 370
Full Load Current 1 Phase (amps)	1.1	1.1	1.3	1.6	1.5	2.35	2.35	2.8	2 x 2.35
Optional Power Supply	3 Phase	3 Phase	3 Phase	3 phase	3 phase	3 phase	3 phase	3 phase	3 phase
Motor Rating – 3 Phase (Watts)	90	90	250	180	250	370	370	550	2 x 370
Full Load Current 3 Phase (amps)	0.58	0.58	0.42	0.63	0.88	1.55	1.55	2.8	2 x 1.35
Sludge Return Pump Rating (Watts)	250	250	250	250	250	250	250	250	250

Protect your investment with our Smart Commissioning Package

This comprehensive package* includes commissioning, to ensure your commercial BioDisc runs optimally right from the start, as well as our remote monitoring solution – SmartServ Pro. Together, both provide total peace of mind when it comes to the ongoing performance of your wastewater treatment solution. Remember that installation of a suitable alarm system is required under EN 12566-3 (BioDisc BE-BF units only).

For information on our Smart Commissioning Package or wider service solutions, contact our team on helpingyou@kingspan.com or visit our website at kingspanservice.com

Register your warranty online by scanning the QR code below to enjoy an extended 3 year warranty period**

3 YR WARRANTY PERIOD

**Terms and conditions apply. Visit: https://www.kingspan.com/gb/en-gb/products/wastewater-management/warranty-terms

* Available as an optional extra.

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Corran Ferry Infrastructure Improvement Scheme

Appendix I.2: Corran Narrows Tidal Current Profiling Data Report

Corran Narrows Tidal Current Profiling

Data Report

Aspect Surveys | 7 September 2022

Document Control

Document information

Project Title	Corran Narrows Tidal Current Profiling
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Issue Number	v01
Issue Status	Final

Revision History

Issue	Date	Status	Comments on Content	Prepared By	Checked By	Approved By
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Recipient	Distribution Method		
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Graeme Thomson, Aspect Surveys Ltd		X	

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Abbreviations

ADCP	Acoustic Doppler Current Profiler
GPS	Global Positioning System
RTK	Real-time Kinematic Positioning
WGS 84	World Geodetic System 1984 (Lat° Long°)

Executive Summary

Partrac have been contracted by Aspect Surveys to collect tidal Current data in the Corran Narrows in Loch Linnhe, south of Fort William, Scotland. The data is to be used to calibrate the tidal current model being used for the development of the ferry terminal there.

This report describes the current data collected at the site between 12th July and 24th August 2022, and the RTK levelling surveys conducted during deployment and recovery.

Table 1: *Signature* data return summary.

Instrument	Reporting Start Time	Reporting End Time	Reporting Period (days)	Expected Samples	Passed QC	Passed QC (%)
Signature	2022-07-12 16:50:00	2022-08-24 10:10:00	42.7	6153	6153	100

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1. INTRODUCTION

1.1 Background

Partrac have been contracted by Aspect Surveys to collect tidal Current data in the Corran Narrows in Loch Linnhe, south of Fort William, Scotland. The data is to be used to calibrate the tidal current model being used for the development of the ferry terminal there.

This report describes the current data collected at the site between 12th July and 24th August 2022, and the RTK levelling surveys conducted during deployment and recovery.

1.2 Scope of Works

A Nortek 500 kHz *Signature* ADCP was deployed in the Corran Narrows on 12th July 2022 and collected data for 42 days. The deployment locations for the frame and mooring instruments are indicated in Table 2 and the location of the frame is shown in Figure 1.

The instrument was recovered on 24th August 2022.

Table 2: Deployment locations of instrumentation and mooring.

Site Name	Instruments	WGS84		Depth (m cd)
		Latitude	Longitude	
Corran	*Signature* 500 (serial 102239)	56°43.447'N	005°14.186'W	c. 30 m
	Sonardyne T6 acoustic release	56°43.418'N	005°14.177'W	c. 20 m

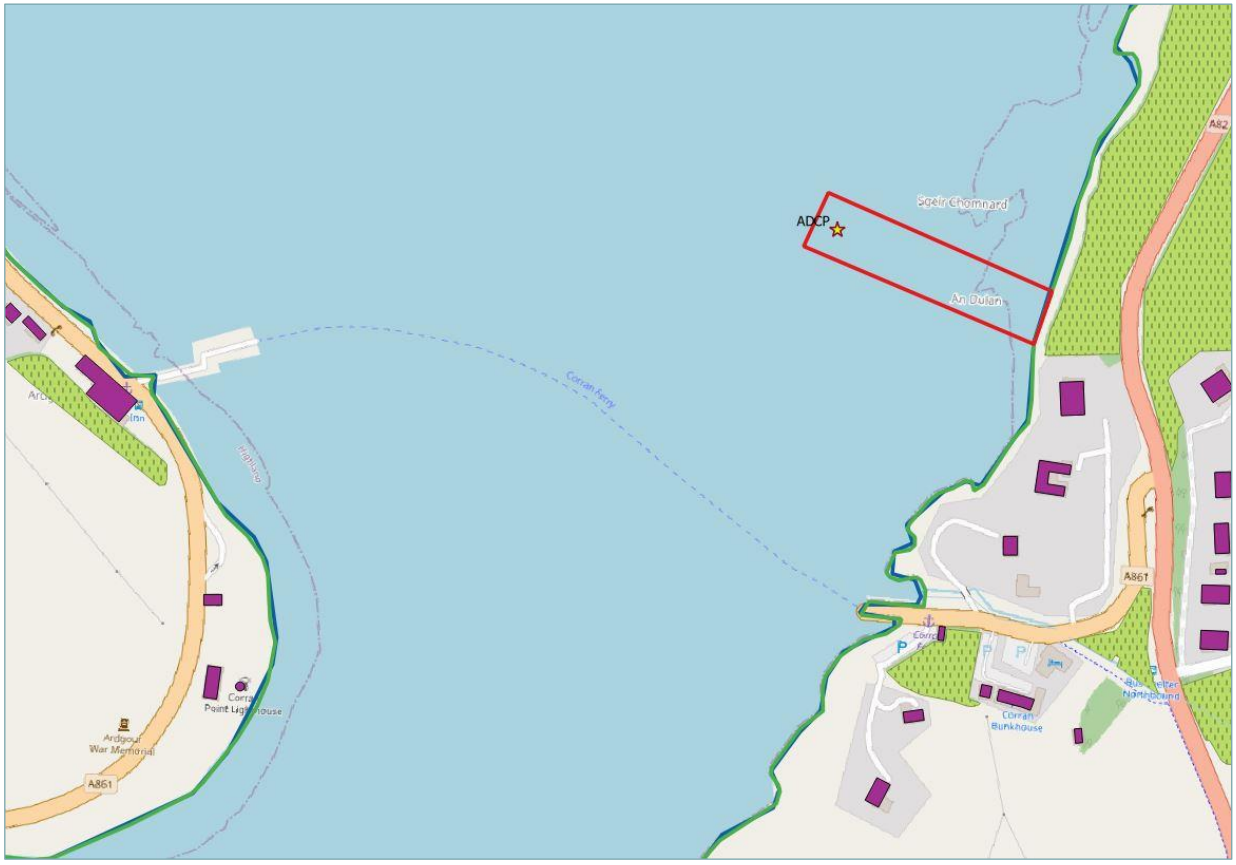

Figure 1: Position map of the target frame location.

At the deployment and recovery of the instrument, a series of observations of the local sea surface elevation, referenced to Ordnance Datum (Newlyn), were taken using a GPS/RTK receiver. These observations have been used to reference the ADCP water level record to the same datum.

2. QUALITY CONTROL AND DATA PROCESSING

2.1 *Signature* ADCP Current Data Analysis

Partrac has developed a system for processing ADCP currents. Firstly, the raw data are post-processed using the NORTEK utility *SignatureWaves* and exported to an ASCII format. Partrac's bespoke MATLAB© routines then import all data and identifies (flags) any large changes in current magnitude occurring for consecutive records, as shown in Table 3. These data are investigated further to determine if flagged data are anomalous (outliers) and therefore to be removed from the dataset. Data adjacent to flagged data may also be removed. A further manual inspection is made for otherwise anomalous data.

Table 3: Current data quality control check.

Parameter	Units	Maximum Change Per Sample
Current magnitude	$m.s^{-1}$	0.8

The *Signature* water depth data has been referenced to Ordnance Datum (Newlyn) as recorded by the RTK levelling surveys.

2.2 RTK tidal elevation data.

The RTK tidal elevation surveys were completed at deployment and recovery, whilst the ADCP was deployed. A Trimble RTK was used with the VRSnow Virtual Referencing System to measure the water level with reference to Ordinance Datum (Newlyn).

The tidal height evolutions of the RTK elevation observations have been compared to the tidal height evolutions of the ADCP records for the respective levelling surveys.

3. RESULTS

3.1 *Signature* Data Summary

Current data collection was generally good except in the bottom-most sampling bin where acoustic contamination (ringing) is experienced and consequently screened out by the *SignatureWaves* software. Such 'ringing' is anticipated and a known response of these instruments currently under review by Nortek, the instrument manufacturer.

The data return statistics for the ADCP are given in Table 4 and the summary parameter statistics are given in Table 5.

Table 4: *Signature* data return summary.

Instrument	Reporting Start Time	Reporting End Time	Expected Samples	Received Samples	Recovery (%)	Passed QC	Passed QC (%)
Signature	2022-07-12 16:50:00	2022-08-24 10:10:00	6153	6153	100	6153	100

Table 5: *Signature* summary parameter statistics.

Site	Instrument	Minimum	Mean	Maximum	StDev	Unit
Corran	Current magnitude, all bins	0.00	0.67	2.85	0.56	$m\ s^{-1}$
	Depth-mean current magnitude	0.03	0.66	2.70	0.55	$m\ s^{-1}$
	Tidal elevation	-1.77	0.36	2.49	0.91	m

3.2 *Signature* Surface Elevation and Current Data

All data records were logged by the sensor. 17 records show a change in velocity magnitude greater than 0.8 ms^{-1}, and all these records have been retained after investigation.

Quality controlled sea surface elevation and current data are presented in Figure 2 to Figure 9 as follows:

- Time series plot of sea surface elevation and RTK levelling observations, referenced to ODN;
- Time series plot of total water depth;
- Contour plots of velocity magnitude and direction;
- Time series plots of estimated depth-mean velocity magnitude and direction;
- Joint occurrence distributions of estimated depth-mean velocity magnitude and direction;
- Current rose of estimated depth-mean velocity magnitude and direction.

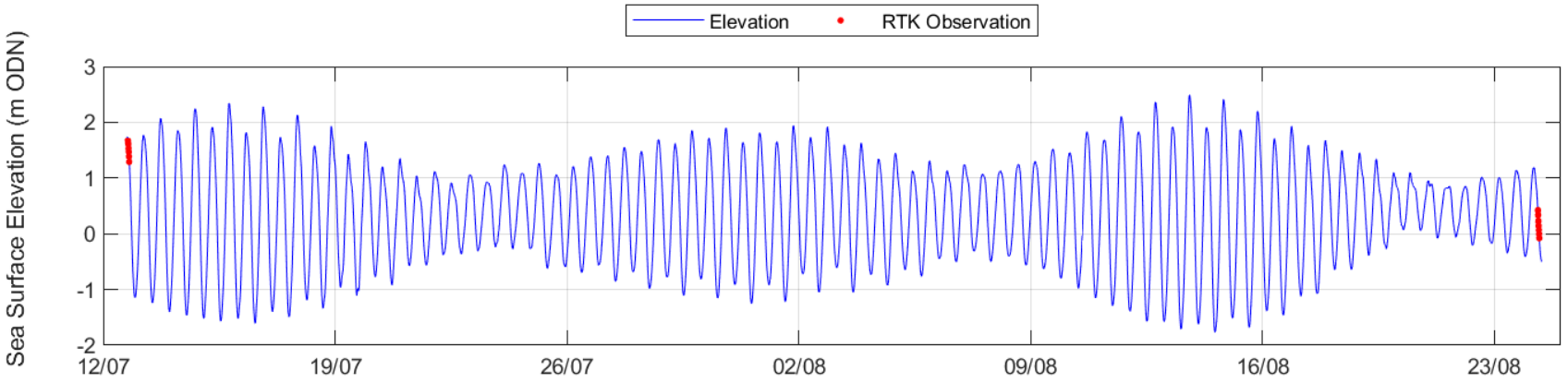

Figure 2: *Signature* surface elevation time-series and period of the RTK levelling observations, referenced to ODN.

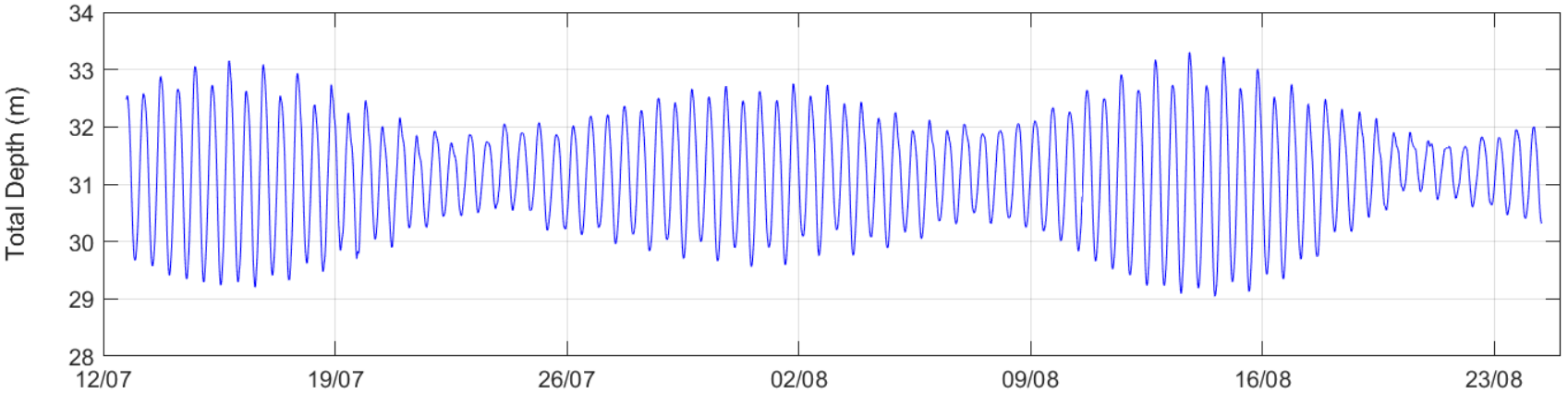

Figure 3: *Signature* total water depth time-series.

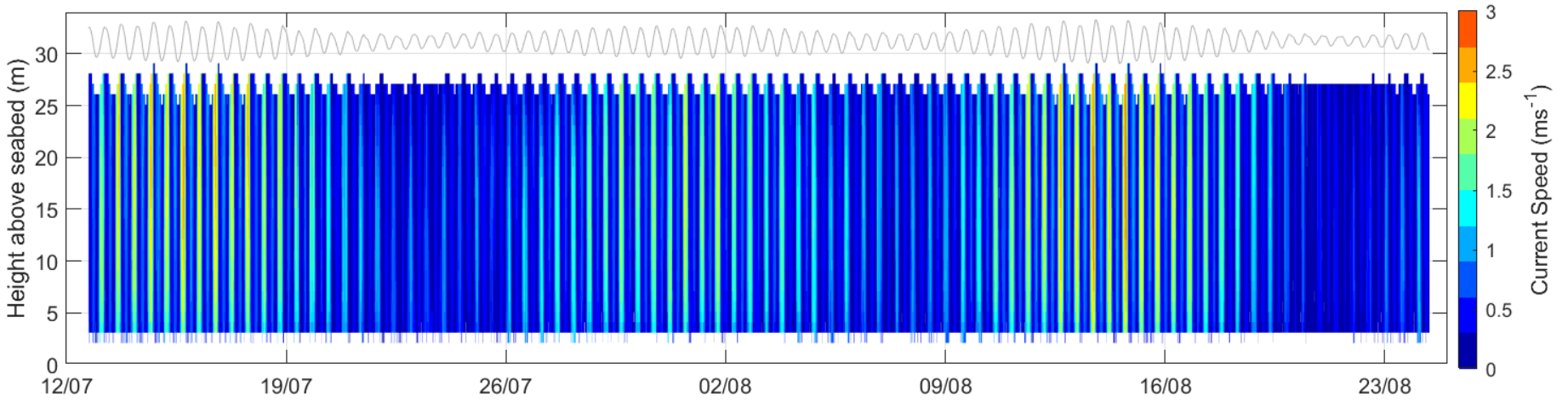

Figure 4: *Signature* velocity magnitudes.

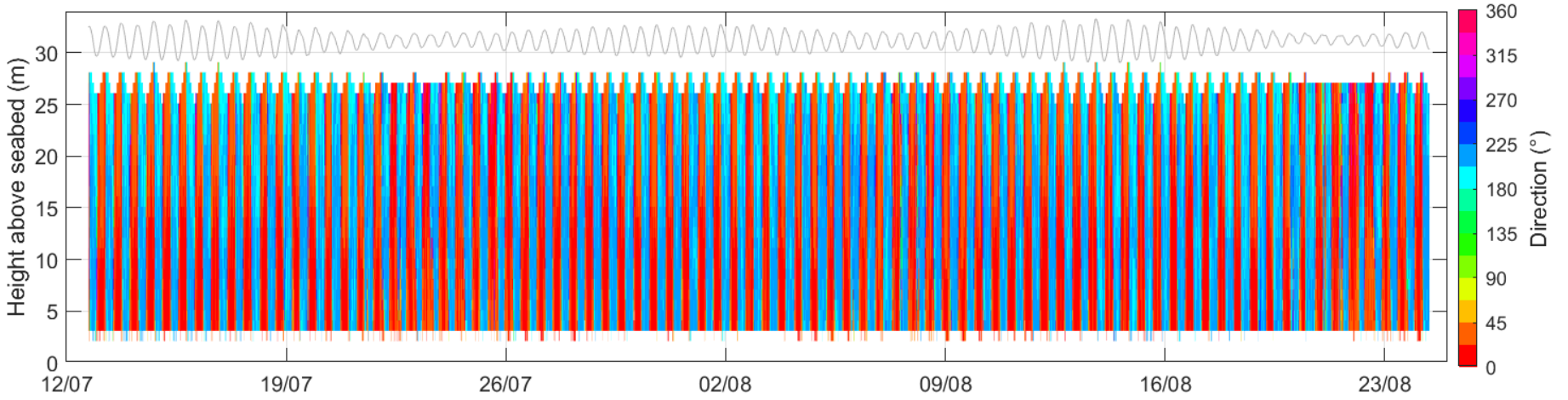

Figure 5: *Signature* velocity directions.

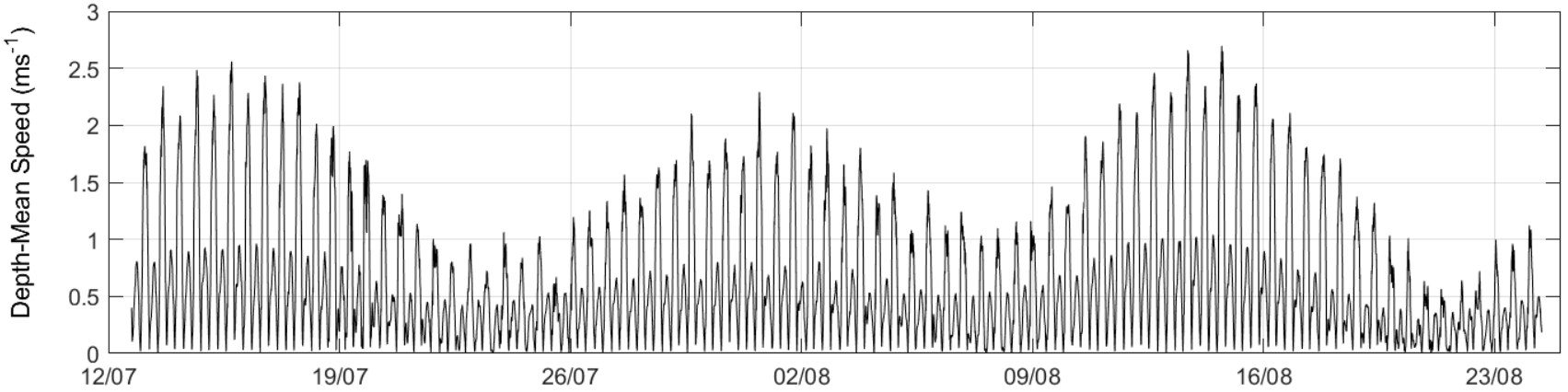

Figure 6: *Signature* depth-mean velocity magnitude.

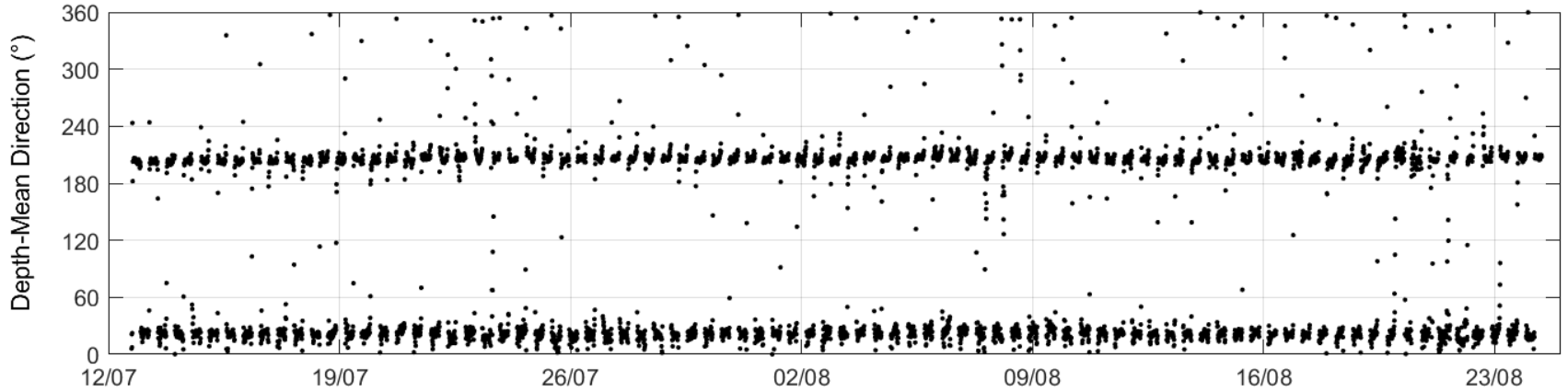

Figure 7: *Signature* depth-mean velocity direction.

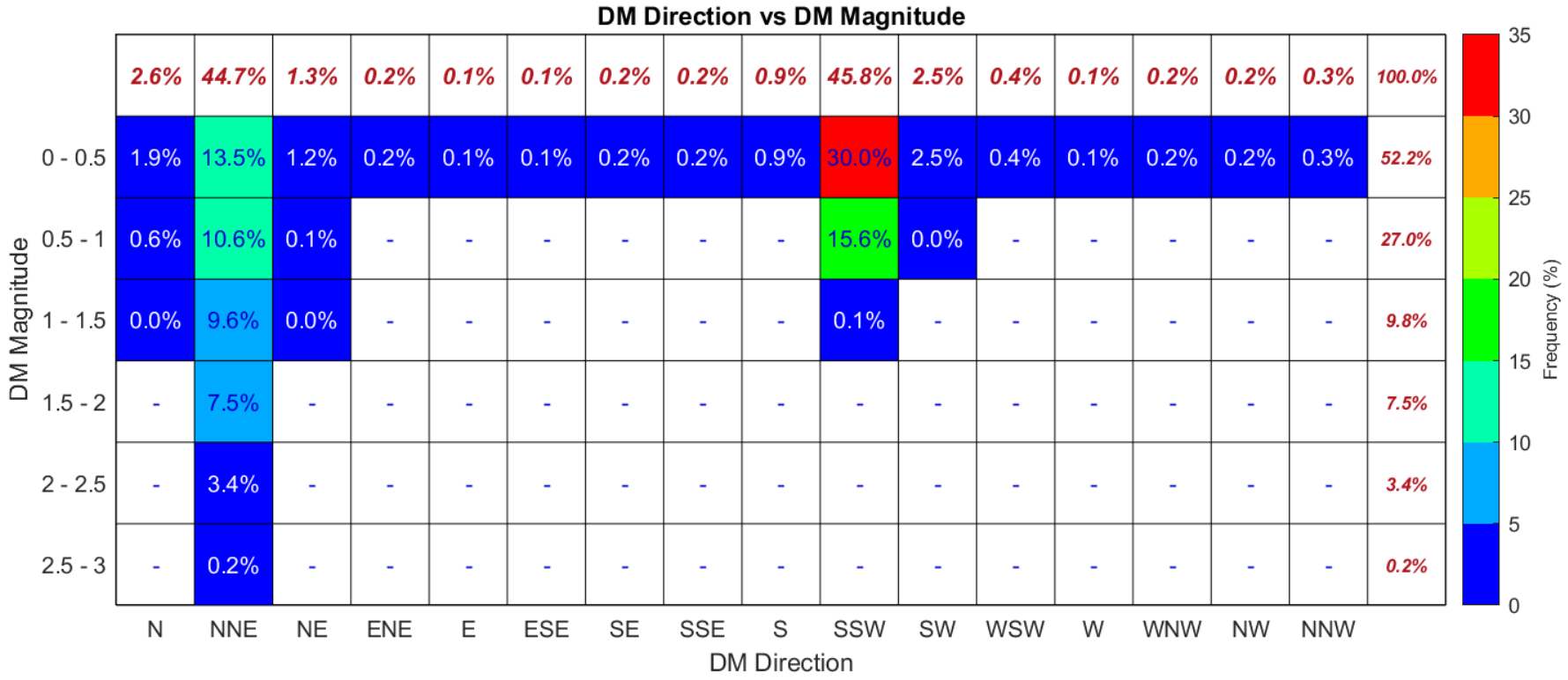

Figure 8: *Signature* velocity vs. direction occurrences.

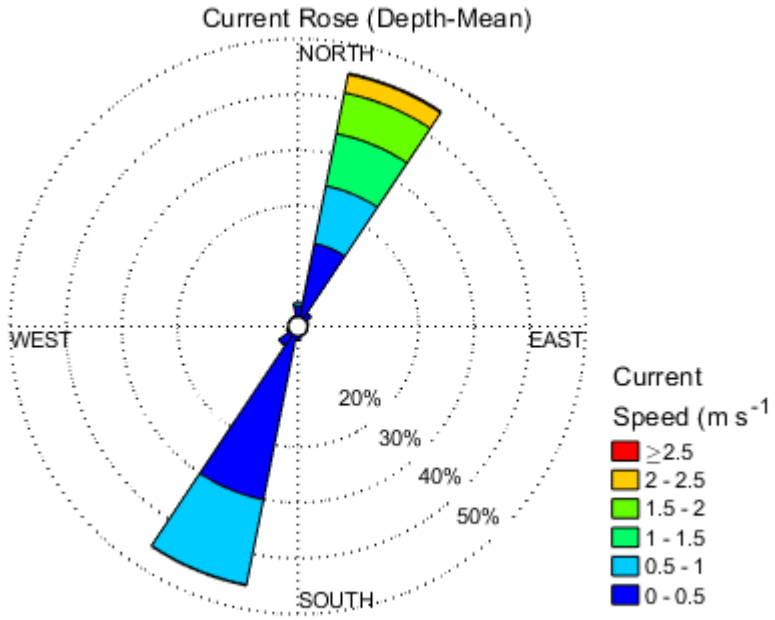

Figure 9: *Signature* depth-mean current rose.

3.3 RTK survey data

The levelling survey return for the RTK receiver are given in Table 6 and the summary parameter statistics are given in Table 5.

Table 6: RTK data return summary.

Instrument	Reporting Start Time	Reporting End Time	Recorded Samples
RTK (deployment)	2022-07-12 17:50:23	2022-07-12 18:50:14	23
RTK (recovery)	2022-08-24 07:30:04	2022-08-24 08:30:26	21

The levelling offset has been calculated as the mean difference between the interpolated water depths as recorded by the ADCP and the RTK water level observations at the same times. The net offset applied is the mean of the deployment and recovery offsets.

Table 7: RTK levelling statistics.

Site	Instrument	Minimum	Mean	Maximum	StDev	Unit
Corran	RTK Deployment levelling offset	30.79	30.83	30.85	0.016	m
	RTK Recovery levelling offset	30.77	30.80	30.82	0.015	m
	Net levelling offset	-	30.81	-	-	m

The RTK observations are indicated on Figure 2 above.

3.4 Summary of Results

In the Corran Narrows, the maximum observed current magnitude was 2.85 ms^{-1} and the maximum depth-mean current observed was 2.70 ms^{-1}.

3.5 Data Files

The data files indicated in Table 8 have been provided.

Table 8: Data files provided

Report	Instrument	Site	Filename
1	Nortek Signature 1022391	Corran	M5065.04.03.D01v01 - Corran Narrows Signature ADCP Data.xls
1	RTK	Corran	M5065.04.03.D02v01 - Corran Narrows RTK Levelling Data.xlsx

Corran Ferry Infrastructure Improvement Scheme

Appendix I.3: Corran Narrows Hydraulic Modelling Report

MAKING COMPLEX EASY

A TETRA TECH COMPANY

CORRAN NARROWS

Hydraulic Modelling Report

IBE2097

18 July 2024

rpsgroup.com

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
D01	Draft	SP	NS/KC	AKB	14/06/2024
D02	Client Review	SP	NS/KC	AKB	10/07/2024
D03	Format Update	SP	NS/KC	AKB	18/07/2024

Approval for issue

[Redacted]

Adrian Bell 18/07/2024

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1 INTRODUCTION

The Highland Council intend to redevelop the existing ferry terminals located at Corran Narrows. The Proposed Development aims to improve the service of the Ardgour – Nether Lochaber crossing on Loch Linnhe and accommodate a new electric ferry vessel. Wallace Stone LLP commissioned RPS to undertake hydraulic modelling to understand the coastal processes around the two existing ferry terminals in the Corran Narrows and to support the project design and further environmental assessments.

In particular, the modelling was required to identify potential changes to the existing coastal processes as a result of the Project. RPS has undertaken a detailed assessment to describe the study area's tidal regime, wave climate and the sediment and marine detritus transport regime, using the MIKE Modelling Software developed by the Danish Hydraulic Institute (DHI).

Each of these elements are comprehensively addressed in this report. The data, methodology and modelling techniques used are also detailed in the document.

The location of Corran Narrows and the existing ferry terminals relative to the surrounding area is illustrated in Figure 1.1.

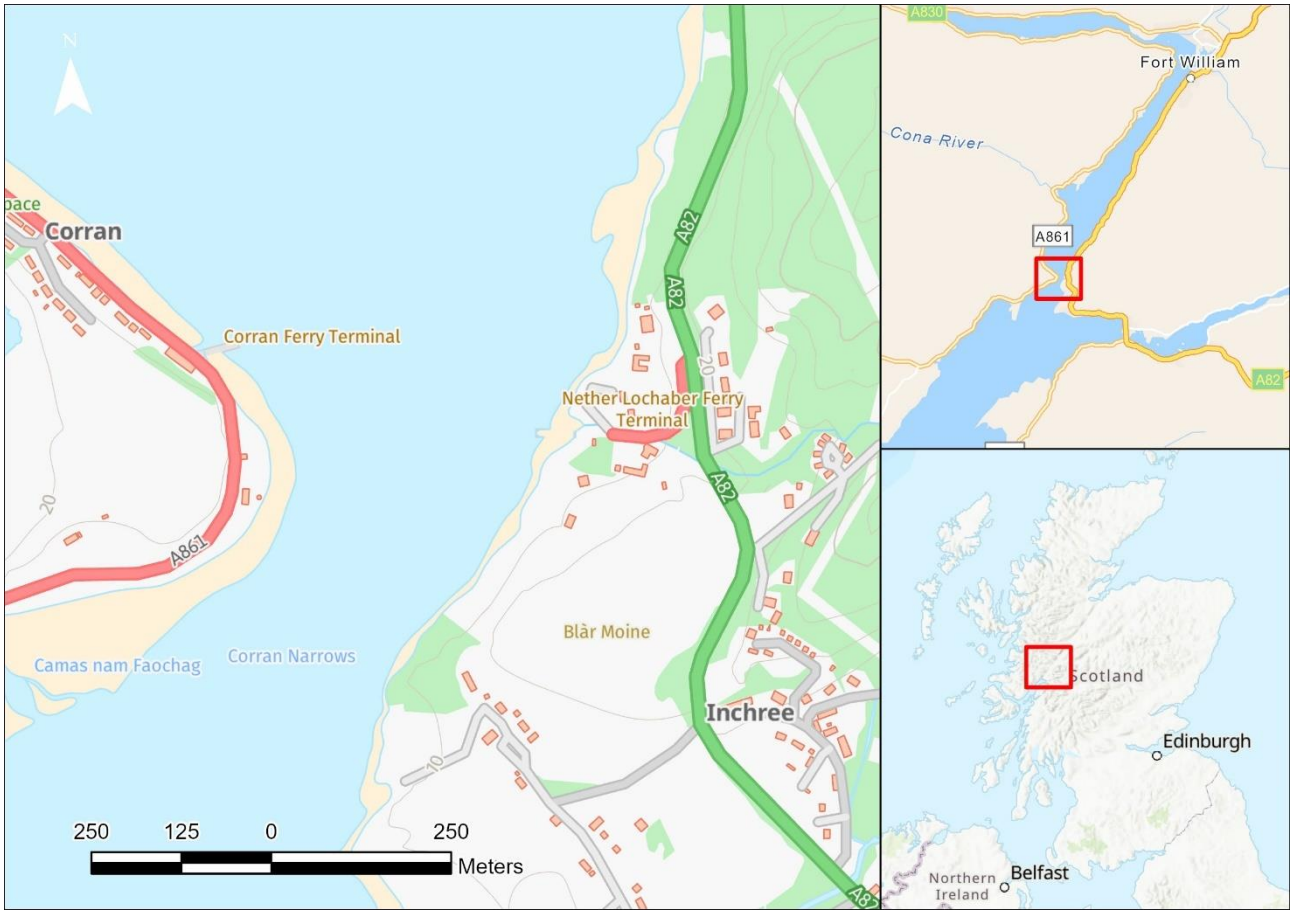

Figure 1.1: Site location map for Corran Narrows including the location of the existing ferry terminals

1.1 Site Description

The study area considered in the assessment comprises both the western and eastern banks of Loch Linnhe at the Corran Narrows, together with the stretch of water itself (Figure 1.2). Settlements in the Study Area include the villages of Ardgour, Corran, Nether Lochaber and Inchree, and their hinterlands (including Clouvillin and Keppach). In terms of the existing coastal processes and infrastructure, the Corran Narrows is a narrow channel with strong tidal currents (c. 2.5m/s at mid-stream).

The existing ferry operates across this narrow channel and utilises the existing slipways. In terms of the local topography, Loch Linnhe is surrounded by the high terrain of the Scottish Highlands, resulting in strong winds funnelling up and down the Loch. According to the Admiralty Charts, the seabed at the Corran Narrows consists generally of rocks and stones with depths up to 24m CD. Several subsea cables cross the channel to the north of the existing ferry crossing.

Figure 1.2: Aerial imagery of the Corran Narrows

2 STUDY METHODOLOGY AND DATA

RPS used the MIKE 21 hydrodynamic numerical modelling software package developed by DHI, to quantify potential coastal processes impacts / issues. This was achieved by developing a range of two-dimensional numerical models to represent:

- the pre-project scenario; and
- the post-project scenario with the proposed development in place.

These models were used in conjunction with hydrographic survey data and site-specific sediment data to assess the potential construction and operational impacts of the Proposed Development in the context of the following coastal processes:

- The tidal regime;
- The inshore wave climate;
- Littoral currents; and
- Sedimentology.

The impact of the Proposed Development on these coastal processes has generally been quantified using comparison plots throughout this report, i.e., post-project against pre-project conditions. As such, the extent of the changes as a result of the Proposed Development could be identified and compared against baseline conditions, and ultimately used in future environmental assessments.

The general methodology involved obtaining wind data that was used to undertake extreme value analyses and produce boundary conditions for a range of numerical models. These models were then used to derive the wave climate at Corran Narrows for appropriate return period events. This inshore wave climate data was then used to assess the hydraulic performance of the proposed breakwater and berthing infrastructure. More information on each of these steps is presented in the following Sections of this report.

2.1 Standard and Extreme Water Levels

The normal astronomical tidal levels for the study area were derived using the data presented for Corran in the Admiralty Tide Tables for 2024. The resulting standard water levels for Corran are presented in Table 2.1. The published extreme water levels calculated as part of the UK Coastal Flood Boundary Extreme Sea Levels (Environment Agency, 2018) are also presented in Table 2.2.

Table 2.1: Tidal levels at Corran relative to Chart Datum and Mean Sea Level

Phase	Chart Datum [m]	Mean Sea Level [m]
Highest Astronomical Tide	4.90	2.94
Mean High Water Spring	4.4	2.44
Mean High Water Neap	3.3	1.34
Mean Low Water Neap	1.7	-0.26
Mean Low Water Spring	0.7	-1.26

Table 2.2: Extreme water levels in Loch Linnhe

Return Period	Chart Datum [m]	Mean Sea Level [m]
1 in 2	5.02	3.06
1 in 5	5.18	3.22
1 in 10	5.30	3.34
1 in 20	5.43	3.47
1 in 50	5.60	3.64
1 in 100	5.74	3.78
1 in 200	5.88	3.92
1 in 1000	6.23	4.27

2.2 Wind Data

Climate Forecast System Reanalysis (CFSR) wind data was used to evaluate wind speeds for the study area. As anticipated, the wind data was predominantly from the southwest sector as shown in Figure 2.1. The outputs from an Extreme Value Analysis (EVA) analysis of wind are shown in Table 2.3. To verify wind speeds from the CFSR (which was derived from a land point and not factored for over water wind speeds), wind speeds were calculated and factored using the EN 1991-1-4:2005+A1:2010 method to account for over-water wind speeds across the Loch. For the longer fetches running the length of Loch Linnhe which experience wind funnelling due to the topography, the wind speeds were increased by 30% to reach full overwater wind speeds.

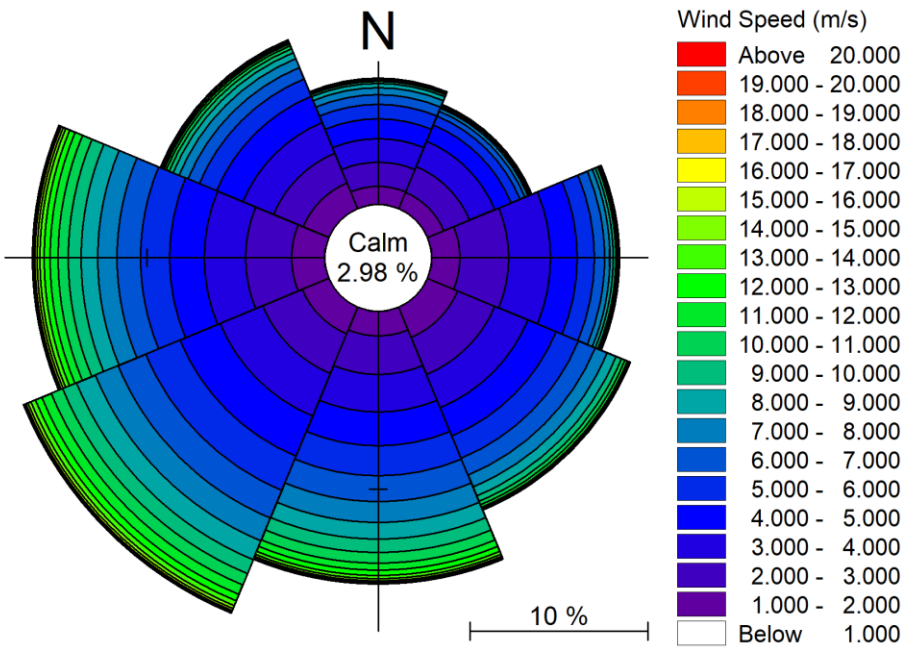

Figure 2.1: Wind rose for the raw wind data based on data from 1979 - 2022

Table 2.3: Output from the EVA of the CFSR wind data which were used for wind wave generation

Storm Direction°	Fetch Length	Factor	1 in 0.1 (m/s)	1 in 1 (m/s)	1 in 10 (m/s)	1 in 50 (m/s)	1 in 100 (m/s)
0	7.40	1.16	13.21	18.71	22.42	24.98	26.26
15	10.70	1.17	13.07	18.52	22.20	24.73	25.99
35	10.00	1.30	14.38	20.37	24.42	27.21	28.60
45	3.70	1.17	13.18	18.55	22.16	24.64	25.88
135	0.73	1.04	12.50	17.63	21.09	23.46	24.65
150	0.80	1.05	12.99	18.32	21.91	24.38	25.61
165	1.00	1.06	13.36	18.84	22.53	25.06	26.33
180	1.90	1.09	13.95	19.64	23.48	26.11	27.43
195	2.14	1.09	14.50	20.41	24.40	27.13	28.50
217	20.00	1.31	17.31	24.53	29.41	32.77	34.45
222	20.00	1.31	17.86	25.31	30.35	33.81	35.54
227	20.00	1.31	17.86	25.31	30.35	33.81	35.54
240	17.63	1.31	17.97	25.46	30.53	34.01	35.75
255	10.00	1.17	16.48	23.34	27.98	31.17	32.77
270	7.25	1.17	16.55	23.44	28.10	31.30	32.91
285	6.20	1.17	16.37	22.88	27.42	30.54	32.11
300	1.50	1.17	16.12	22.71	27.15	30.20	31.72
315	1.75	1.17	15.56	21.92	26.20	29.14	30.61
330	2.00	1.17	15.01	21.14	25.26	28.10	29.51
345	5.30	1.17	14.34	20.09	24.09	26.79	28.14

3 HYDRODYNAMIC MODELLING

3.1 General

Computational modelling techniques were used to examine the tidal regime and storm wave climate at the Corran Narrows. The modelling was undertaken using RPS' in-house suite of MIKE coastal process modelling software. This software was developed at the DHI and has been approved by SEPA for the assessment of processes within the coastal physical environment.

3.2 Model Software

3.2.1 Hydrodynamic Model

The Hydrodynamic Module simulates water level variations and flows in response to a variety of forcing functions in lakes, estuaries and coastal regions. The effects and facilities include:

- Flooding and drying;
- Momentum dispersion;
- Bottom shear stress;
- Coriolis force;
- Wind shear stress;
- Barometric pressure gradients;
- Ice coverage;
- Tidal potential;
- Precipitation/evaporation;
- Wave radiation stresses; and
- Sources and sinks.

The Hydrodynamic Module can be used to solve both three-dimensional (3D) and two-dimensional (2D) scenarios. In 2D the model is based on the shallow water equations - the depth-integrated incompressible Reynolds averaged Navier-Stokes equations.

3.2.2 Wave Model

The modelling of the waves in the study area was undertaken using the MIKE 21 Spectral Wave (SW) model. This is a new generation spectral wind-wave model based on unstructured meshes. The model simulates the growth, decay and transformation of wind-generated waves and swells in offshore and coastal areas. MIKE 21 SW accounts for the following physical phenomena:

- Wave growth by wind action;
- Non-linear wave-wave interaction;
- Dissipation due to white-capping;
- Dissipation due to bottom friction;
- Dissipation due to depth-induced wave breaking;
- Refraction and shoaling due to depth variations;

- Diffraction; and
- Wave-current interaction.

The discretisation of the governing equations in geographical and spectral domains is performed using a cell-centred finite volume method. In the geographical domain, an unstructured mesh technique is used. The time integration is performed using a fractional step approach where a multi-sequence explicit method is applied for the propagation of wave action.

The fully spectral formulation was used in the models and is based on the wave action conservation equation as described in e.g. Komen et al. (1994) and Young (1999), where the directional-frequency wave action spectrum is the dependent variable.

3.2.3 Sediment Transport

The Sediment Transport Module simulates the erosion, transport, settling and deposition of non-cohesive sediment in marine and estuarine environments and includes key physical processes such as forcing by waves, traction and saltation. The module can be used to assess the impact of marine developments on erosion and sedimentation patterns by including common structures such as jetties, piles or dikes. Point sources can also be introduced to represent localised increases in current flows as a result of various coastal structures such as revetments, groynes or outfalls.

3.3 Model Bathymetry

The simulation of the storm conditions at Corran Narrows was undertaken using a model of Loch Linnhe. The model was developed using flexible mesh technology to allow for a very fine resolution to be used around the site area while a coarser spacing could be employed in areas of the model further away from the study area.

The extent of the hydrodynamic model bathymetry is shown in Figure 3.1. Figure 3.2 and Figure 3.3 which display the extent of the wave model mesh for the southern and northern storm events respectively. The fine mesh structure and bathymetry around the study site at Corran Narrows in the hydrodynamic model are illustrated in Figure 3.4 and Figure 3.5 respectively. The grid spacing in the model varied from a fine 10m spacing or less around the narrow channel to 150m in the outer part of the model.

The bathymetry for this model was derived from several sources including Admiralty survey data released under the MEDIN project digital chart data from C-MAP and site-specific surveys undertaken by Aspect Surveys for this project.

The proposed mesh structures for design options and the final preferred design are presented in Section 4 and Section 5.

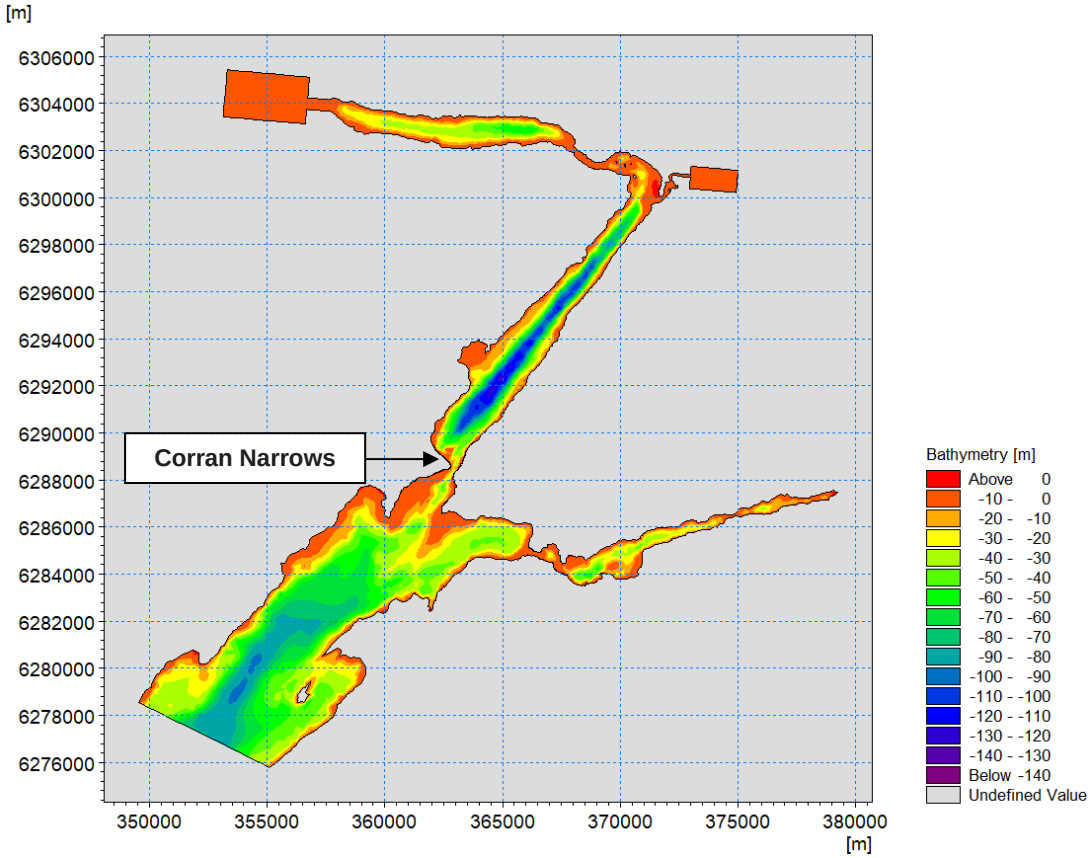

Figure 3.1: Hydrodynamic Flow Model bathymetry and mesh structure within the study area. Note that tanks were used to simulate water fluxes such as stream discharge in the upper loch.

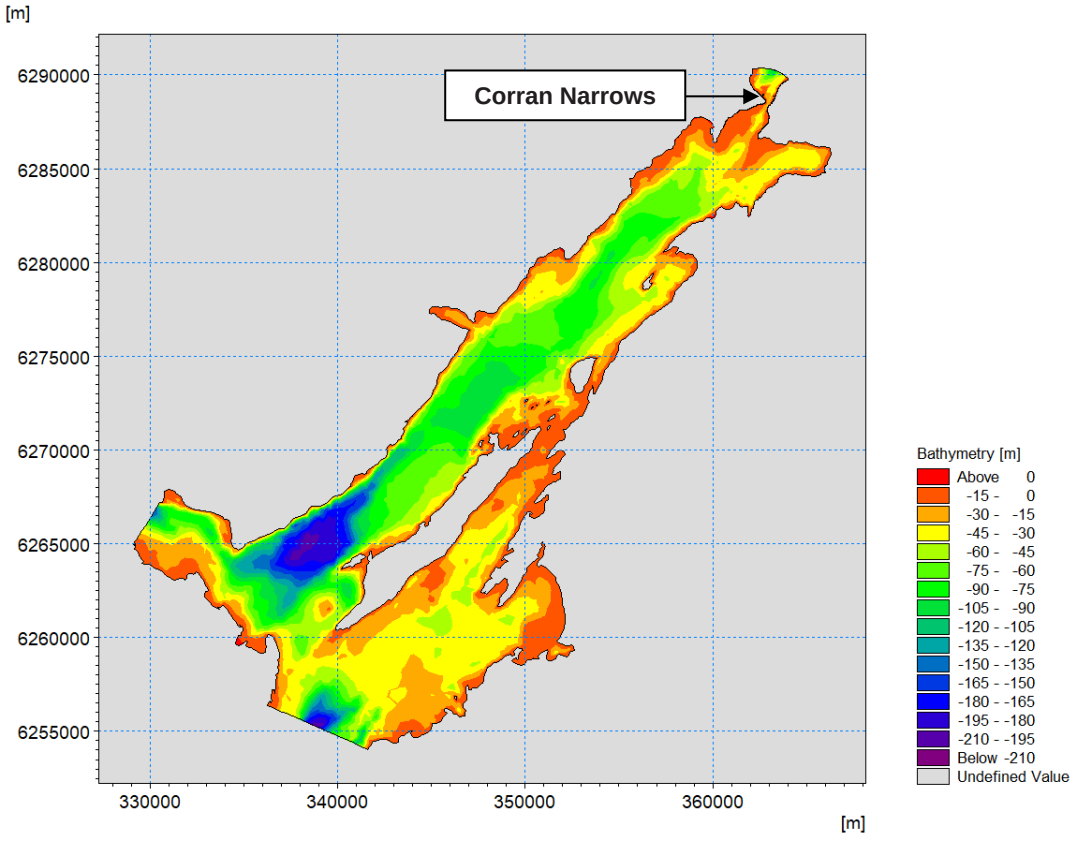

Figure 3.2: Wave Model bathymetry and mesh structure within the study area for the Southern Storm Events.

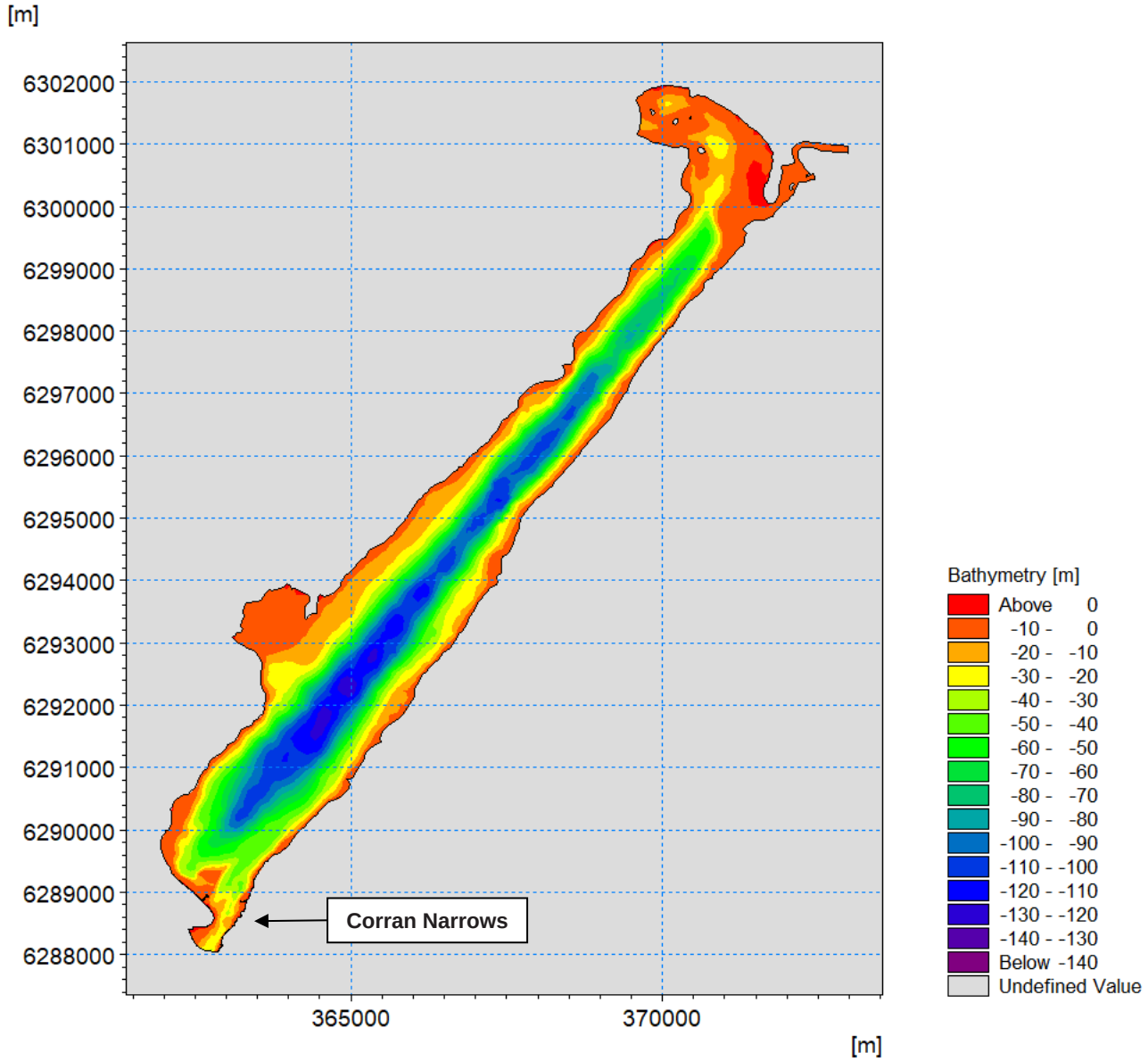

Figure 3.3: Wave Model bathymetry and mesh structure within the study area for the Northern Storm Events.

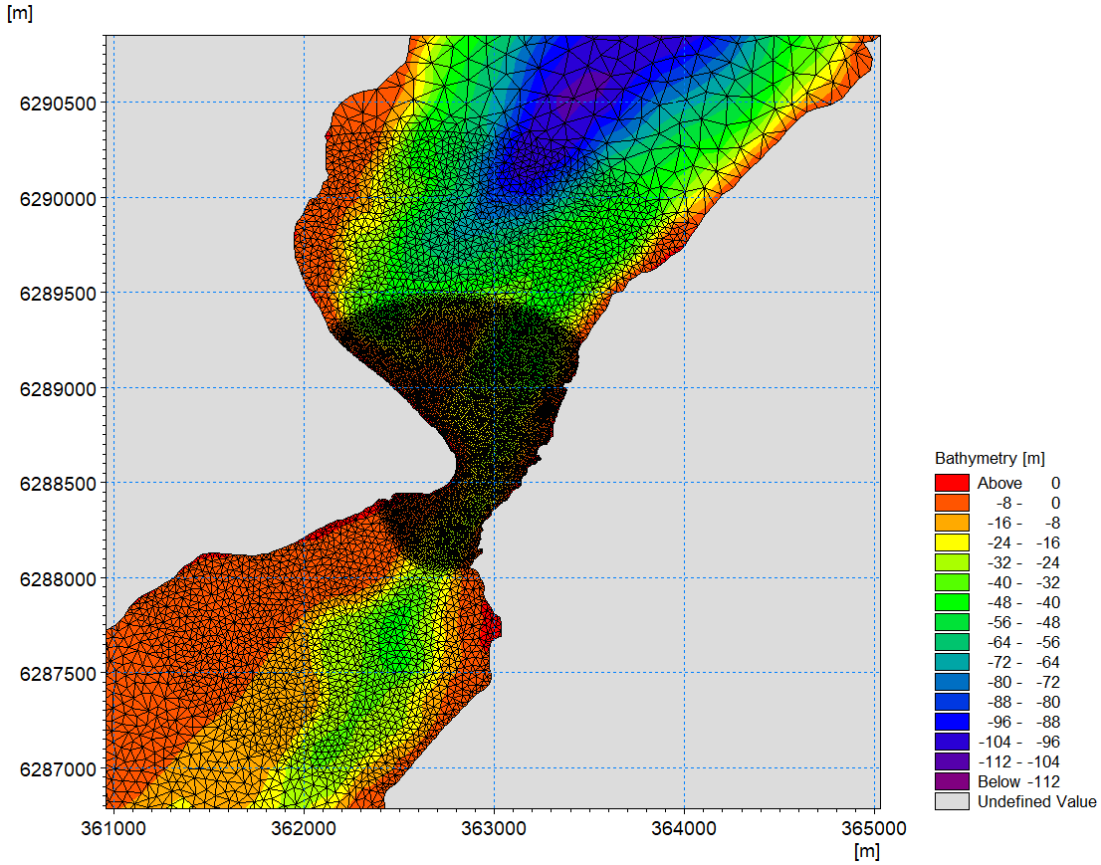

Figure 3.4: Zoomed model bathymetry and mesh structure within the study area

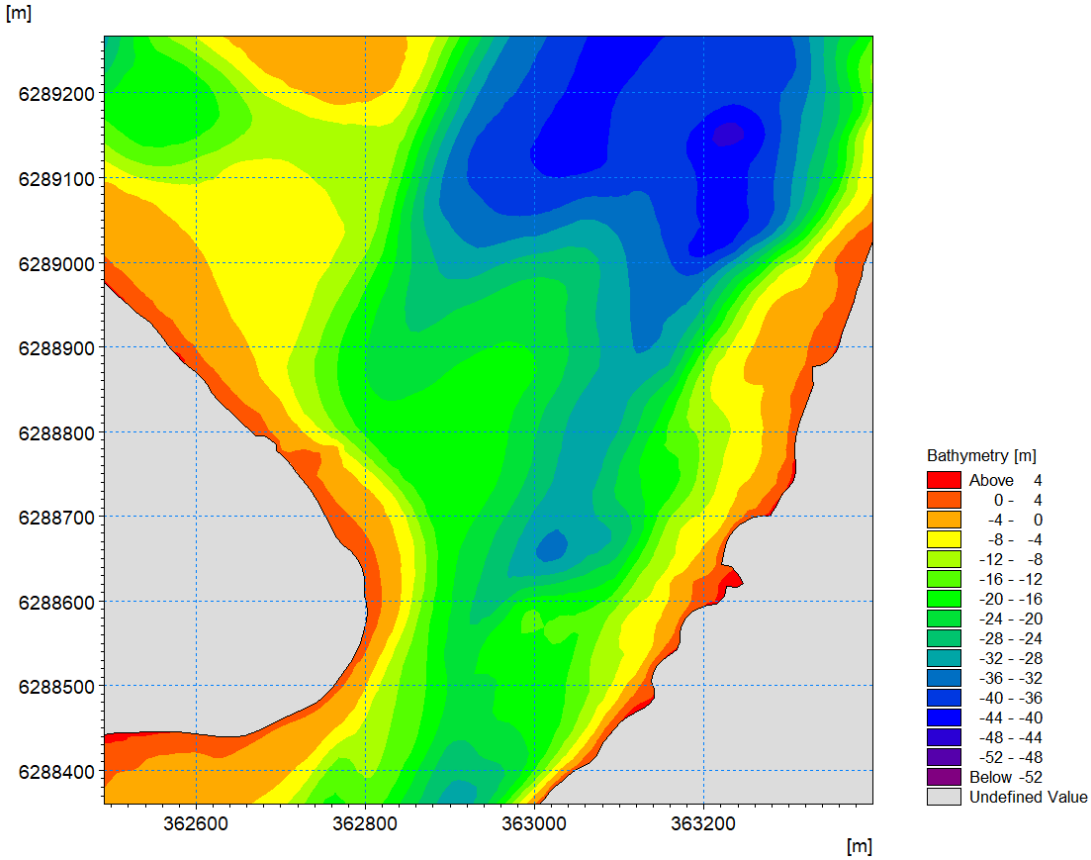

Figure 3.5: Existing Bathymetry in the Corran Narrows Hydrodynamic Model Domain

4 DESIGN OPTIONS

Extensive modelling of design options was undertaken prior to the selection of the preferred option (Section 5). Hydrodynamic data from the modelling was provided to assist with the design development. The earlier designs considered wave screens on the eastern berth at Nether Lochaber. Examples of these designs can be seen in Figure 4.1 and Figure 4.2. This wave screen was later replaced with a solid breakwater structure after the effectiveness of a wave screen was assessed and was deemed unsuitable (further information below). Examples of these designs are presented, with varying locations of the wave screen and proposed slipway.

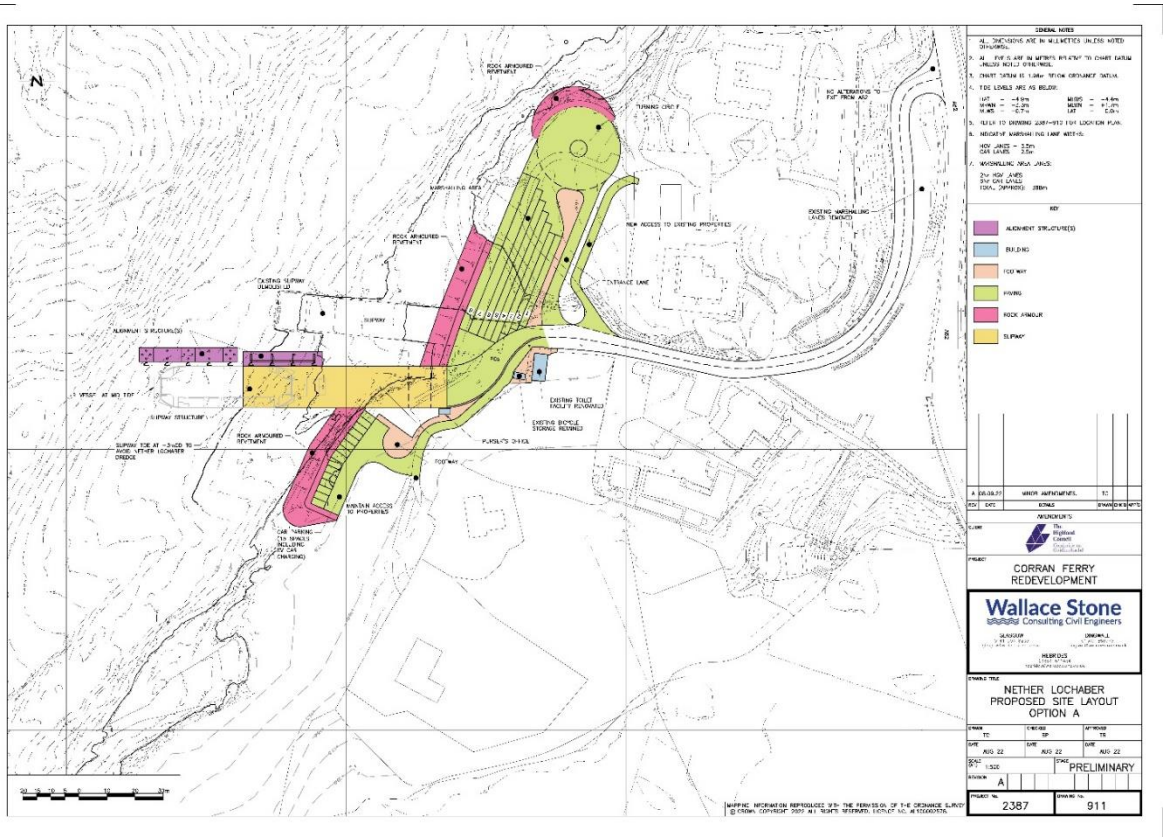

Figure 4.1 Nether Lochaber - Proposed Site Layout – Option A. A wave screen was placed on the north side of the slipway which exposed the southern side of the slipway to waves approaching from the south.

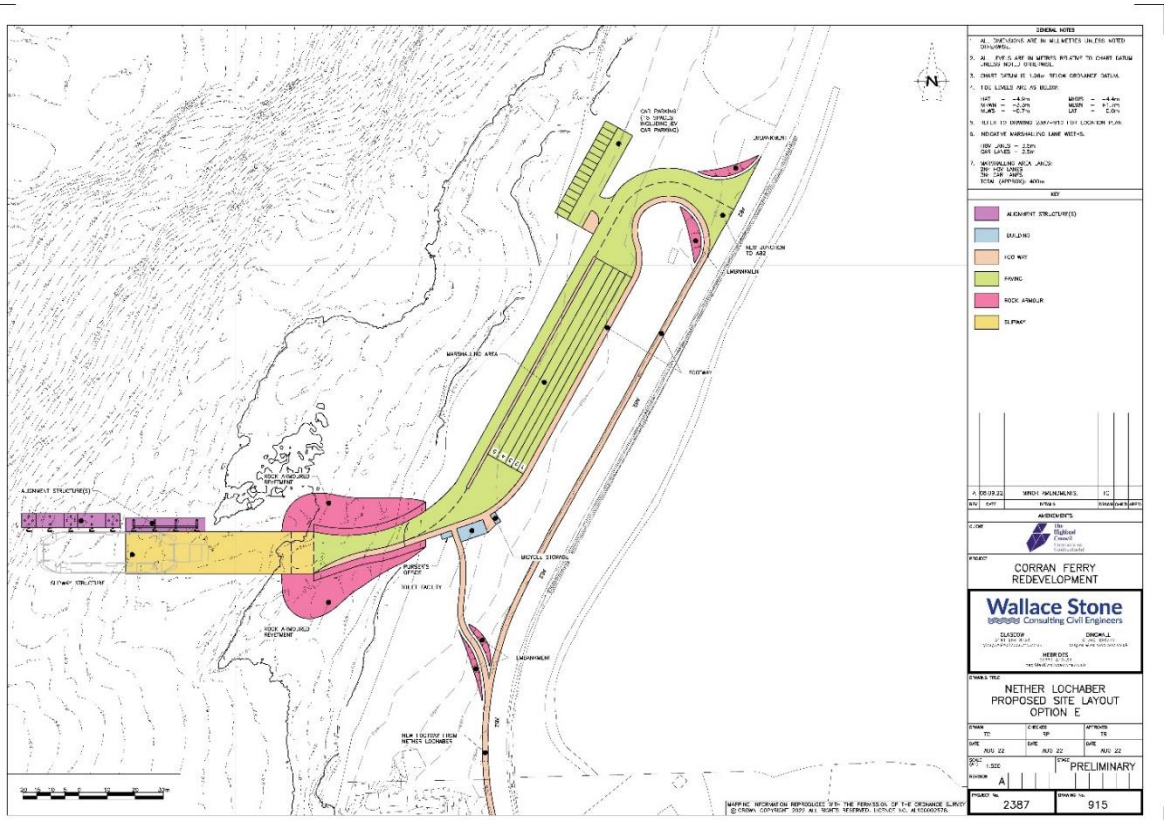

Figure 4.2 Nether Lochaber - Proposed Site Layout – Option E. As above, a wave screen was placed on the north side of the slipway which exposed the southern side of the slipway to waves approaching from the south.

Simulations were undertaken using Computational Fluid Dynamics (CFD) modelling assuming a significant wave height of 1.3m and a peak wave period of 4.5s at Mean High Water Spring (MHWS) to understand the ability of the wave screen to attenuate waves. The following wave screen designs were analysed:

- Simple Single Layer Screen 60% blockage;
- Double Layer Offset Screen with 50% blockage each layer;
- Double Layer Offset Screen with 50% front and 70% rear blockage; and
- Double Layer Offset Screen with 70% front and 70% rear blockage.

Figure 4.3 and Figure 4.4 show the results of the Computational Fluid Dynamics (CFD) modelling. After modelling various wave screen designs at the locations above, it was determined that this method would not be suitable for attenuating waves approaching from the south (despite placing the screen on the south side of the slipway). Instead, a solid breakwater structure was included on the south side of the slipway in the design for the Nether Lochaber berth.

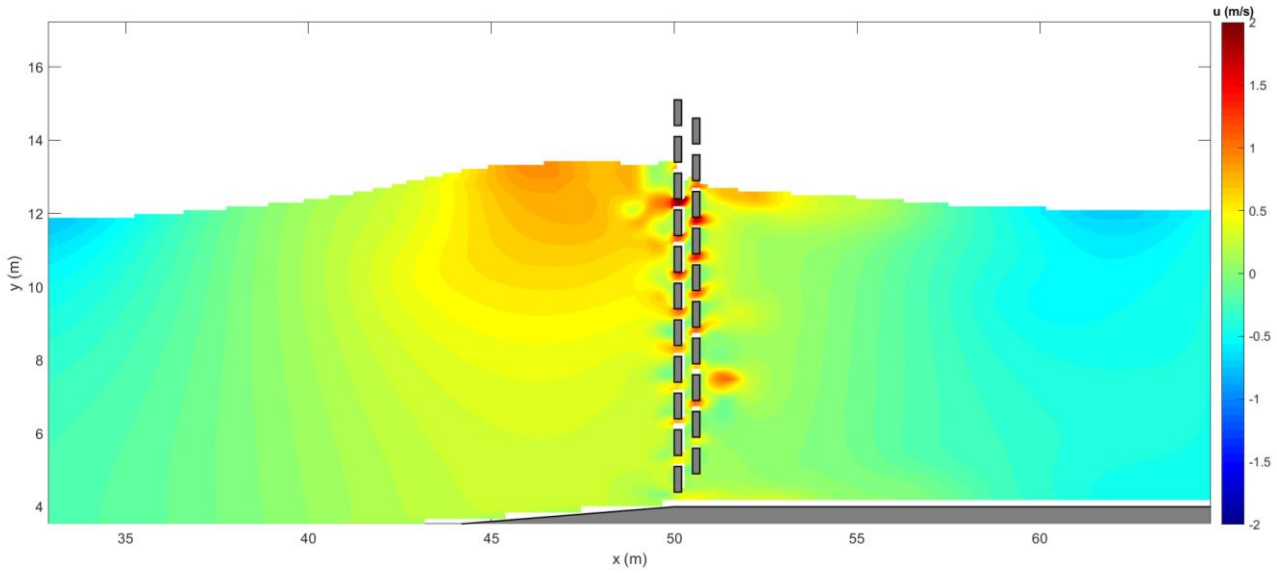

Figure 4.3 Wave flowing through screen – picture shows horizontal velocity of water particles (Design: Double Layer Offset Screen with 70% front and 70% rear blockage)

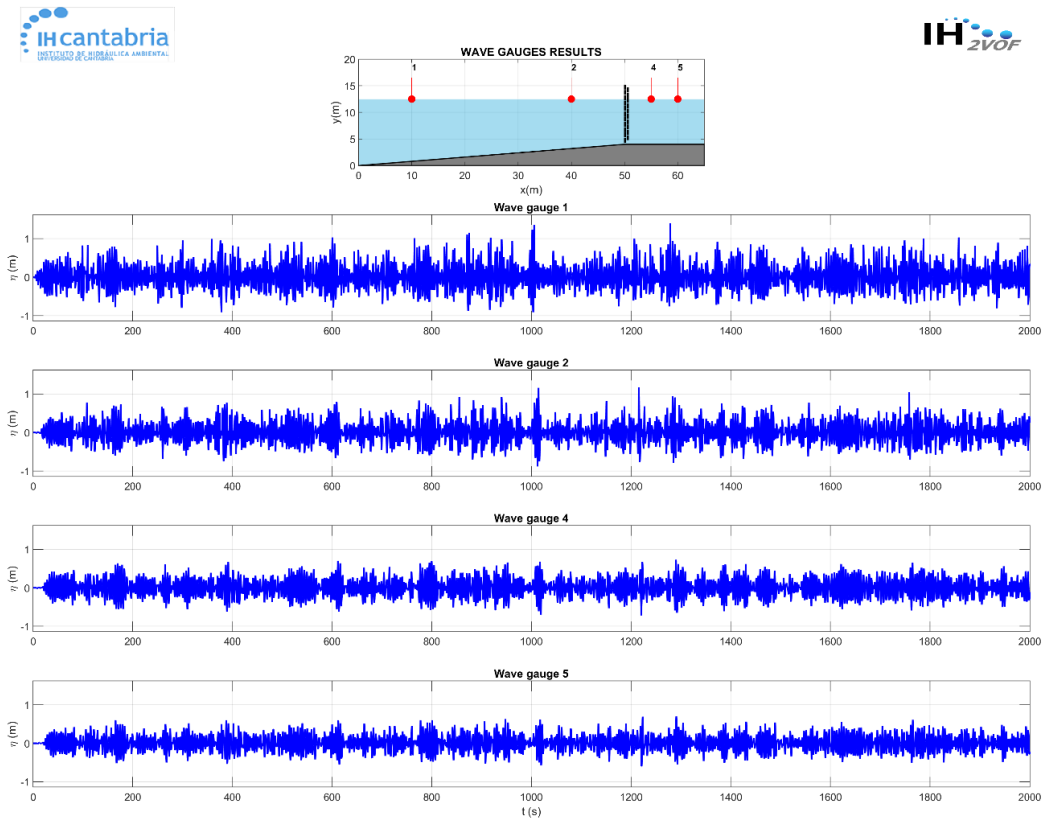

Figure 4.4: Wave traces showed a slight reduction in wave height (Design: Double Layer Offset Screen with 70% front and 70% rear blockage)

For the terminal at Ardgour, early design options were proposed which included alignment structures for the proposed slipway (Figure 4.5). Similarly, it was proposed to demolish the existing slipway, however, as the existing ferry is to be retained for a period, the existing slipway is now to be retained. There are no alignment structures on the new slipway in the final design.

In terms of the overnight berthing structure, to accommodate the ferry when not in use, four early options were explored, two of which are shown in Figure 4.6. All options were modelled but were further refined as shown in Figure 4.7 to Figure 4.10. As can be seen in these figures, combinations of open piled and solid sheet piled walls were considered for the overnight berthing structure.

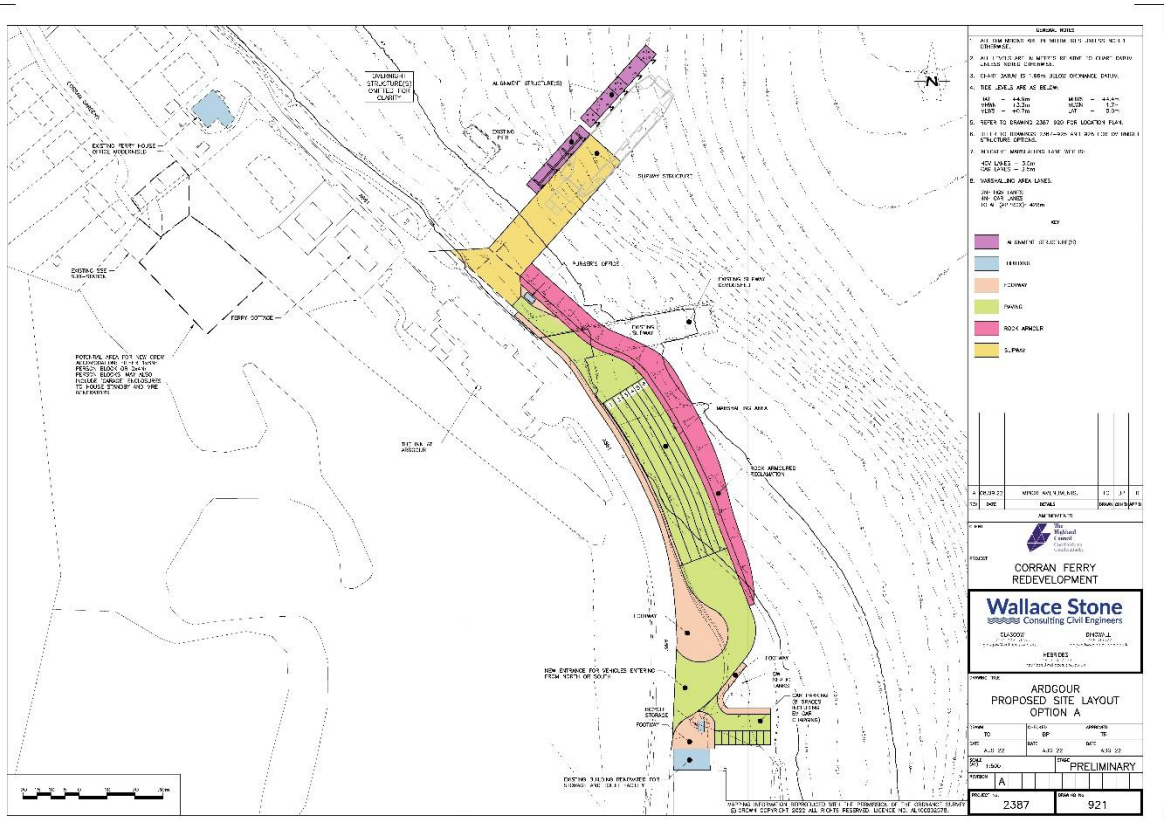

Figure 4.5: Ardgour - Proposed Site Layout – Option A

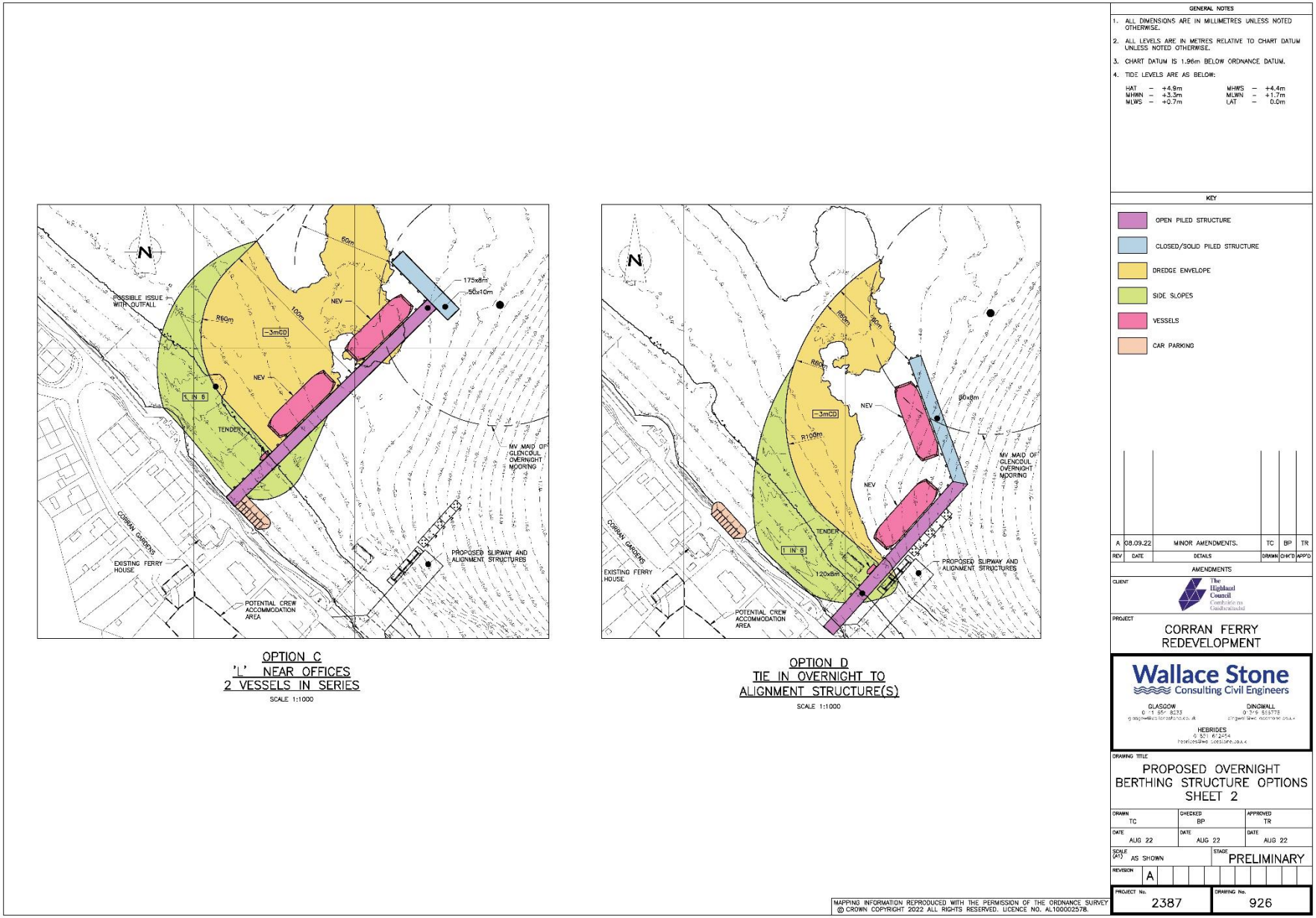

Figure 4.6: Proposed Overnight Berthing Structure Options – Option C (left) and Option D (right)

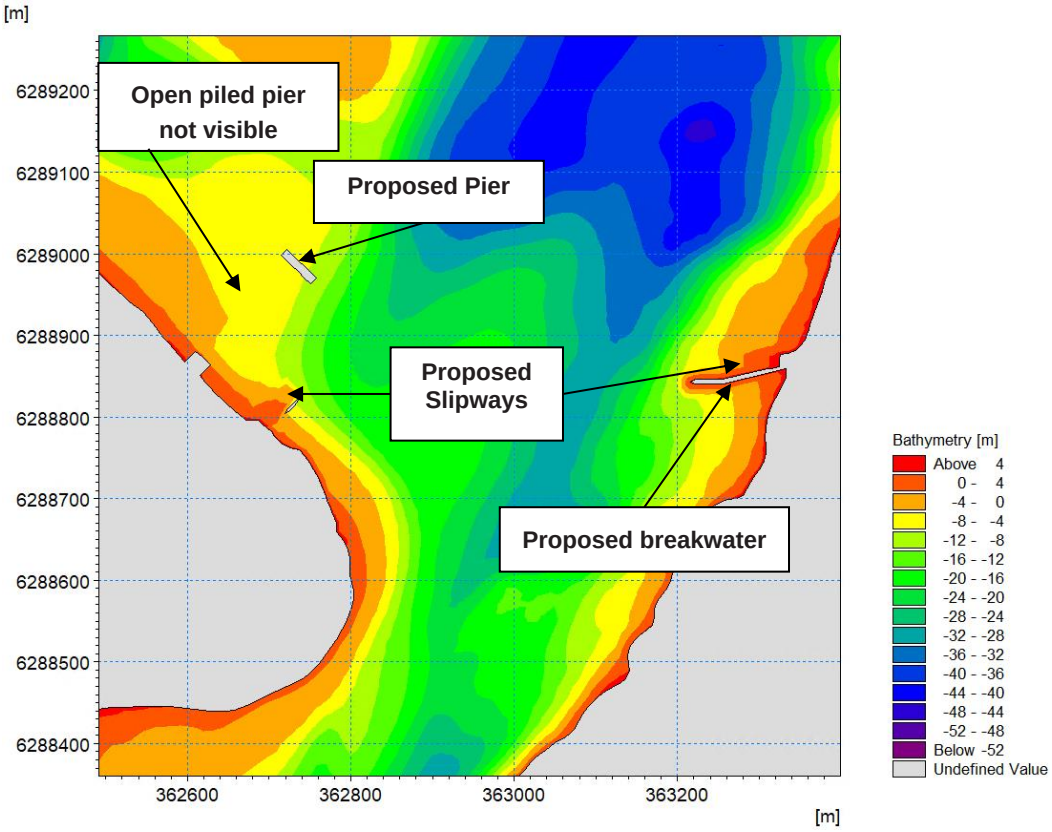

Figure 4.7: Model mesh of the open piled pier. Note the existing slipway has been removed as it was to be demolished.

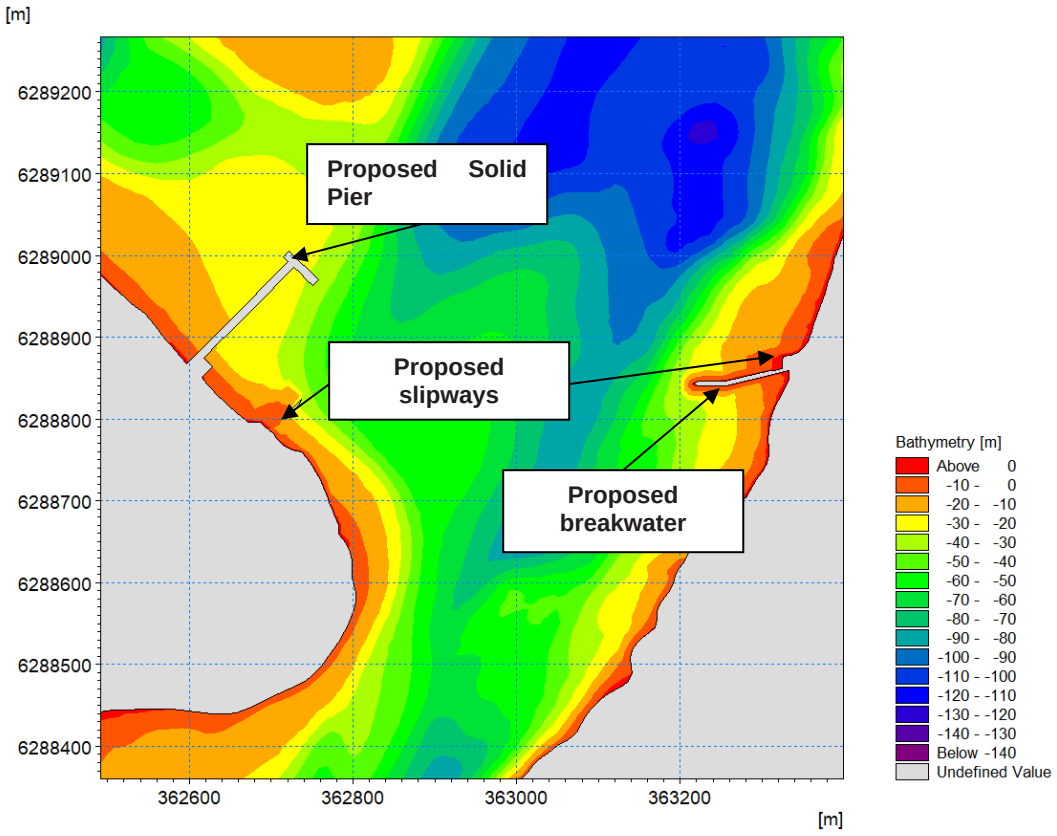

Figure 4.8: Model mesh with solid pier structure

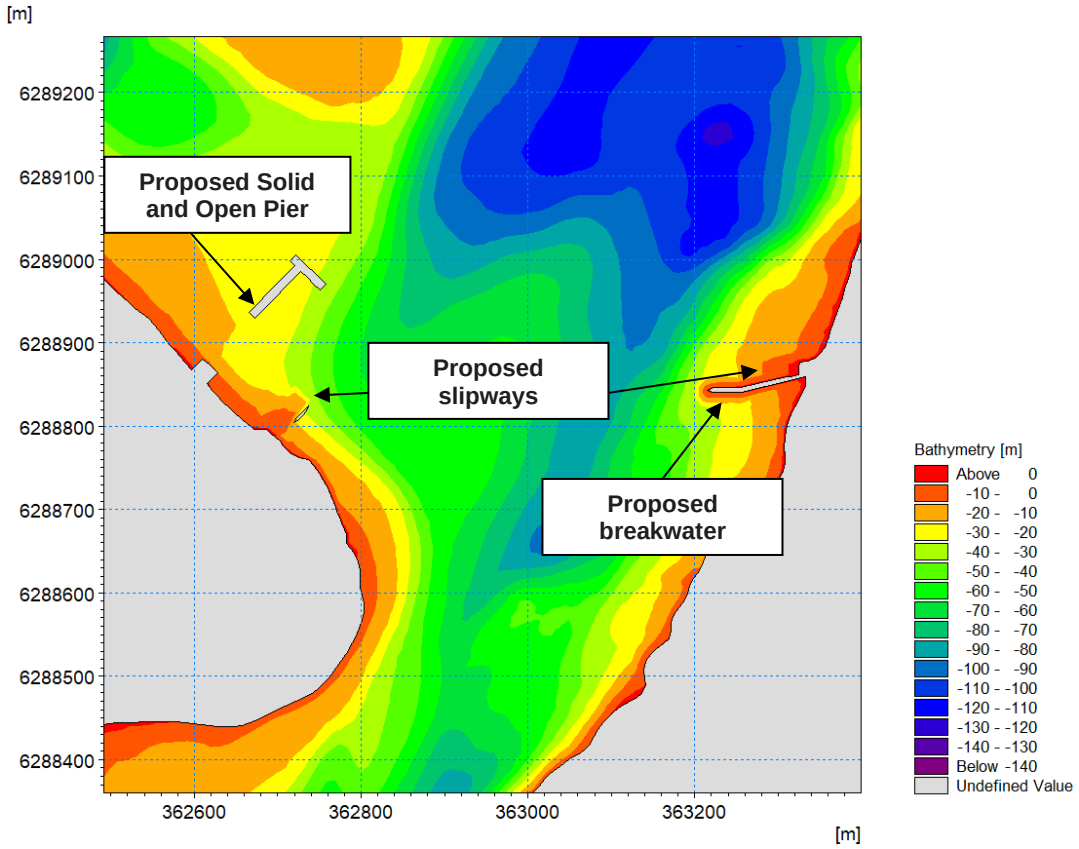

Figure 4.9: Mesh with combined open structure and solid pier

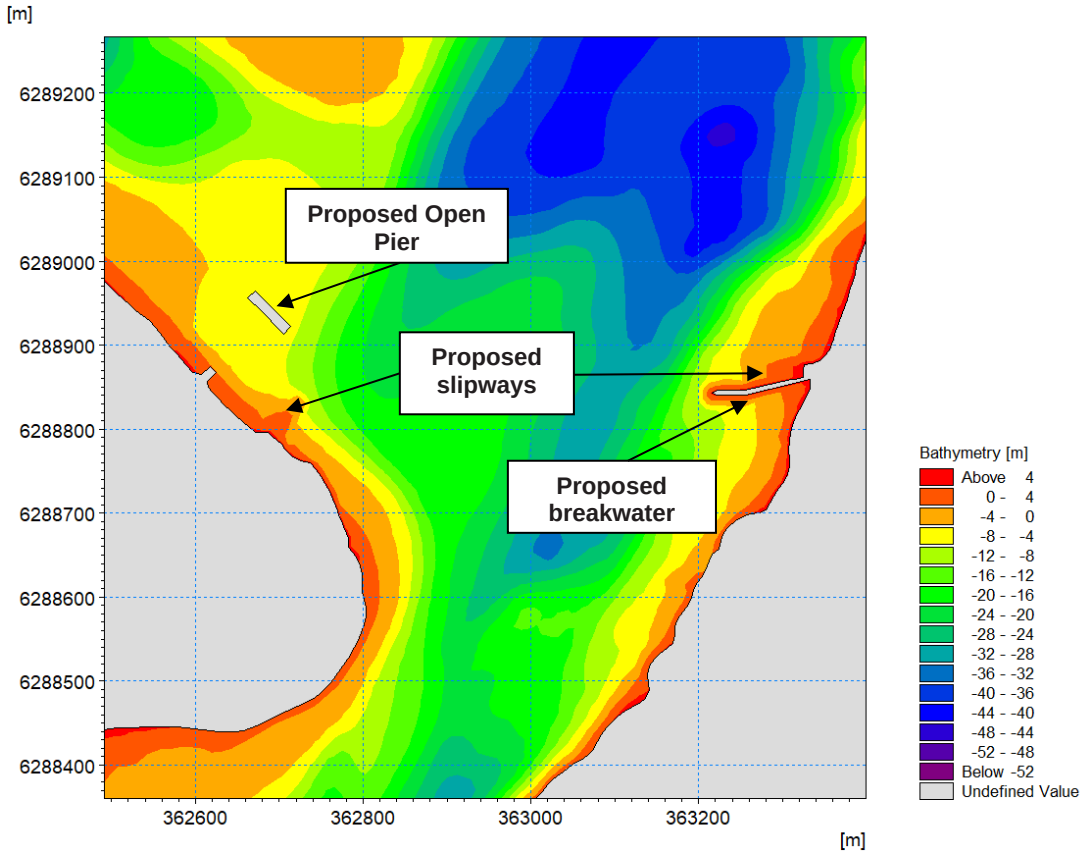

Figure 4.10: Model mesh with shorter open piled berth structure

5 PREFERRED DESIGN MODELLING

Figure 5.1 presents the preferred design for the new ferry infrastructure at Corran Narrows. The proposed pier and berth are shorter than most of the earlier designs in Section 4 and are a solid structure rather than open-piled. The location of the proposed slipways on both sides of the Narrows remained consistent during the design process, however, no alignment structures or marshalling areas at Ardgour are proposed in the preferred design scheme. The solid breakwater proposed on the eastern side is retained to reduce wave heights approaching from the south and the existing slipway at Ardgour is also to be retained.

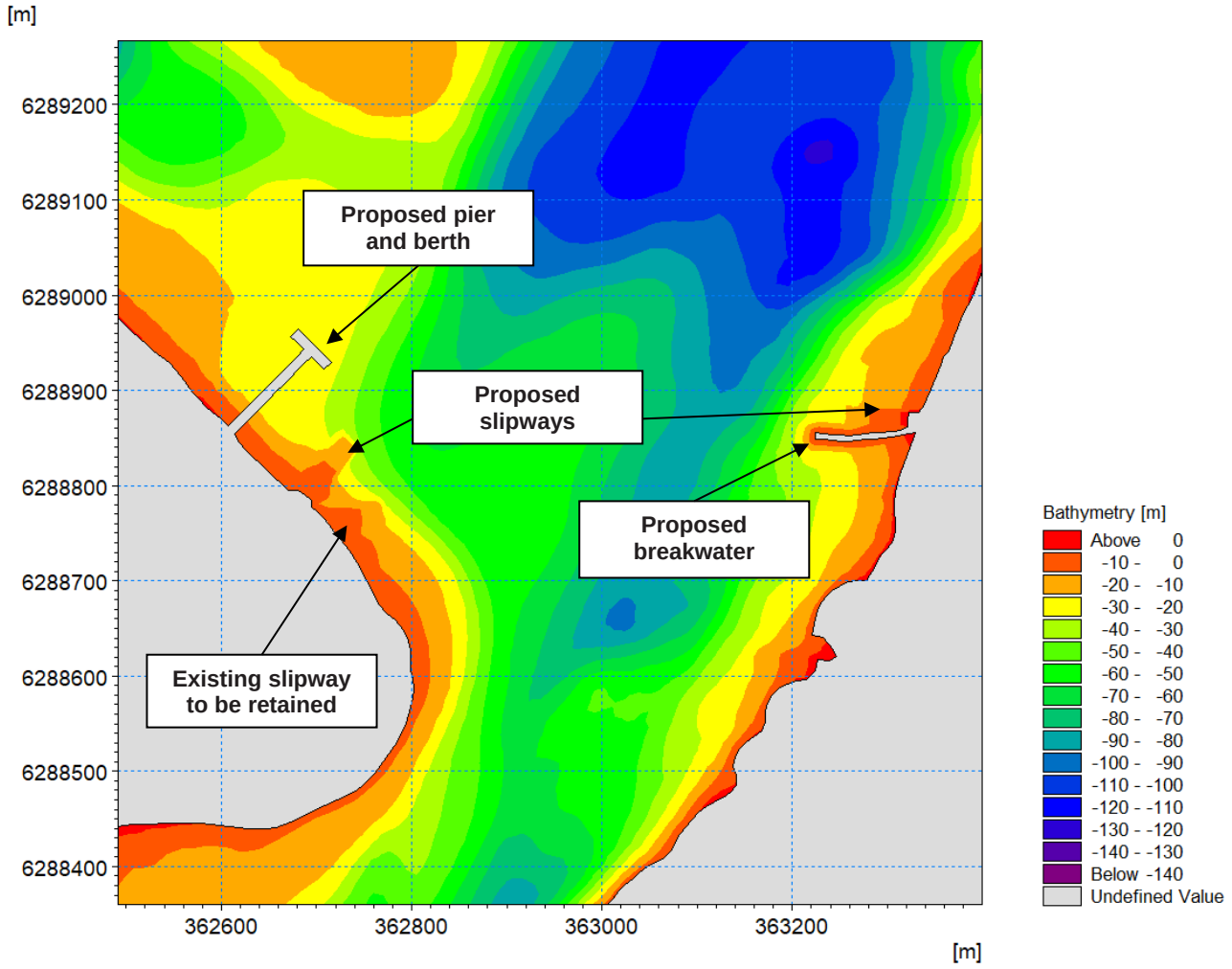

Figure 5.1: The Preferred Model Design for the Project

5.1 Tides

Figure 5.2 and Figure 5.3 show a comparison of the pre-project and post-project tidal velocities in the Corran Narrows. Most of the flow during the ebb and flood tide is localised to the constrained channel as expected. It is also demonstrated by the figures that there is little change to the overall tidal regime as a result of the Proposed Development. Figure 5.4 to Figure 5.7 compare tidal velocity and direction through a full tidal cycle for the existing and post-project scenarios at a closer scale which illustrates the localised changes in the tidal regime around the proposed structures. These figures also contain labelled velocity contours to aid comparison.

Figure 5.4 shows the velocities during a mid-flood spring tide. The current velocity in the main channel remains similar, however there is a small increase of 0.2m/s in current velocity to the west of the breakwater. There is also a marginal increase in the eddy velocity in the western side of the study area from below 0.2m/s to 0.8m/s. During the flood tide, there is a sharp change in the current velocity behind the breakwater (as labelled in Figure 5.4). The ferry operator should be aware of a stronger tide impacting the ferry stern, with a weaker tide impacting the bow as it approaches the eastern slipway (Table 5.1). A similar sharp change in current velocity does not appear during the ebb tide (Figure 5.6).

Figure 5.5 and Figure 5.7 show the current velocities at high water and low water respectively and show little difference. The current velocities in a mid-ebb tide are very similar and show the reduction of current velocity behind the proposed structures (Figure 5.6).

Table 5.1 Change in current velocity on approach to Proposed Lochaber Terminal

Tidal Phase	Main Channel (m/s)	Breakwater End (m/s)	Behind Breakwater (m/s)
Mid – Flood	1.94	0.12	0.09
High Water	0.42	0.03	0.03
Mid – Ebb	1.22	0.75	0.17
Low Water	0.56	0.25	0.01

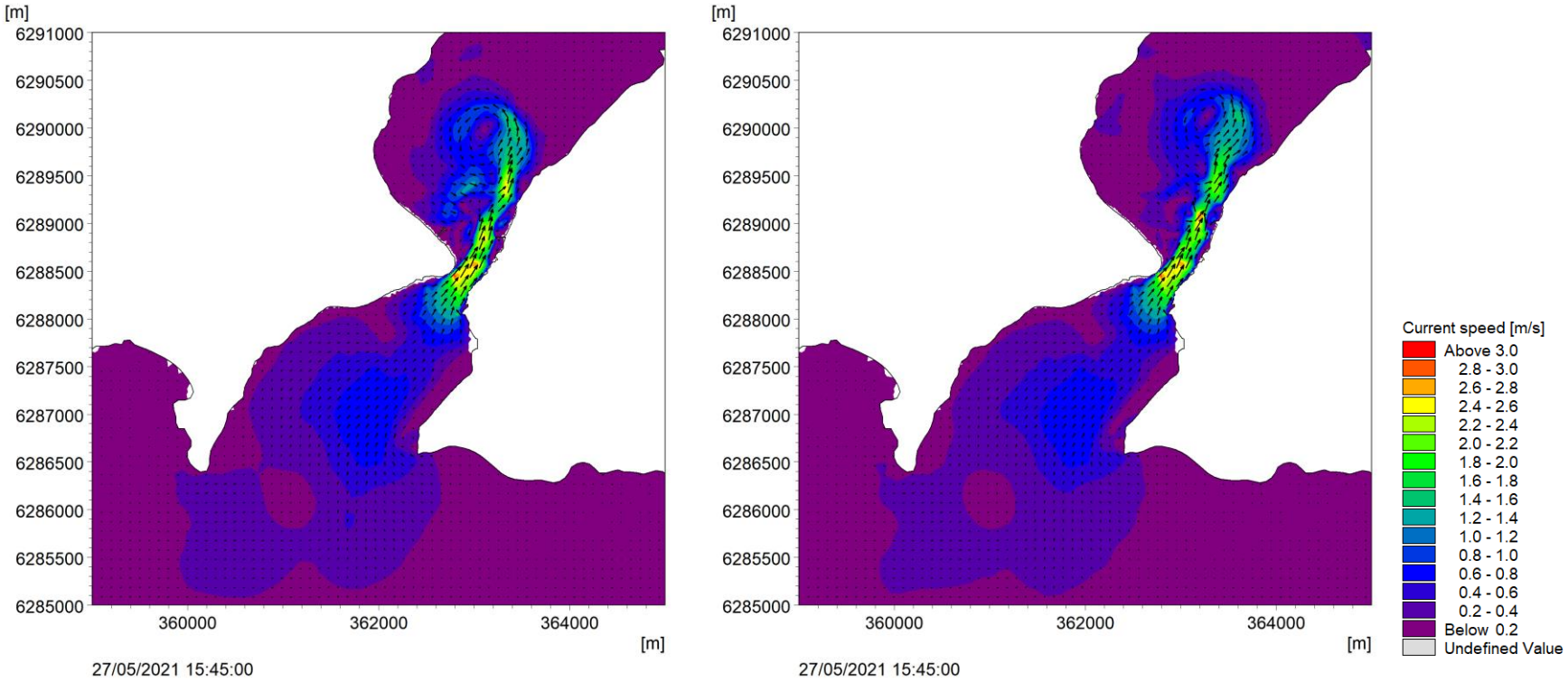

Figure 5.2: Wide extent of current speed during a Mid-Flood Spring Tide – Post-Project (Left) and Pre-Project (Right)

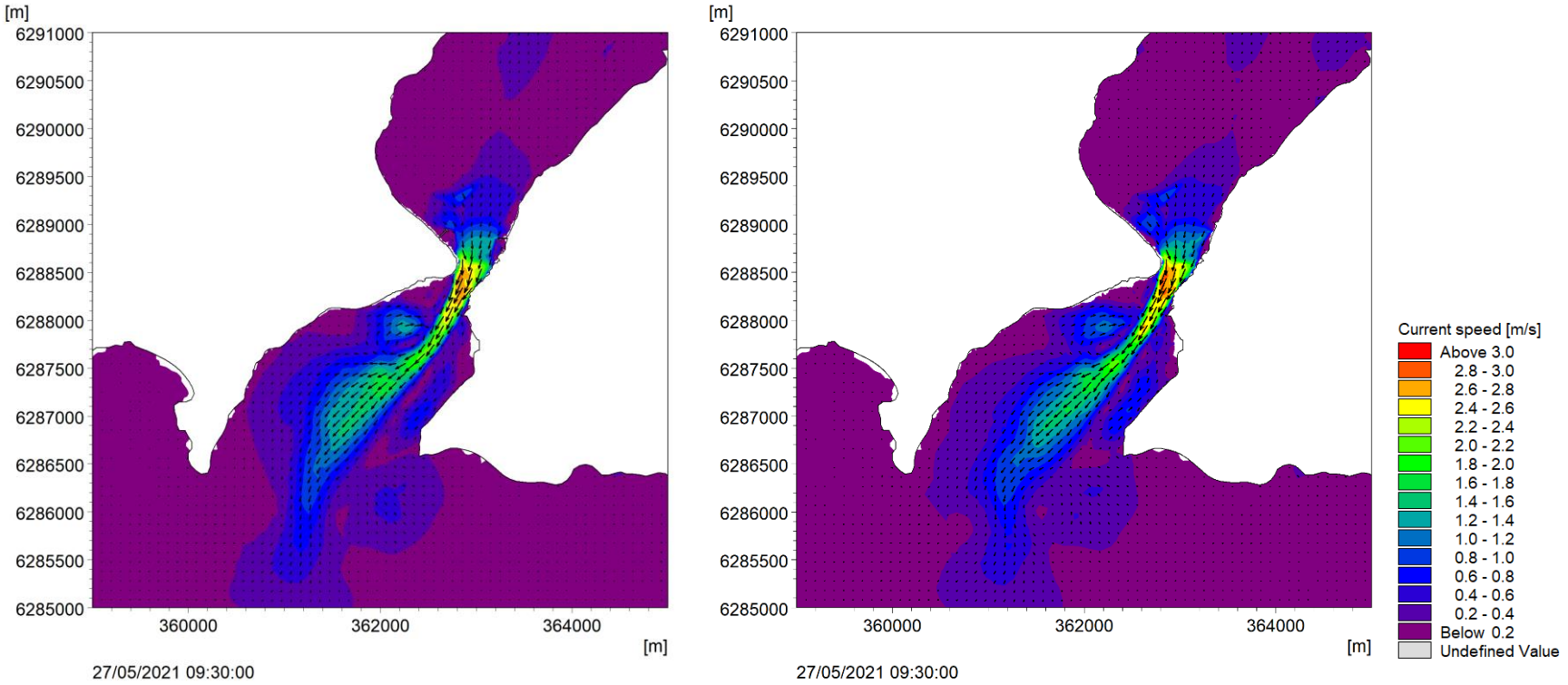

Figure 5.3: Wide extent of current speed during a Mid-Ebb Spring Tide – Post-Project (Left) and Pre-Project (Right)

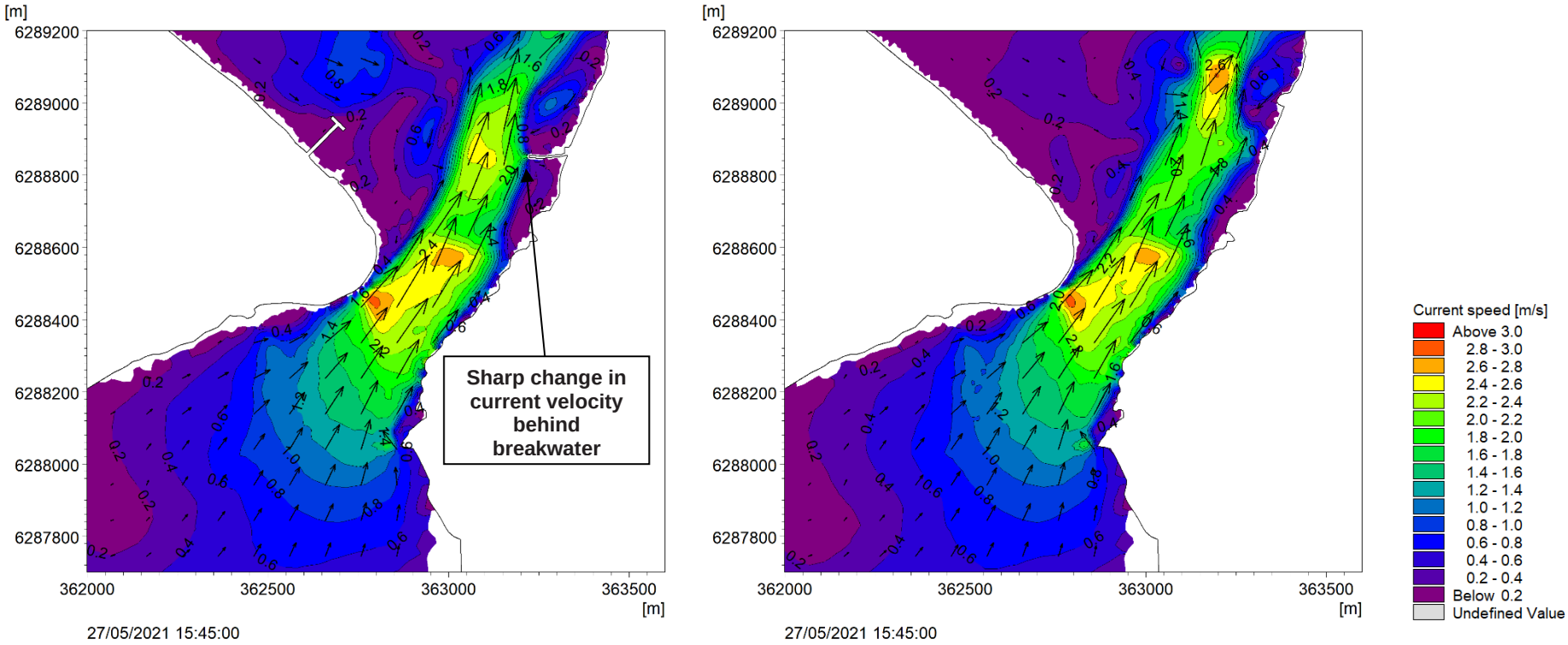

Figure 5.4: Current speed during a Mid-Flood Spring Tide – Post-Project (Left) and Pre-Project (Right)

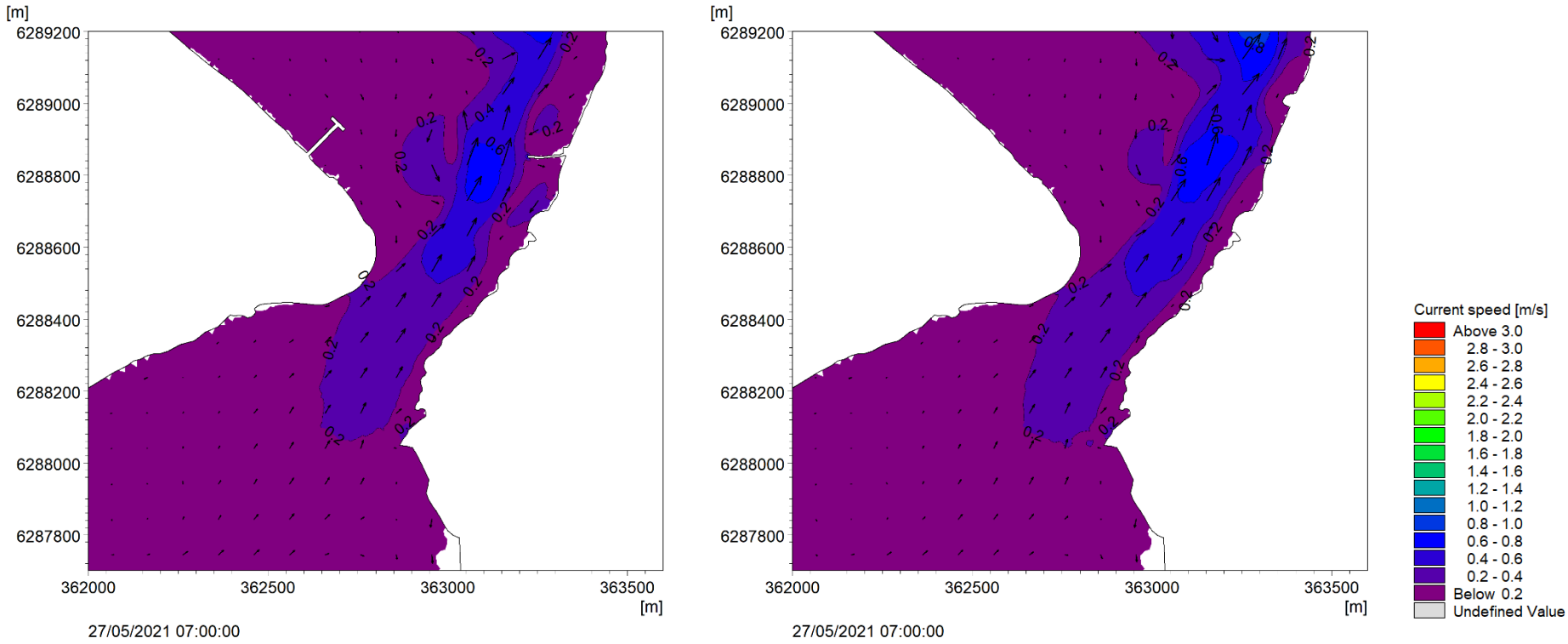

Figure 5.5: Current speed during High Water Springs – Post-Project (Left) and Pre-Project (Right)

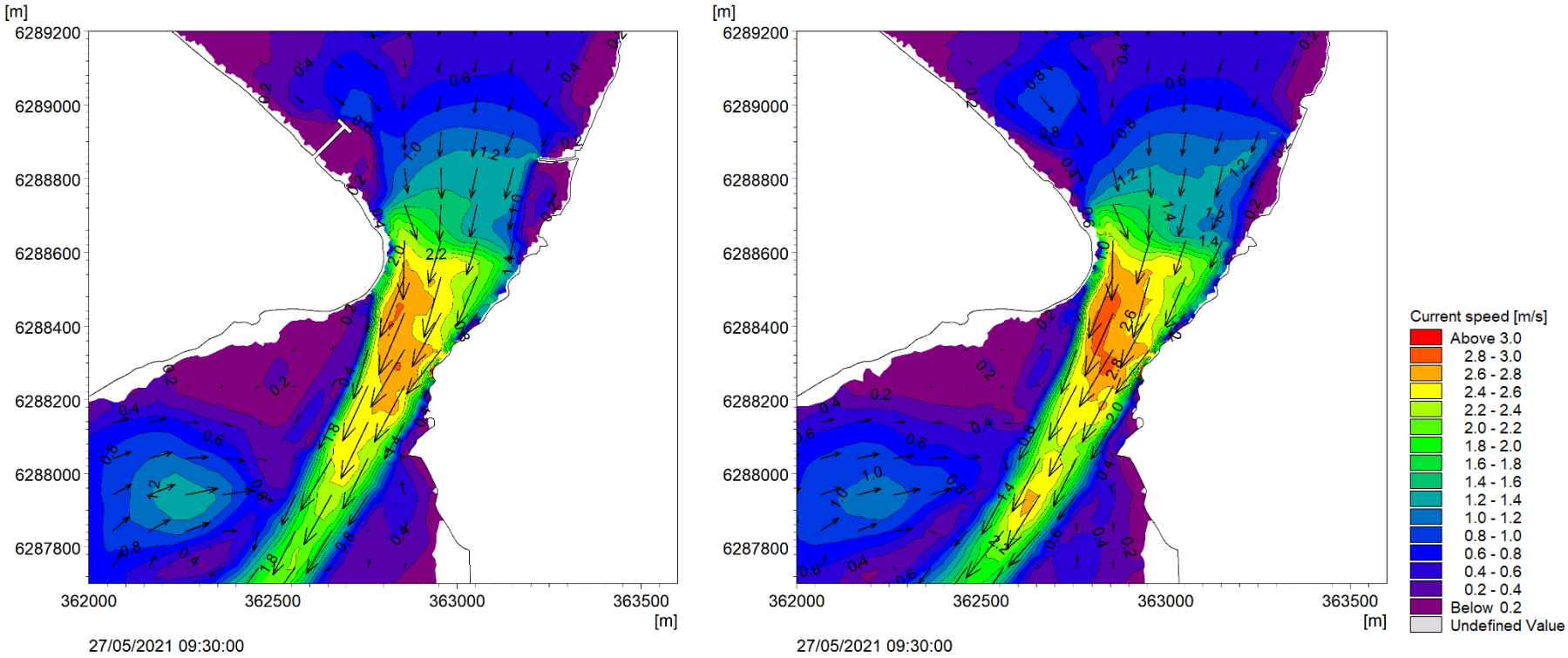

Figure 5.6: Current speed during a Mid-Ebb Spring Tide – Post-Project (Left) and Pre-Project (Right)

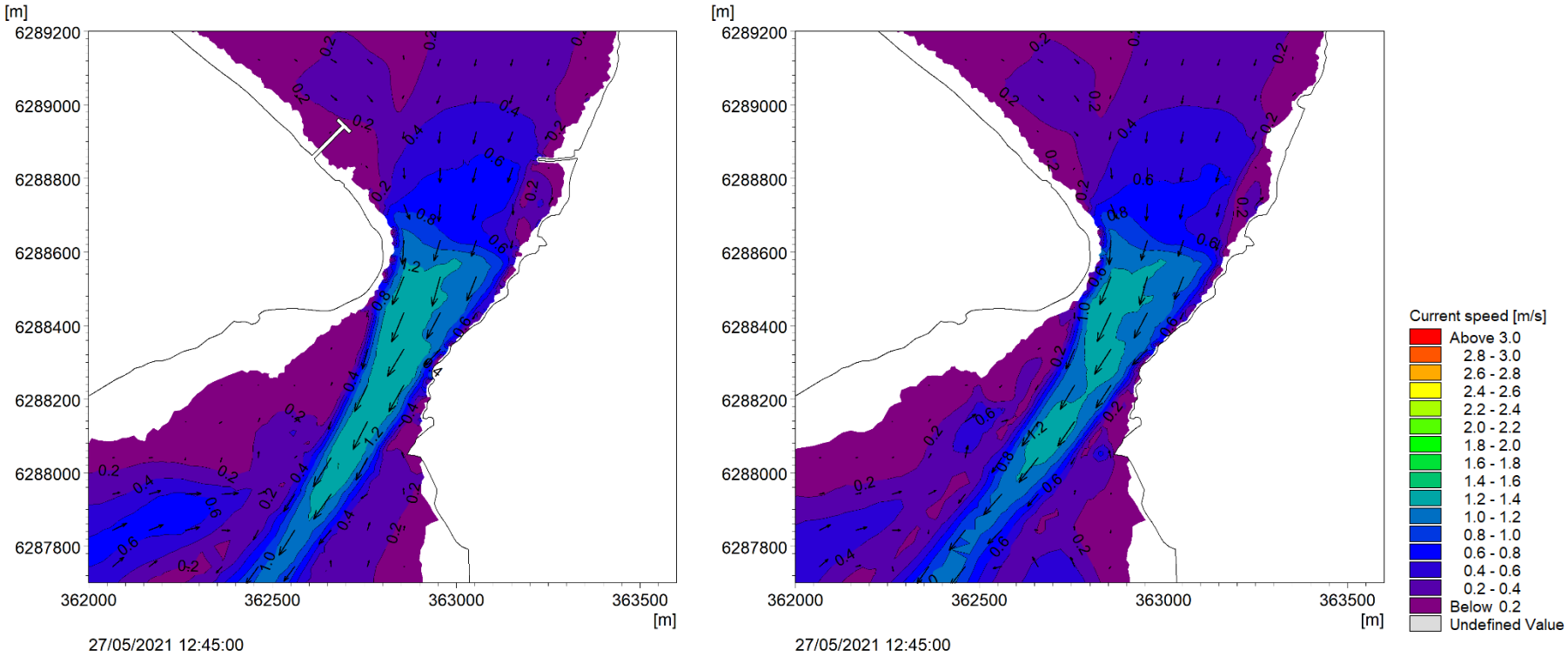

Figure 5.7: Current speed during Low Water Springs – Post-Project (Left) and Pre-Project (Right)

5.2 Waves

Figure 5.8 and Figure 5.9 shows the extraction points used to establish the wave climate (significant wave height, peak wave period and mean wave direction) around the existing and proposed structures in the Corran Narrows. Table 5.2 to Table 5.21 summarises these wave parameters for each location with various storm return periods and directions. For the proposed berth at Ardgour, the critical direction was 30° which resulted in a significant wave height of 2.30m during a 1 in 100 year storm (Table 5.6) (Note: this model simulation included reflection coefficients to understand wave height beside the vertical wall which is critical for vessel berths). This wave direction also resulted in the highest wave heights at the other extract points at Ardgour.

For the proposed infrastructure at Nether Lochaber, the south-westerly storms resulted in the largest significant wave heights (c.1.81m for a 1 in 100 year event) at the existing slipway and south side of the breakwater.

Figure 5.10 to Figure 5.17 display the results of 1 in 100 year storm events for various directions for the pre and post-project scenario. The significant wave height is slightly higher from the south, 1.95m to 2.10m, compared to 1.65m to 1.80m from the north in the ferry crossing path. The waves from the south are generated from the longer fetch spanning from the southern end of Loch Linnhe. This merits the requirement for an adequate breakwater on the south side of the eastern slipway.

It should be noted that the southerly significant wave height decreases slightly as the waves pass through the Narrows from the south side of the Loch to the north. For example, the wave height decreases from 2.25m in the channel to 1.80m opposite the breakwater in Figure 5.12. The western berth and slipway are naturally protected by the land during southern storms. Diffraction is observed around the western end of the breakwater as expected but as the slipway is located close to the north side of the breakwater, wave height is reduced to a safe level for ferry berthing.

For the northerly storms, as mentioned, the significant wave heights are not as large as the southerly events. The largest significant wave height appears during the north-easterly event with values between 1.65m and 1.80m present around the ferry path (Figure 5.16). During the northern storms, the vertical wall at the end of the pier protects the berth on the west side of the channel. This is important as it will protect the moored ferry vessel.

For the proposed scenarios, it is stated in the figure captions whether a reflection coefficient was added to the proposed structures. This was undertaken to understand the difference in wave height due to waves reflecting from the structures, such as the vertical pier wall of the Ardgour berth, which resulted in a higher wave height. For example, Figure 5.16 shows a higher wave height at the pier due to the wave reflection occurring.

Figure 5.8 Wave climate parameters extraction points for Ardgour

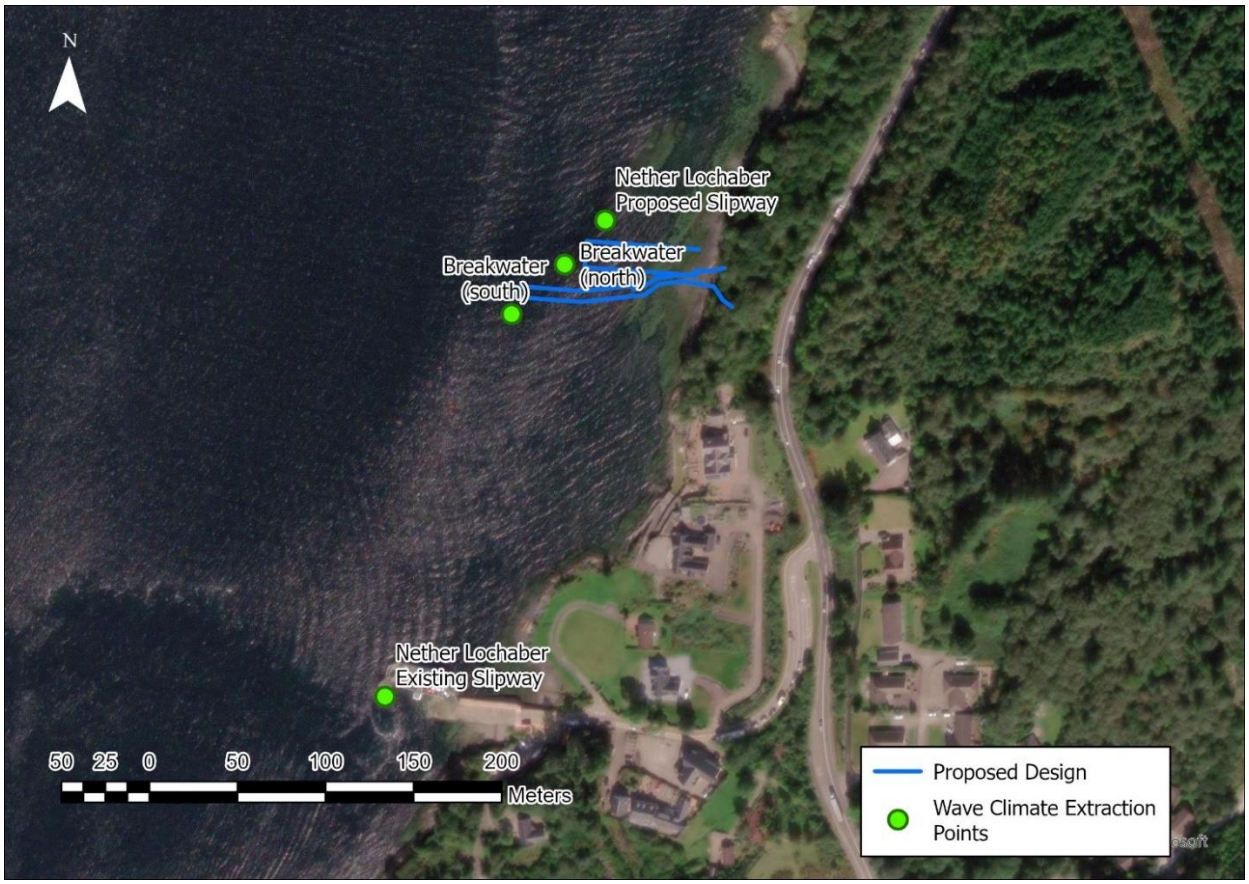

Figure 5.9 Wave climate parameters extraction points for Nether Lochaber

Table 5.2: Wave climate parameters for South-Westerly (217-227°) storms for various return periods at Ardgour with reflection coefficient

	Berth 1			Berth 2			Berth End			Proposed Slipway			Existing Slipway		
Return Period	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)
1 in 0.1	0.22	1.11	217	0.20	1.11	220	0.19	1.56	187	0.25	1.20	206	0.22	1.51	170
1 in 1	0.41	1.47	218	0.38	1.46	226	0.33	1.90	192	0.46	1.56	206	0.42	1.74	175
1 in 10	0.56	1.67	218	0.53	1.65	227	0.45	2.17	185	0.62	1.76	208	0.55	1.99	171
1 in 50	0.67	1.80	218	0.63	1.79	227	0.54	2.34	185	0.74	1.89	208	0.65	2.13	170
1 in 100	0.73	1.86	218	0.69	1.84	227	0.59	2.42	185	0.81	1.96	208	0.71	2.21	170

Table 5.3: Wave climate parameters for South-Westerly (217-227°) storms for various return periods at Ardgour without reflection coefficient

	Berth 1			Berth 2			Berth End			Proposed Slipway			Existing Slipway		
Return Period	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)
1 in 0.1	0.18	1.04	200	0.17	1.04	231	0.19	1.55	184	0.23	1.15	190	0.22	1.49	166
1 in 1	0.34	1.37	200	0.33	1.40	238	0.34	1.97	185	0.43	1.49	197	0.40	1.97	172
1 in 10	0.47	1.57	201	0.45	1.59	241	0.46	2.22	185	0.59	1.70	198	0.53	2.23	169
1 in 50	0.56	1.70	201	0.55	1.72	242	0.54	2.39	184	0.70	1.82	198	0.63	2.39	166
1 in 100	0.61	1.75	201	0.59	1.78	242	0.59	2.48	185	0.77	1.89	199	0.70	2.42	167

Table 5.4: Wave climate parameters for South-South Easterly (135-180°) storms for various return periods at Ardgour with reflection coefficient

	Berth 1			Berth 2			Berth End			Proposed Slipway			Existing Slipway		
Return Period	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)
1 in 0.1	0.24	1.45	83	0.11	0.88	194	0.23	1.49	133	0.23	1.45	126	0.22	1.40	167
1 in 1	0.37	1.66	179	0.19	1.11	194	0.32	1.80	144	0.39	1.76	167	0.37	1.73	165
1 in 10	0.53	1.95	108	0.25	1.25	194	0.48	2.03	138	0.52	1.97	166	0.49	1.93	164
1 in 50	0.64	2.12	106	0.30	1.34	194	0.58	2.18	137	0.63	2.15	140	0.59	2.08	162
1 in 100	0.70	2.18	104	0.33	1.38	194	0.63	2.16	132	0.69	2.21	139	0.64	2.15	162

Table 5.5: Wave climate parameters for South-South Easterly (135-180°) storms for various return periods at Ardgour without reflection coefficient

	Berth 1			Berth 2			Berth End			Proposed Slipway			Existing Slipway		
Return Period	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**
1 in 0.1	0.20	1.44	120	0.10	0.84	198	0.18	1.51	148	0.21	1.42	129	0.21	1.38	163
1 in 1	0.30	1.56	126	0.17	1.06	198	0.32	1.88	148	0.36	1.74	159	0.36	1.71	162
1 in 10	0.44	1.94	129	0.23	1.19	198	0.46	2.05	133	0.48	1.94	159	0.47	1.91	161
1 in 50	0.53	2.12	129	0.27	1.28	198	0.55	2.19	133	0.57	2.10	158	0.57	2.04	160
1 in 100	0.58	2.17	128	0.30	1.32	198	0.61	2.30	132	0.63	2.19	138	0.61	2.12	159

Table 5.6: Wave climate parameters for North-Easterly (30-40°) storms for various return periods at Ardgour with reflection coefficient

	Berth 1			Berth 2			Berth End			Proposed Slipway			Existing Slipway		
Return Period	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**
1 in 0.1	0.30	3.07	47	0.57	3.08	33	0.85	3.07	340	0.63	3.06	28	0.63	3.06	26
1 in 1	0.54	3.80	47	0.96	3.79	33	1.39	3.76	341	1.03	3.75	28	1.04	3.76	26
1 in 10	0.74	4.24	48	1.27	4.23	33	1.81	4.19	341	1.33	4.16	29	1.36	4.18	26
1 in 50	0.90	4.58	48	1.52	4.54	33	2.13	4.45	340	1.55	4.35	29	1.59	4.41	26
1 in 100	0.98	4.70	49	1.64	4.68	33	2.30	4.63	340	1.67	4.57	29	1.71	4.61	26

Table 5.7: Wave climate parameters for North-Easterly (30-40°) storms for various return periods at Ardgour without reflection coefficient

	Berth 1			Berth 2			Berth End			Proposed Slipway			Existing Slipway		
Return Period	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**
1 in 0.1	0.28	3.08	55	0.49	3.07	16	0.65	3.07	29	0.64	3.07	28	0.64	3.07	25
1 in 1	0.49	3.79	57	0.80	3.79	15	1.07	3.76	29	1.04	3.75	28	1.05	3.76	26
1 in 10	0.67	4.23	59	1.07	4.22	13	1.40	4.19	29	1.34	4.16	29	1.36	4.18	26
1 in 50	0.81	4.53	60	1.27	4.52	12	1.65	4.44	29	1.56	4.35	29	1.60	4.41	26
1 in 100	0.88	4.67	60	1.37	4.67	12	1.78	4.64	30	1.68	4.57	29	1.72	4.61	26

Table 5.8: Wave climate parameters for North-Westerly (315-330°) storms for various return periods at Ardgour with reflection coefficient

	Berth 1			Berth 2			Berth End			Proposed Slipway			Existing Slipway		
Return Period	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**
1 in 0.1	0.20	2.86	47	0.50	2.22	27	0.66	2.72	337	0.49	2.73	27	0.50	2.72	23
1 in 1	0.34	3.53	48	0.86	2.75	27	1.11	3.37	336	0.82	3.37	26	0.84	3.37	23
1 in 10	0.46	3.94	48	1.17	3.33	30	1.44	3.74	336	1.07	3.74	26	1.11	3.71	19
1 in 50	0.55	4.23	49	1.39	3.57	30	1.70	3.86	331	1.26	3.89	22	1.31	3.91	19
1 in 100	0.60	4.34	49	1.50	3.70	30	1.83	4.01	331	1.35	4.06	23	1.41	4.09	19

Table 5.9: Wave climate parameters for North-Westerly (315-330°) storms for various return periods at Ardgour without reflection coefficient

	Berth 1			Berth 2			Berth End			Proposed Slipway			Existing Slipway		
Return Period	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**
1 in 0.1	0.19	2.85	50	0.41	2.23	350	0.52	2.71	22	0.49	2.72	24	0.50	2.72	21
1 in 1	0.32	3.50	51	0.73	2.98	356	0.87	3.29	14	0.83	3.37	24	0.84	3.37	21
1 in 10	0.43	3.89	52	0.97	3.35	356	1.14	3.66	14	1.08	3.74	24	1.12	3.71	17
1 in 50	0.51	4.20	53	1.15	3.62	356	1.34	3.85	13	1.27	3.89	20	1.32	3.91	17
1 in 100	0.56	4.29	54	1.24	3.73	356	1.45	3.99	13	1.36	4.05	20	1.42	4.08	17

Table 5.10: Wave climate parameters for South -South-Westerly (205-215°) storms for various return periods at Ardgour with reflection coefficient

	Berth 1			Berth 2			Berth End			Proposed Slipway			Existing Slipway		
Return Period	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**
1 in 0.1	0.26	1.25	205	0.19	1.10	212	0.22	1.69	163	0.29	1.49	186	0.28	1.49	178
1 in 1	0.46	1.57	206	0.36	1.44	217	0.39	2.13	163	0.51	1.85	186	0.50	1.85	174
1 in 10	0.62	1.77	206	0.49	1.62	217	0.52	2.40	162	0.69	2.06	186	0.66	2.12	172
1 in 50	0.75	1.90	205	0.59	1.75	217	0.63	2.57	162	0.82	2.19	185	0.77	2.32	167
1 in 100	0.81	1.96	205	0.64	1.80	217	0.68	2.66	162	0.89	2.26	185	0.83	2.41	165

Table 5.11: Wave climate parameters for South -South-Westerly (205-215°) storms for various return periods at Ardgour without reflection coefficient

	Berth 1			Berth 2			Berth End			Proposed Slipway			Existing Slipway		
Return Period	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)
1 in 0.1	0.22	1.20	177	0.16	1.01	220	0.21	1.69	166	0.27	1.44	178	0.28	1.46	174
1 in 1	0.39	1.51	179	0.31	1.37	227	0.39	2.12	163	0.48	1.78	178	0.48	1.81	172
1 in 10	0.53	1.71	179	0.42	1.55	227	0.53	2.39	163	0.65	1.96	178	0.64	2.07	170
1 in 50	0.64	1.83	179	0.51	1.67	227	0.63	2.57	162	0.78	2.10	178	0.75	2.27	166
1 in 100	0.70	1.90	179	0.55	1.72	227	0.69	2.66	162	0.84	2.15	178	0.80	2.37	161

Table 5.12: Wave climate parameters for South-Westerly (217-227°) storms for various return periods at Nether Lochaber with reflection coefficient

	Proposed Slipway			Existing Slipway			Breakwater South			Breakwater North		
Return Period	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)
1 in 0.1	0.36	4.30	247	0.81	4.16	224	0.87	4.22	218	0.26	4.27	267
1 in 1	0.63	3.64	255	1.16	4.31	226	1.26	4.55	220	0.47	3.55	273
1 in 10	0.85	2.73	257	1.43	4.17	229	1.53	4.53	221	0.64	2.87	275
1 in 50	1.01	2.93	257	1.62	4.23	230	1.71	4.52	222	0.76	3.00	276
1 in 100	1.09	3.04	258	1.72	4.27	230	1.81	4.53	222	0.82	3.12	276

Table 5.13: Wave climate parameters for South-Westerly (217-227°) storms for various return periods at Nether Lochaber without reflection coefficient

	Proposed Slipway			Existing Slipway			Breakwater South			Breakwater North		
Return Period	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)	Hm0 (m)	Tp (s)	MWD (°)
1 in 0.1	0.35	4.27	247	0.81	4.15	224	0.87	4.21	217	0.25	4.25	266
1 in 1	0.62	4.08	254	1.16	4.33	227	1.26	4.55	218	0.46	3.60	272
1 in 10	0.85	2.72	257	1.42	4.17	228	1.53	4.53	218	0.64	2.86	275
1 in 50	1.01	2.93	257	1.62	4.23	229	1.72	4.53	220	0.76	2.99	276
1 in 100	1.09	3.04	258	1.72	4.27	230	1.81	4.55	222	0.82	3.12	276

Table 5.14: Wave climate parameters for South-South Easterly (135-180°) storms for various return periods at Nether Lochaber with reflection coefficient

	Proposed Slipway			Existing Slipway			Breakwater South			Breakwater North		
Return Period	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**
1 in 0.1	0.18	3.50	237	0.52	3.37	223	0.52	3.35	217	0.12	3.64	254
1 in 1	0.30	4.08	241	0.76	3.97	223	0.82	4.01	216	0.20	4.10	260
1 in 10	0.38	4.32	242	0.91	4.20	224	1.02	4.24	216	0.26	4.28	262
1 in 50	0.44	4.49	243	1.02	4.32	224	1.15	4.36	215	0.30	4.38	263
1 in 100	0.48	4.60	243	1.08	4.39	225	1.22	4.44	215	0.32	4.46	263

Table 5.15: Wave climate parameters for South-South Easterly (135-180°) storms for various return periods at Nether Lochaber without reflection coefficient

	Proposed Slipway			Existing Slipway			Breakwater South			Breakwater North		
Return Period	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**
1 in 0.1	0.18	3.47	237	0.52	3.36	223	0.52	3.34	217	0.12	3.61	254
1 in 1	0.36	4.06	217	0.75	3.97	223	0.82	4.00	216	0.20	4.09	260
1 in 10	0.47	4.31	224	0.91	4.20	224	1.02	4.24	216	0.31	4.27	239
1 in 50	0.54	4.47	225	1.02	4.32	224	1.15	4.35	215	0.38	4.22	231
1 in 100	0.57	4.59	225	1.08	4.40	224	1.22	4.44	215	0.41	4.29	231

Table 5.16: Wave climate parameters for North-Easterly (30-40°) storms for various return periods at Nether Lochaber with reflection coefficient

	Proposed Slipway			Existing Slipway			Breakwater South			Breakwater North		
Return Period	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**
1 in 0.1	0.48	2.97	5	0.43	2.99	2	0.30	2.99	333	0.50	2.98	7
1 in 1	0.76	3.54	1	0.72	3.54	1	0.47	3.81	325	0.79	3.61	4
1 in 10	0.96	3.91	358	0.93	3.87	1	0.62	4.22	321	1.01	4.00	2
1 in 50	1.12	4.21	356	1.10	4.16	360	0.71	4.58	318	1.18	4.26	0
1 in 100	1.19	4.31	356	1.18	4.24	359	0.76	4.72	317	1.26	4.38	359

Table 5.17: Wave climate parameters for North-Easterly (30-40°) storms for various return periods at Nether Lochaber without reflection coefficient

	Proposed Slipway			Existing Slipway			Breakwater South			Breakwater North		
Return Period	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**
1 in 0.1	0.48	2.97	5	0.43	2.99	2	0.30	2.98	334	0.49	2.98	7
1 in 1	0.75	3.53	2	0.72	3.55	1	0.46	3.80	327	0.79	3.60	4
1 in 10	0.96	3.89	359	0.94	3.88	1	0.61	4.20	323	1.01	3.99	2
1 in 50	1.11	4.20	357	1.10	4.17	360	0.70	4.56	320	1.18	4.25	1
1 in 100	1.18	4.29	357	1.19	4.25	359	0.74	4.70	319	1.26	4.36	0

Table 5.18: Wave climate parameters for North-Westerly (315-330°) storms for various return periods at Nether Lochaber with reflection coefficient

	Proposed Slipway			Existing Slipway			Breakwater South			Breakwater North		
Return Period	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**
1 in 0.1	0.51	2.41	333	0.48	2.42	336	0.40	2.34	311	0.51	2.41	335
1 in 1	0.84	2.95	331	0.81	3.00	337	0.65	2.85	307	0.84	2.97	334
1 in 10	1.10	3.29	328	1.07	3.35	336	0.87	3.21	304	1.09	3.32	333
1 in 50	1.29	3.46	327	1.27	3.54	336	1.02	3.42	302	1.29	3.50	333
1 in 100	1.39	3.62	326	1.37	3.70	335	1.10	3.53	301	1.39	3.67	332

Table 5.19: Wave climate parameters for North-Westerly (315-330°) storms for various return periods at Nether Lochaber without reflection coefficient

	Proposed Slipway			Existing Slipway			Breakwater South			Breakwater North		
Return Period	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**
1 in 0.1	0.51	2.41	333	0.48	2.42	335.32	0.39	2.34	311	0.50	2.41	335
1 in 1	0.84	2.96	330	0.81	3.00	335.79	0.64	2.86	307	0.83	2.98	334
1 in 10	1.09	3.30	328	1.08	3.35	334.96	0.85	3.22	304	1.09	3.33	333
1 in 50	1.28	3.47	327	1.28	3.55	334.29	1.00	3.43	302	1.28	3.51	332
1 in 100	1.37	3.63	326	1.38	3.71	334.00	1.08	3.54	301	1.38	3.68	332

Table 5.20: Wave climate parameters for South -South-Westerly (205-215°) storms for various return periods at Nether Lochaber with reflection coefficient

	Proposed Slipway			Existing Slipway			Breakwater South			Breakwater North		
Return Period	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**
1 in 0.1	0.33	4.22	243	0.79	4.12	224	0.85	4.17	217	0.22	4.21	262
1 in 1	0.57	4.76	249	1.15	4.35	226	1.26	4.53	218	0.41	4.45	268
1 in 10	0.76	4.71	250	1.41	4.22	227	1.52	4.52	218	0.53	3.68	269
1 in 50	0.90	4.34	250	1.61	4.27	228	1.71	4.52	219	0.63	3.74	270
1 in 100	0.98	4.31	249	1.71	4.31	228	1.80	4.54	219	0.68	3.77	270

Table 5.21: Wave climate parameters for South -South-Westerly (205-215°) storms for various return periods at Nether Lochaber without reflection coefficient

	Proposed Slipway			Existing Slipway			Breakwater South			Breakwater North		
Return Period	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**	**Hm0 (m)**	**Tp (s)**	**MWD (°)**
1 in 0.1	0.32	4.20	243	0.79	4.11	224	0.85	4.16	217	0.22	4.20	262
1 in 1	0.57	4.75	249	1.15	4.35	226	1.26	4.53	218	0.41	4.44	268
1 in 10	0.76	4.71	250	1.41	4.22	227	1.52	4.53	218	0.53	3.68	269
1 in 50	0.90	4.35	250	1.61	4.27	227	1.71	4.53	218	0.63	3.74	270
1 in 100	0.98	4.33	250	1.71	4.31	228	1.81	4.55	219	0.68	3.77	270

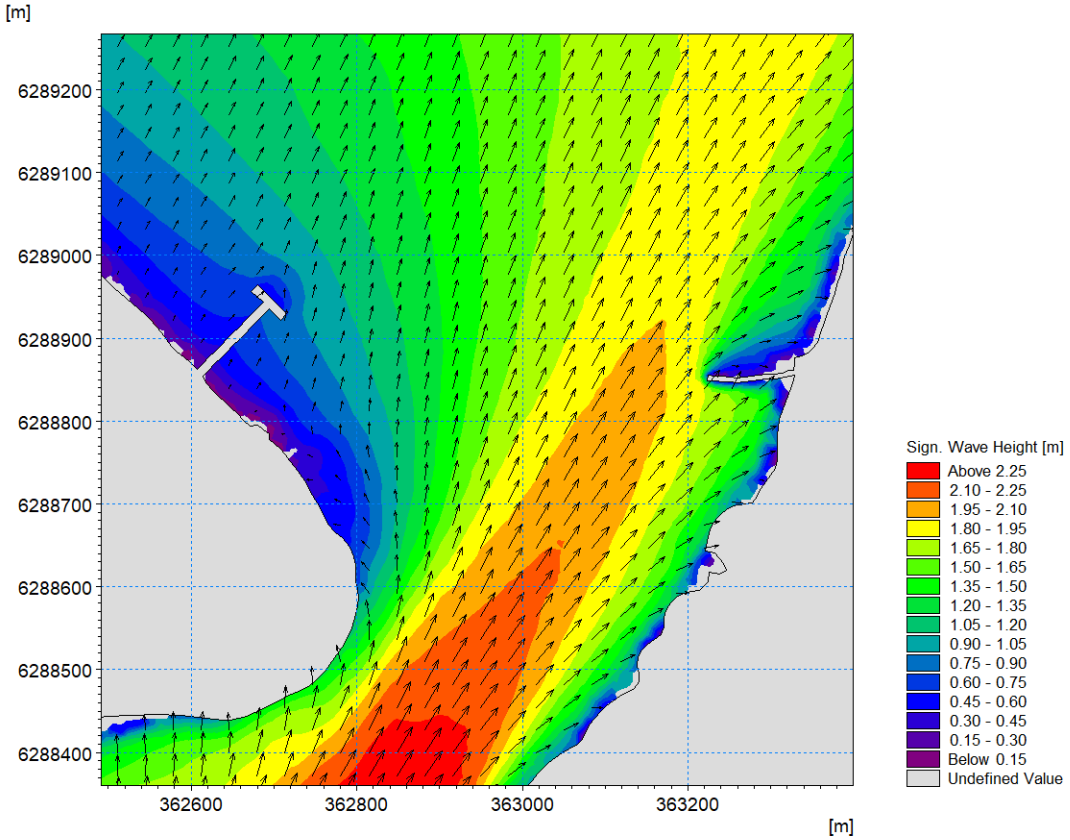

Figure 5.10: South Westerly (215°) 1 in 100 Storm Event at Mean High Water Springs with no reflection coefficients on structures

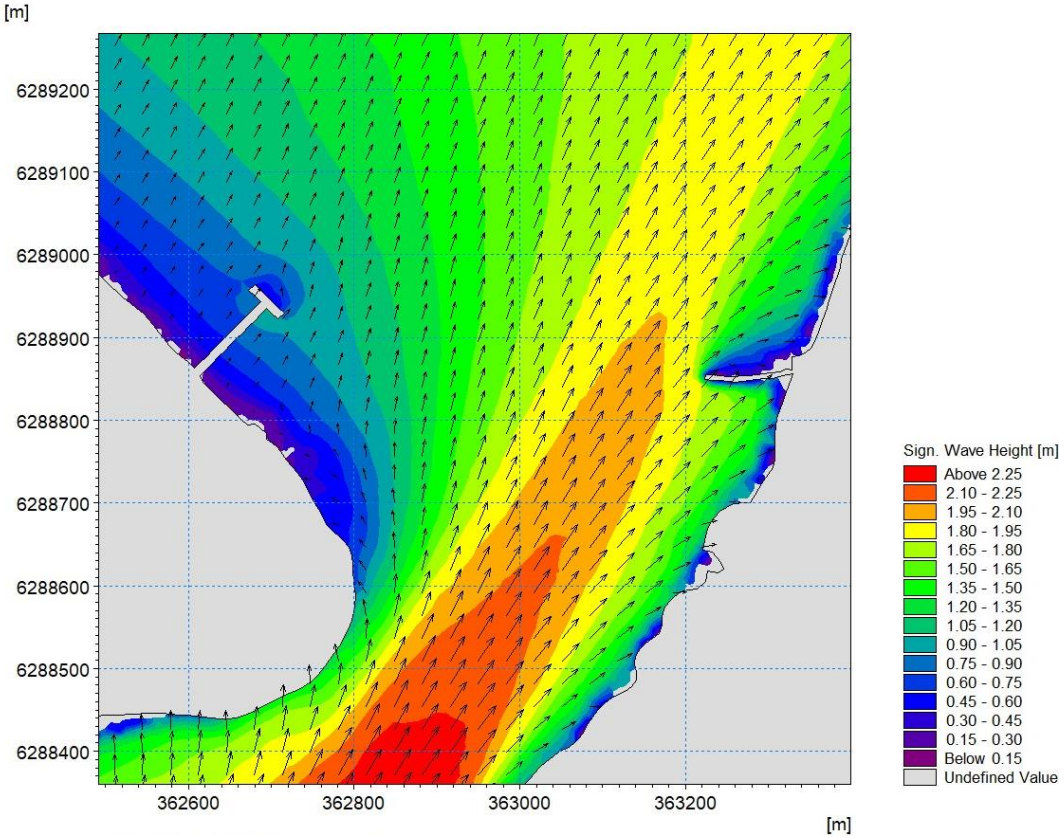

Figure 5.11: South Westerly (215°) 1 in 100 Storm Event at Mean High Water Springs with reflection coefficients on structures

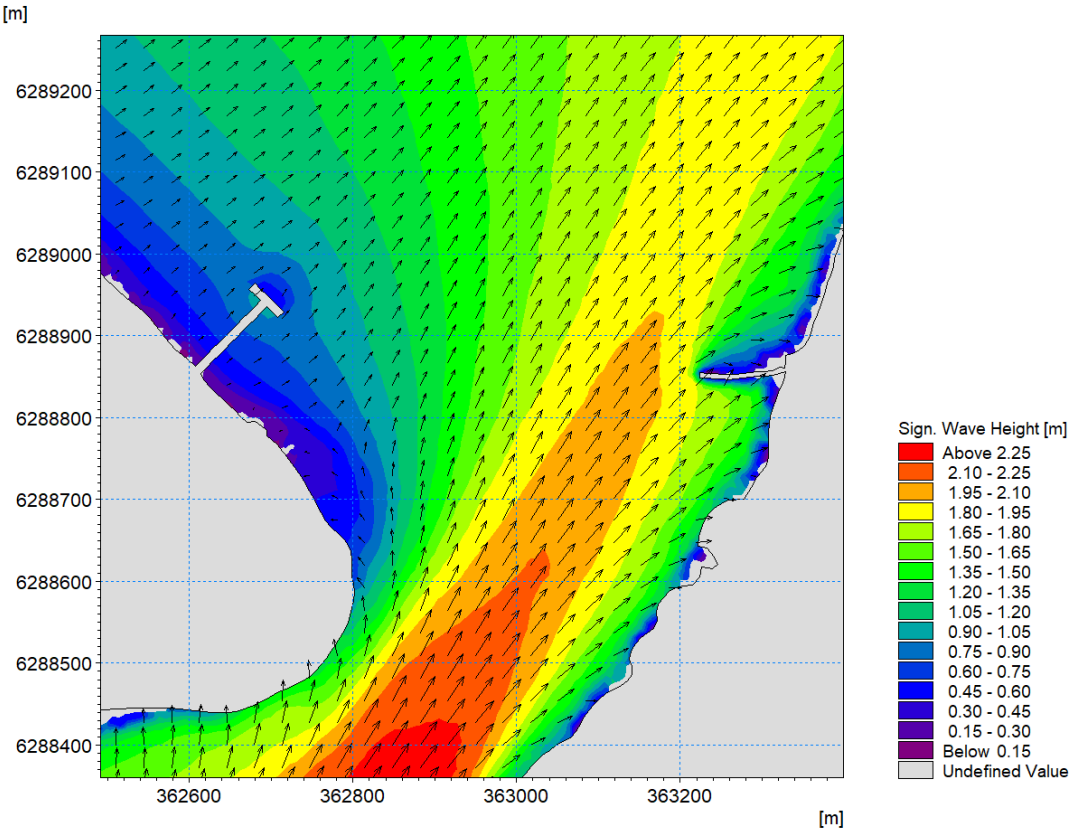

Figure 5.12: South Westerly (227°) 1 in 100 Storm Event at Mean High Water Springs with reflection coefficients on structures

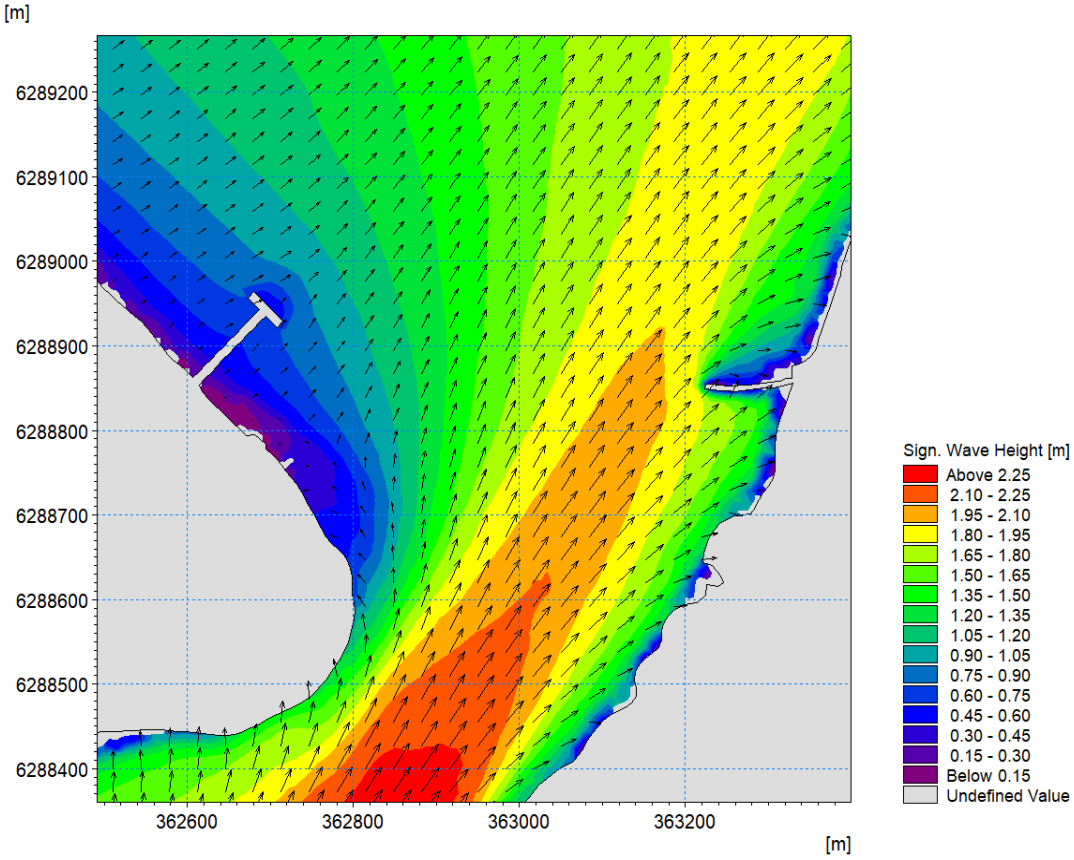

Figure 5.13: South Westerly (227°) 1 in 100 Storm Event at Mean High Water Springs with no reflection coefficients on structures

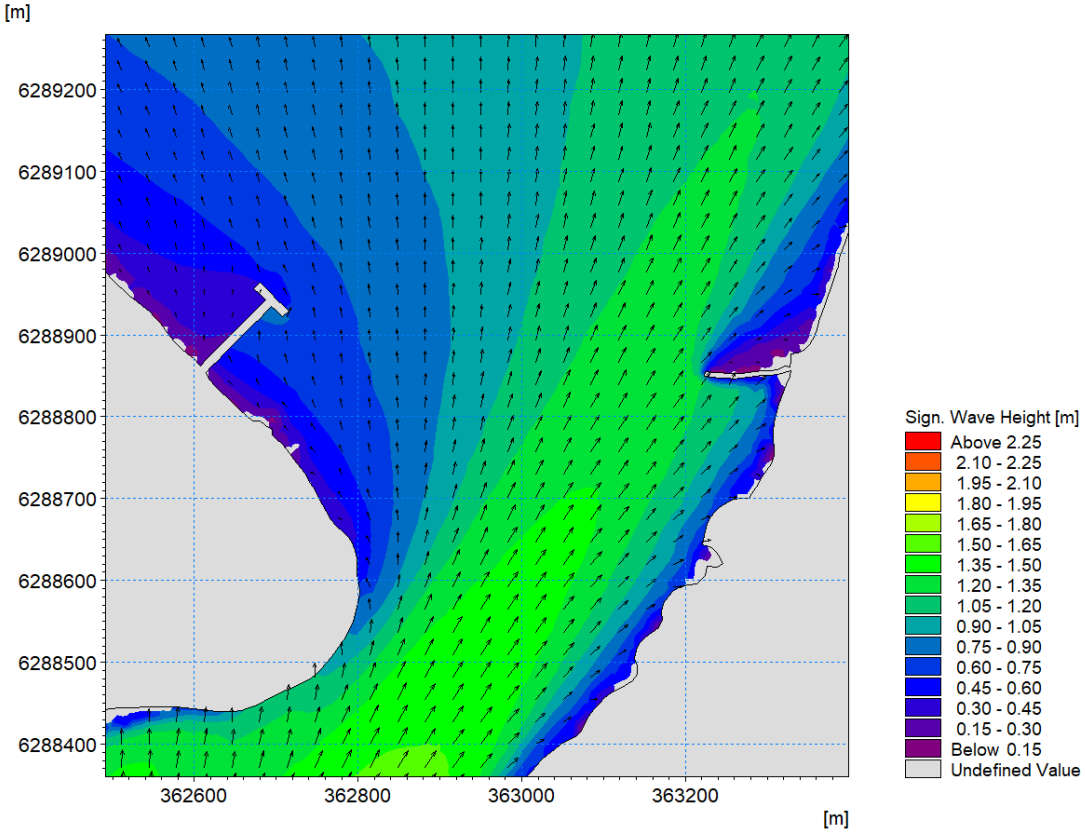

Figure 5.14: Southerly (180°) 1 in 100 Storm Event at Mean High Water Springs with reflection coefficients on structures

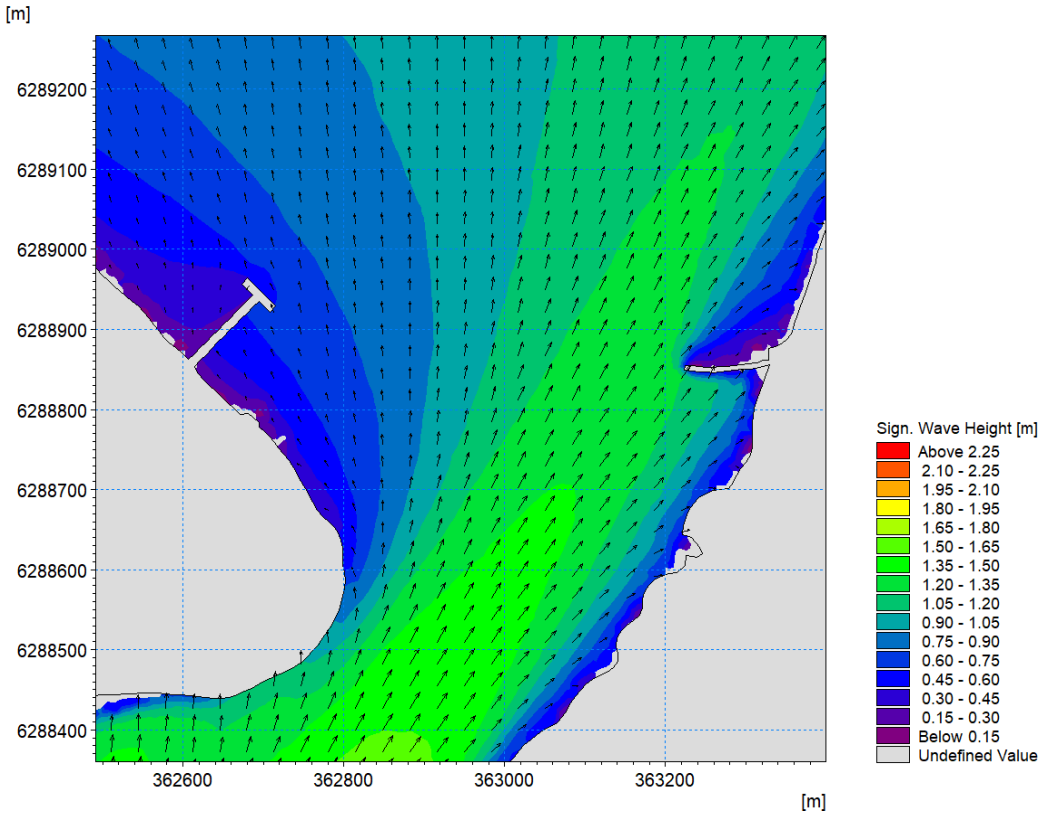

Figure 5.15: Southerly (180°) 1 in 100 Storm Event at Mean High Water Springs with no reflection coefficients on structures

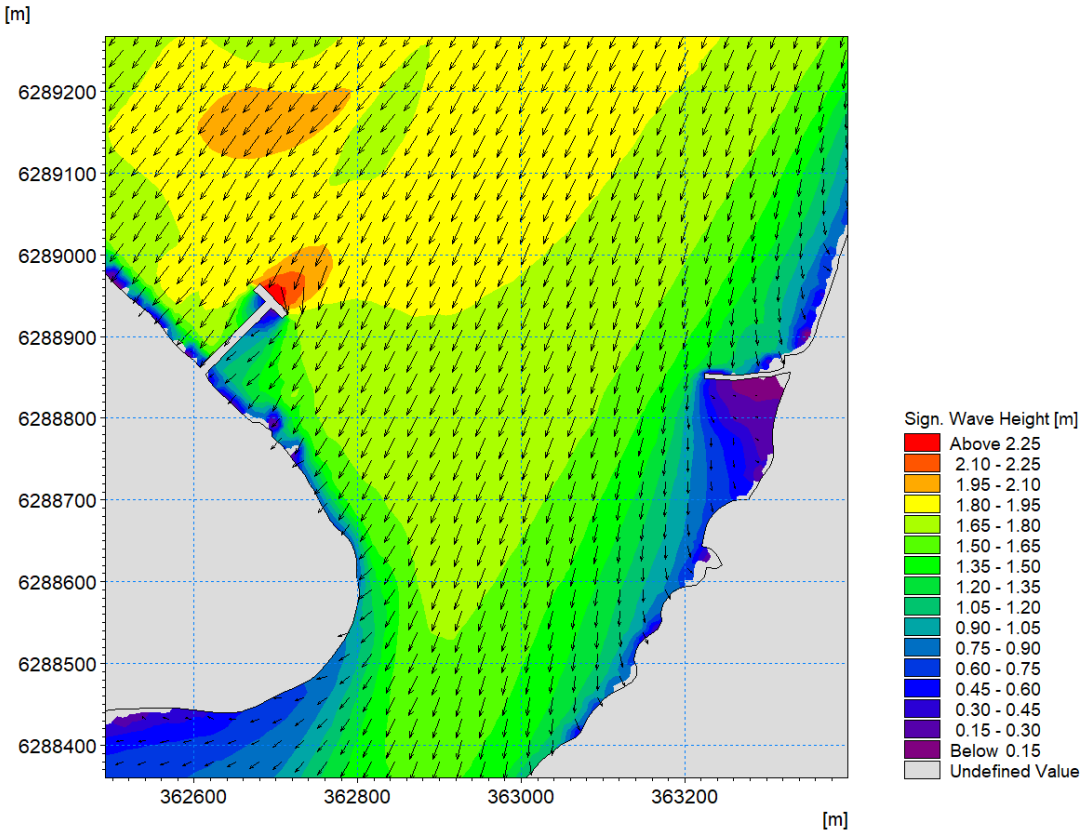

Figure 5.16: North Easterly (40°) 1 in 100 year Storm Event at Mean High Water Springs with reflection coefficients on structures

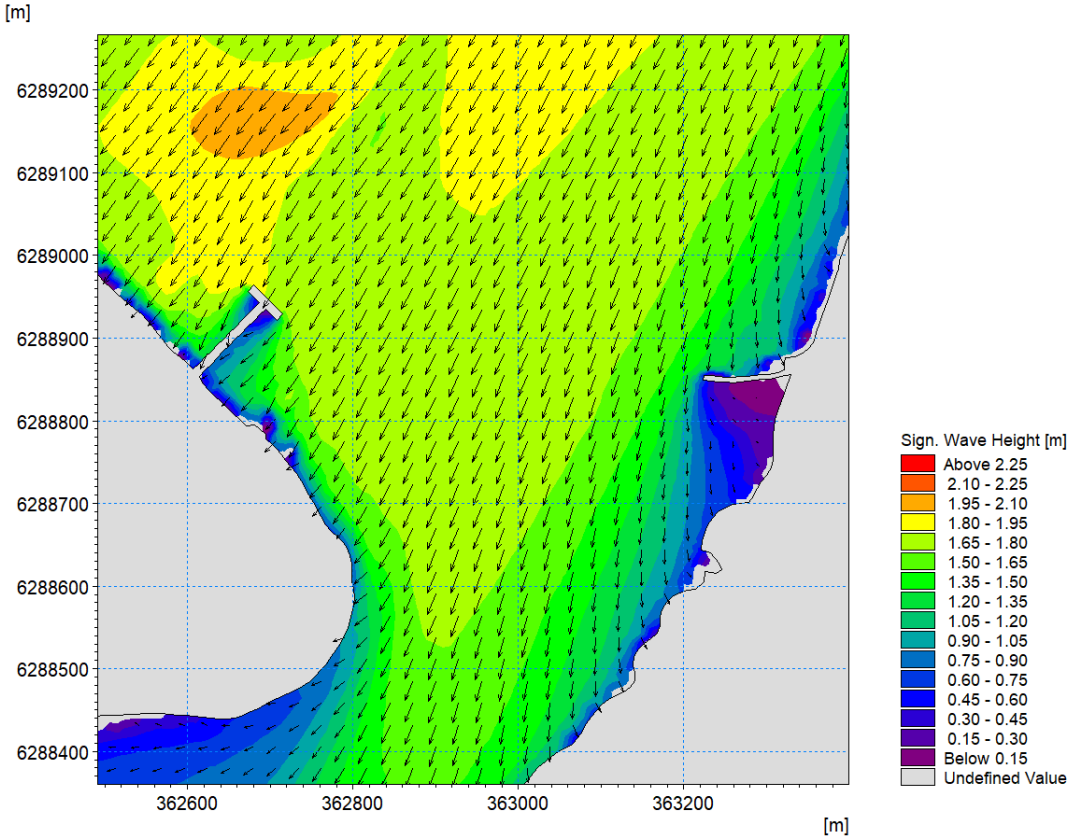

Figure 5.17: North Easterly (40°) 1 in 100 year Storm Event at Mean High Water Springs with no reflection coefficients on structures

5.2.1 Downtime Analysis

During marine operations, the ferry may experience excessive movement on the slipway berth, which can restrict the operation of loading or unloading, a period known as downtime. In some scenarios, the overnight berth may become unsafe and lead to a vessel being evacuated from its berth, which is also considered downtime. Such incidents can result in considerable disruption and potential economic loss for the owners/operators of the terminal facilities and agents etc as well as reductions in safety levels.

To investigate potential downtime on ferry operations at the sites considered in this study, RPS simulated the long-term wave climate within the Corran Narrows based on 20 years of wind data from the Climate Forecast System Reanalysis (CFSR) as described in Section 2.2. The downtime analyses at both Nether Lochaber and Ardgour based on a significant wave height threshold of 0.8m is summarised in Table 5.22. The 0.8m wave height is the indicative wave height at the slipway berths which are advised, by the client, as resulting in service suspension on the existing slipway infrastructure.

Table 5.22: Summary of the downtime analyses at Nether Lochaber and Ardgour based on a 0.8m significant wave height threshold and a 20 year analyses of wind driven wave data

			Nether Lochaber		Ardgour	
Sector	Direction	Represents	Slipway (Existing)	Slipway (Proposed)	Slipway (Existing)	Slipway (Proposed)
SW	217-227	195 - 245	0.47823%	0.00000%	0.00000%	0.00000%
S - SE	137 - 180	n/a	0.00000%	0.00000%	0.00000%	0.00000%
NE	30 - 40	0 - 60	0.00000%	0.00313%	0.00730%	0.00965%
NW	315 - 330	315 - 0	0.00052%	0.00078%	0.00026%	0.00052%
		Subtotal	0.47875%	0.00391%	0.00756%	0.01017%

Based on this assessment and a wave threshold of 0.8m, it was found that with the current configuration of Nether Lochaber and Ardgour, it was reasonable to expect approximately 0.48632% of downtime per year, which equates to *c.* 42.60 hours. This correlates relatively well with anecdotal evidence which indicates that weather-based disruptions accounts for approximately 4 to 5 days per year.

The downtime experienced within the proposed configurations in place was reduced to 0.01408% per year, which is equivalent to 1.23 hours. This represents a significant reduction in the downtime with the new slipways compared to that with the existing slipways.

This improvement can be attributed to the wave protection provided by the breakwater on the southwestern side of the new Nether Lochaber slipway which is assumed to be effective in protecting the berth from the most critical south westerly waves. For the Ardgour slipway, the new facilities generally have a slightly increased down time compared to the old Ardgour slipway mainly because the new slipway projects into deeper water.

5.3 Sediment and Marine Detritus Transport

5.3.1 Sediment Sorting

Sediment sorting in narrow and tidal water channels such as the Corran Narrows is a dynamic process influenced by the flow velocity and energy of the water. In these environments, the water's speed and force vary significantly, especially during turning tides. Faster-moving water has the energy to carry smaller, lighter particles like sand and silt away from the channel, leaving behind larger, heavier sediments such as rocks and gravel. This process, known as hydraulic sorting, occurs because larger particles require more energy to be transported, so they settle quickly when the water's velocity decreases.

As a result, narrow and tidal channels often exhibit a sediment profile where coarser materials accumulate within the channel, creating a bed of larger rocks and sediments that withstand the erosive forces of the flowing water (Figure 5.18). This natural sorting is present in the Corran Narrows. This was evident in the Ground Investigation as 86% of the particles were classed as sands and gravels, with most of the gravels likely to be on the seabed surface (Table 5.23).

The littoral current modelling during a 1 in 1 year south-westerly storm found the critical bed shear stress values (Table 5.23) in the main channel to be 10 to 11 N/m^2 during the flood tide. This suggests only a small amount of sand would be present on the channel's seabed surface as sand particles would repeatedly be mobilised and transported elsewhere. Critical shear stress values (<1.3N/m^2) are present closer to the Ardgour shoreline and suggests that the sand and smaller fractions of the bed sediments on the surface could be disturbed during a storm event.

Figures 5.15 and 5.17 show the littoral currents around Corran Narrows during a 1 in 1 year return period southwest storm. The figures show the currents during mid ebb and at a time around high water. These flow figures demonstrate that the littoral currents are dominated by the tidal flows, where the peak velocities are of the order of 2.5m/s, while the wave driven currents only occur near the shoreline with value of about 0.3 m/s. A similar picture is shown for the littoral currents during a 1 in 1 year return period storm from the northwest in Figures 5.18 and 5.19. In this case the effect of the waves is to form wave driven currents close along the shoreline at Ardgour with current speeds of about 0.3m/s. The proposed new overnight berth will obstruct these flows (see Figure 5.19) and force the flow out along the face of the pier.

Although the littoral currents are obstructed by the overnight berth for part of the tidal cycle during certain storm conditions, the current velocities and waves in this area are small such that only the finer fractions of the sediment are moved by the hydrodynamic forces. As described above and shown in Figure 5.15, the widely graded nature of the sediments in this area means the surface of the beach will become armoured with the larger fractions of the sediment and sediment transport will be curtailed.

During south westerly storms the wave driven currents will flow north along the Nether Lochaber shoreline where the bed is mainly formed of rock. This combined with the low wave current velocity means that there will be little or no sediment transport taking place due to the wave driven currents along the Nether Lochaber shoreline. Overall, the sediment transport in the area is dominated by the strong tidal currents in the study area and as these tidal currents have been flowing for millennia, the seabed has adapted to be stable under this high current regime. As the proposed works make little or no significant change to the overall tidal regime, the proposed works are not expected to result in any significant impact on the sediment transport or morphology of the Corran Narrows area.

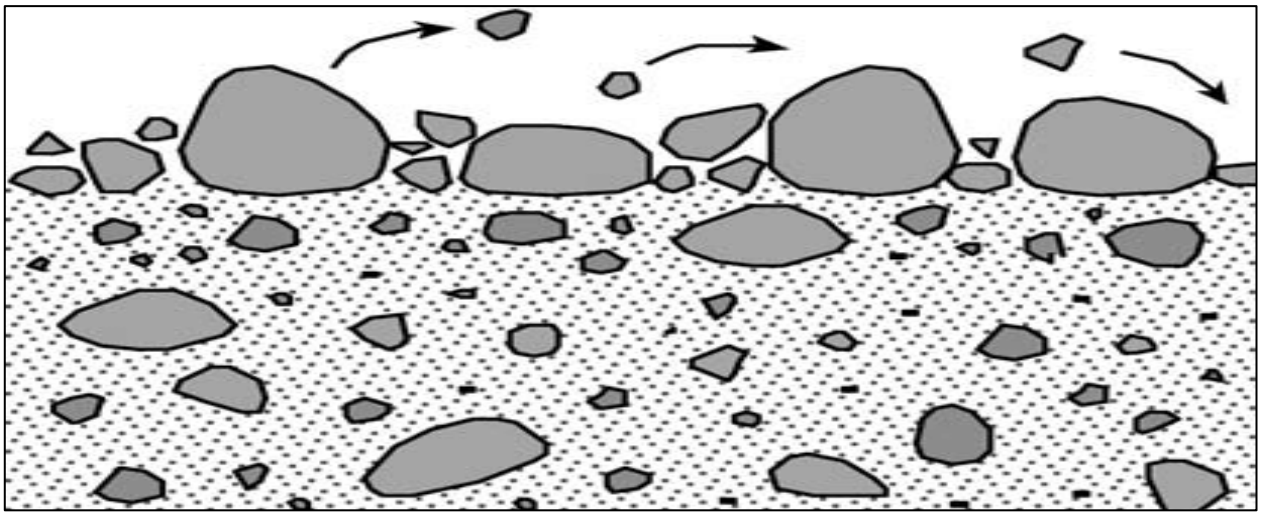

Figure 5.18: Distinction between the bed surface layer (armour) and the substrate (Pitlick *et al*., 2009).

Table 5.23 Percentage size of seabed in Corran Narrows from Ground Investigation

Sediment Type	Typical particle diameter (mm)	Critical bed shear stress (N/m^2)	Proportion of seabed (%)
Cobbles	64 - 256	53.8 - 223	6
Gravel	2 - 64	1.3 – 53.8	45
Sand	0.0625 - 2	0.11 - 1.3	41
Silt	0.0078 - 0.0625	0.0378 - 0.11	8

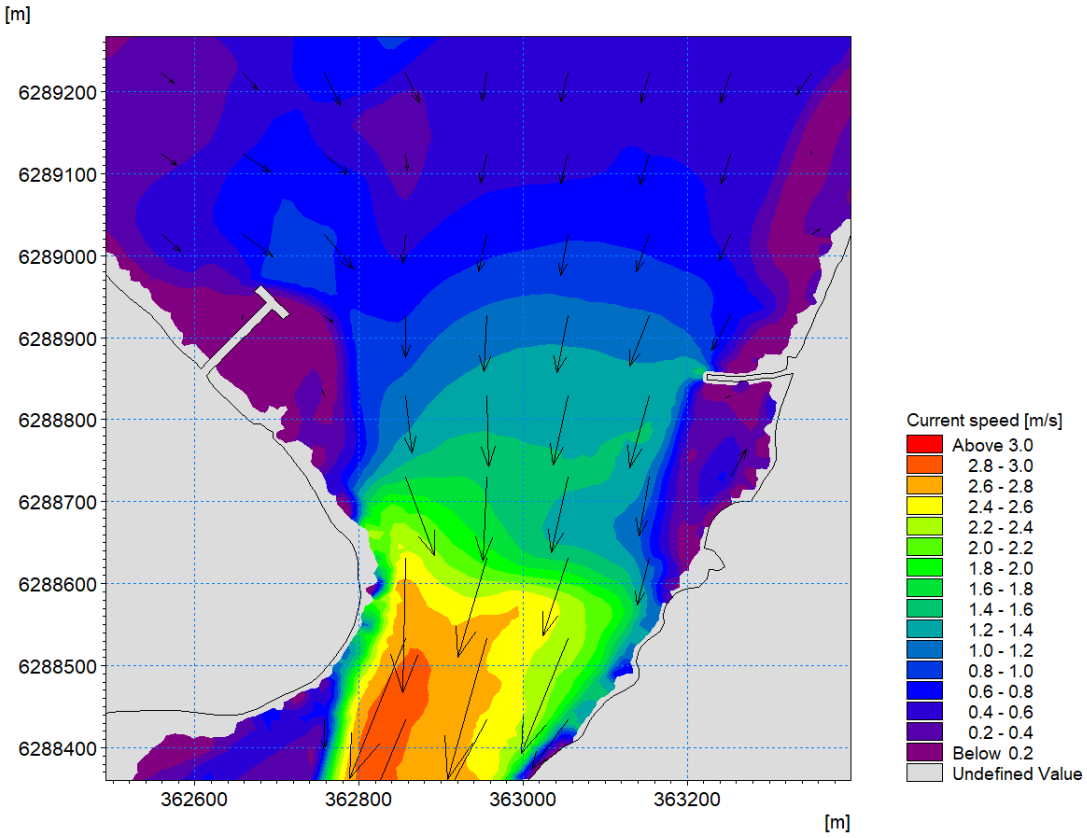

Figure 5.19: South Westerly 1 in 1 Year Storm Littoral Currents during ebb tide

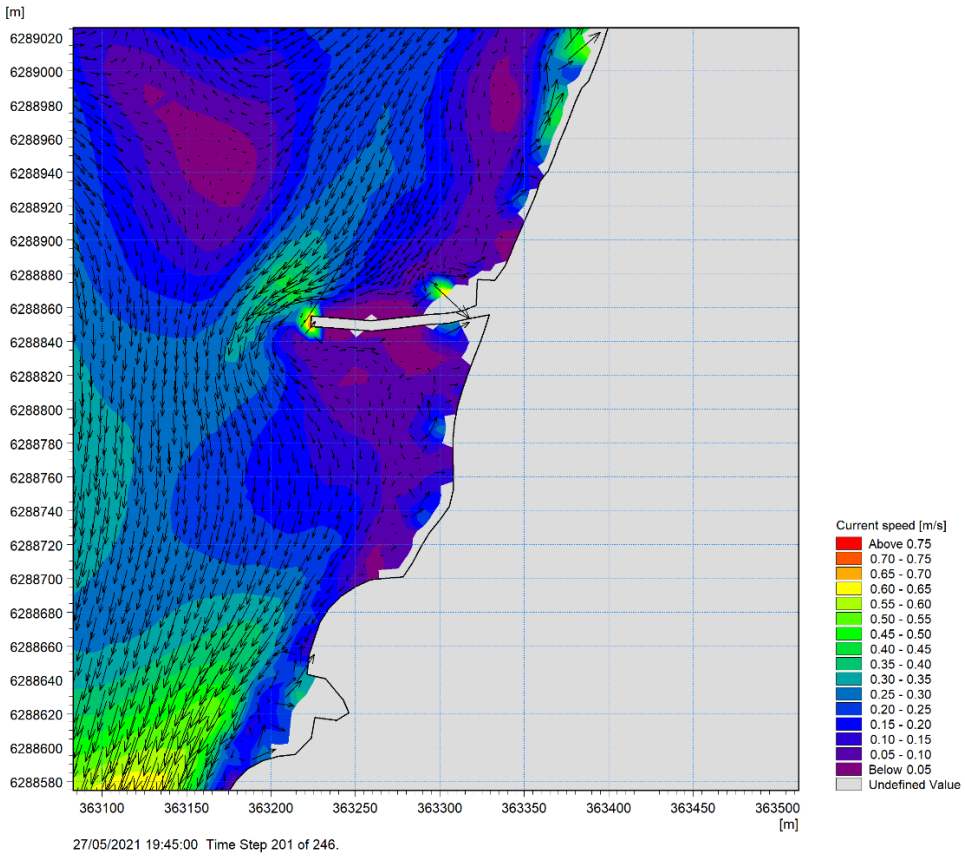

Figure 5.20: South Westerly 1 in 1 Year Storm Littoral Currents near High Water

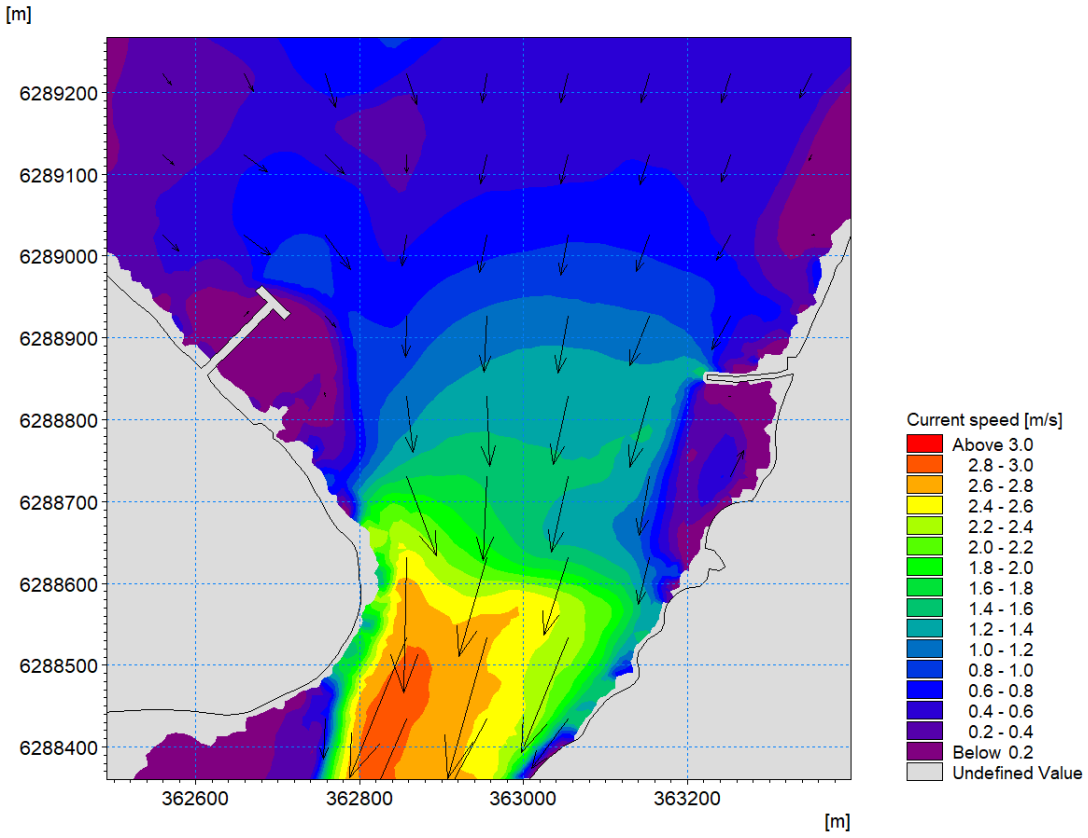

Figure 5.21: North Westerly 1 in 1 Year Storm Littoral Currents during ebb tide

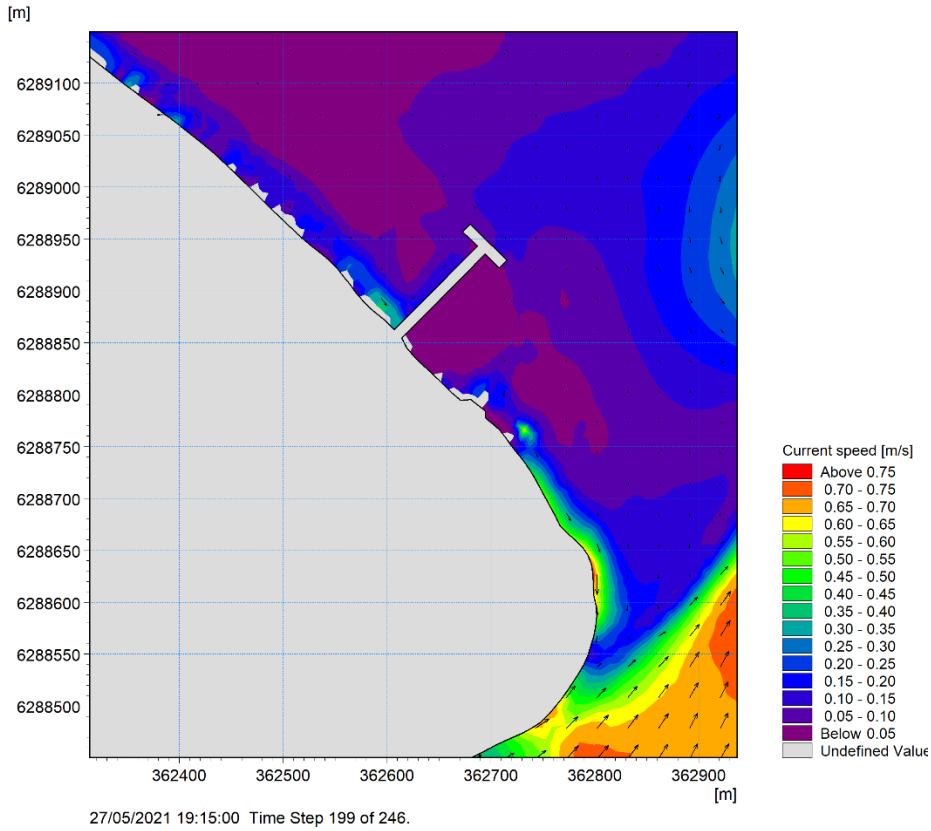

Figure 5.22: North Westerly 1 in 1 Year Storm Littoral Currents near High Tide

5.3.2 Stokes Drift

Stokes drift is a phenomenon in fluid dynamics where particles (often marine detritus) in a wave field experience a net movement in the direction of wave propagation. This occurs because particles in a fluid, such as water, follow circular orbits in wave motion, moving forward slightly more during the crest phase than they move backward during the trough phase. This results in a small but cumulative forward drift over time (Figure 5.23). Seaweed movement is influenced by Stokes drift as the oscillatory motion of waves causes the seaweed to experience this net drift. While the seaweed appears to move back and forth with the waves, it gradually drifts in the direction the waves are travelling. This movement can cause seaweed to accumulate at structures such as the proposed breakwater at Nether Lochaber which may occur as a result of storm events.

Figure 5.24 and Figure 5.25 shows the Stoke's drift observed during a south-westerly and north-westerly 1 in 1 year storm. The direction of the drift represents the direction of marine detritus and the estimated location of deposition. Figure 5.24 shows that marine detritus will likely be deposited between the shoreline and the southern face of the breakwater. Figure 5.25 shows the western side of the proposed berth at Ardgour could potentially catch marine detritus or the proposed slipway at Nether Lochaber on the north side of the breakwater. RPS is of the view that marine detritus can be managed on an ad hoc basis.

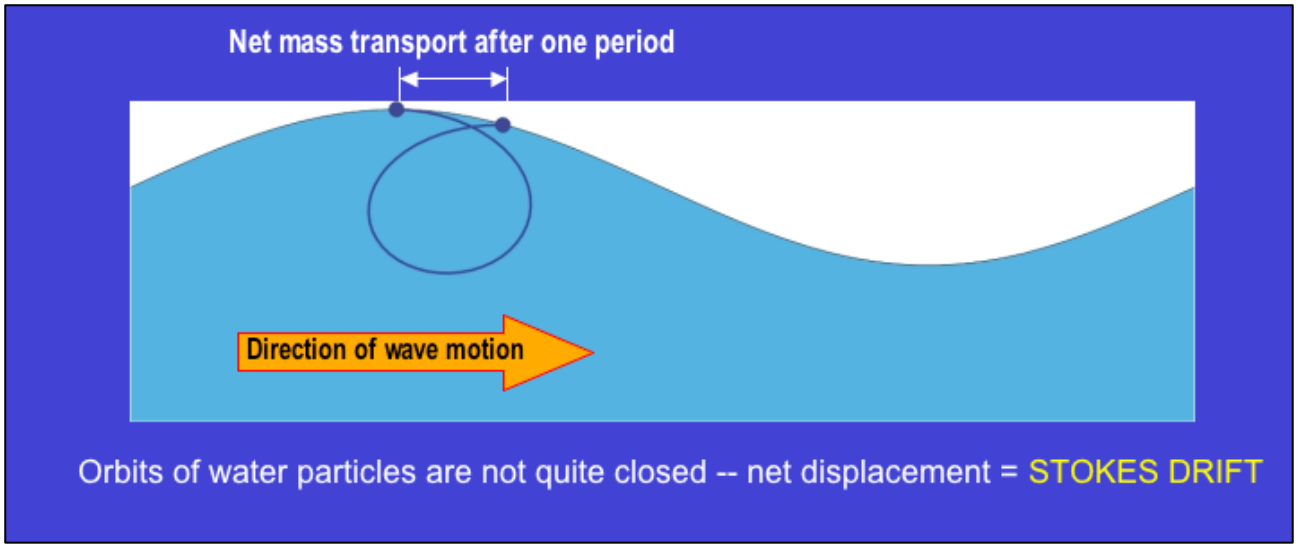

Figure 5.23: Path line of a water particle and definition of the Stokes drift (Source: Denison-University, 2014).

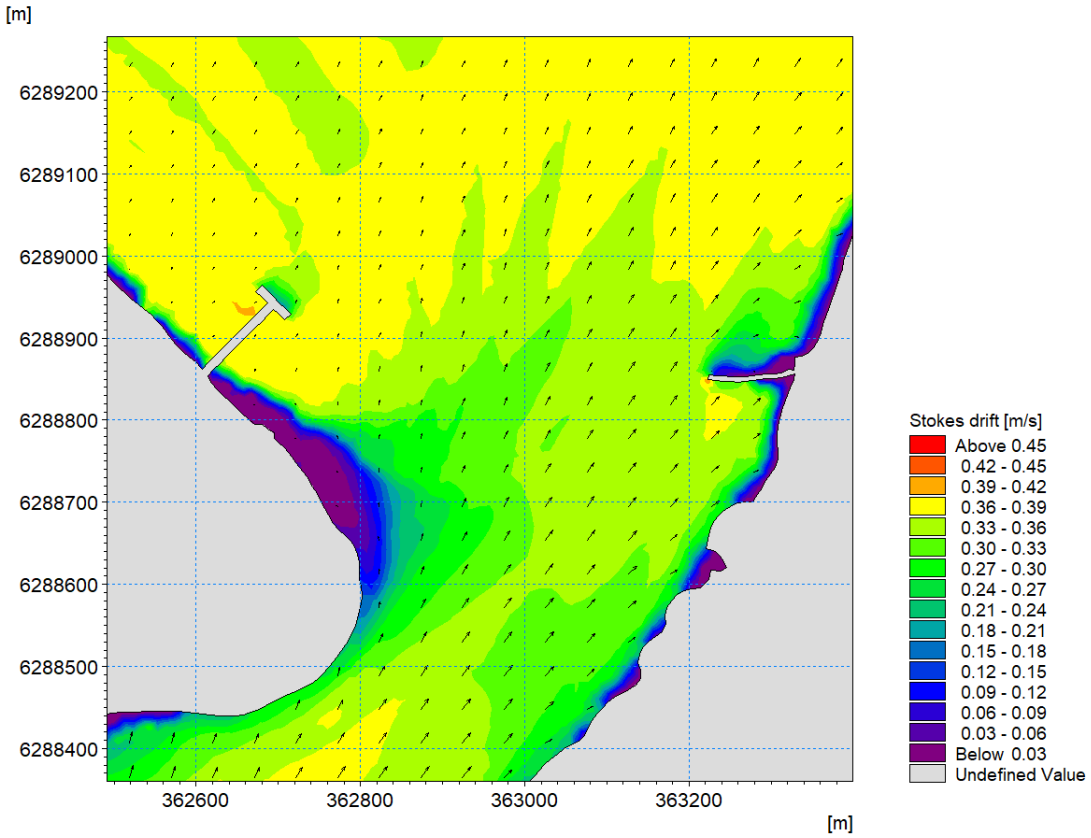

Figure 5.24: South Westerly 1 in 1 Year Storm Stokes Drift

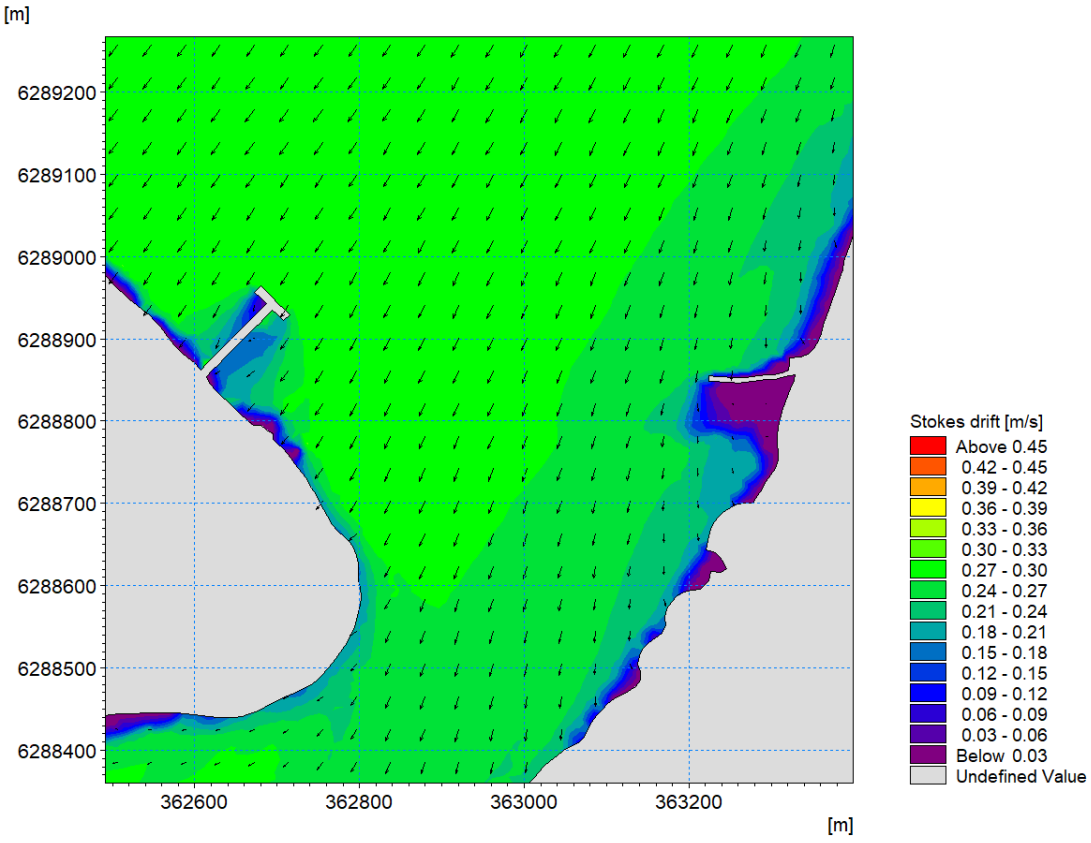

Figure 5.25: North Easterly 1 in 1 Year Storm Stokes Drift

6 CONCLUSION

A modelling study was conducted to evaluate and quantify changes in coastal processes resulting from the proposed ferry infrastructure at the Corran Narrows (Section 5). This study included extensive tide, wave, and sediment transport modelling. The computational modelling was performed using RPS's in-house suite of MIKE coastal process modelling software developed by DHI.

Several options were assessed and modelled during the design phase, evaluating a series of structures. All these designs also included new slipways for ferry loading/unloading, which were reflected in the model bathymetry. The preferred design was ultimately a solid, shorter pier overnight berth on the west side, with a new breakwater protecting the slipway on the east side. This design also included two new slipways for ferry loading/unloading with the existing slipway at Ardgour to be retained. The full results of the modelling for the preferred design are summarised below.

For tidal velocity and direction, little change was observed during slack water (high and low tide). As expected, small changes were observed during mid-flood and mid-ebb, which experienced the fastest tidal flow through the Corran Narrows. On the eastern side, current velocity was reduced behind the breakwater but increased outside the breakwater's outer toe. The resulting sharp change in current speed as the ferry enters behind the breakwater on the flood tide means different tidal velocities will act on different parts of the vessel during its approach. The ferry operator will need to be aware of this change when manoeuvring. On the western side, the current is reduced behind the overnight berth pier as expected, but the structure slightly increases the velocity of the eddy that circles the western shore on the flood tide.

As per the design of the pier and breakwater, reductions in significant wave height were observed during northerly and southerly storm events. The southerly storm events create slightly higher wave heights due to the longer fetch from the south end of Loch Linnhe. However, the breakwater design adequately attenuates approaching waves and prevents significant wave diffraction around the breakwater onto the eastern slipway. It should be noted that the western berth is naturally protected by the land during southerly events. Waves from northern events approach the slipway from an unprotected direction, but wave heights are in the range of 1 m at the slipway for a 1 in 100-year storm event. Higher wave heights were observed locally around the berthing structure as a result of wave reflection from the vertical pier walls.

Due to natural sorting of sediments in the Corran Narrows, larger granular sediment is present and requires more energy to mobilise. This means the area is less sensitive to changes in the sediment transport regime. Localised sediment transport would likely take place around the shoreline during storm events due to wave action causing suspension of sediment, but the amount is relatively small. Stokes drift was also considered during storms, and it is expected that any suspended seaweed would be transported by wave action coupled with tide velocities. Thus, seaweed may become trapped to the west of the overnight berth structure and to the south of the Nether Lochaber slipway breakwater.

Overall, there is very little change in current velocity across the study area, with changes being localised around the structure. A change in wave climate is expected locally around the Nether Lochaber slipway breakwater and the overnight berthing pier at Ardgour. However, these changes are local to the structures and overall, there is no significant change expected in the wave climate of the area away from the immediate proximity of these structures. Similarly, the modelling shows that the proposed scheme will have no significant impact on the sediment transport regime away from the immediate area of the root of the overnight berth. Depending upon the storm direction, seaweed is likely to become trapped on the southern side of the Nether Lochaber slipway breakwater and near the shoreline on the western side of the overnight berthing pier.

A.1 Model Validation

The model was verified by comparison with tidal heights and current velocity across the domain and measured Acoustic Doppler Current Profile (ADCP) data, the location of which is indicated in Figure A.6.1. The model runs show good agreement with the measured current speed, tidal height and phasing. Figure A.6.2 and Figure A.6.3 display the modelled and measured surface elevation and current velocity for spring and neap tides.

Figure A.6.1: Location of ADCP Data collected.

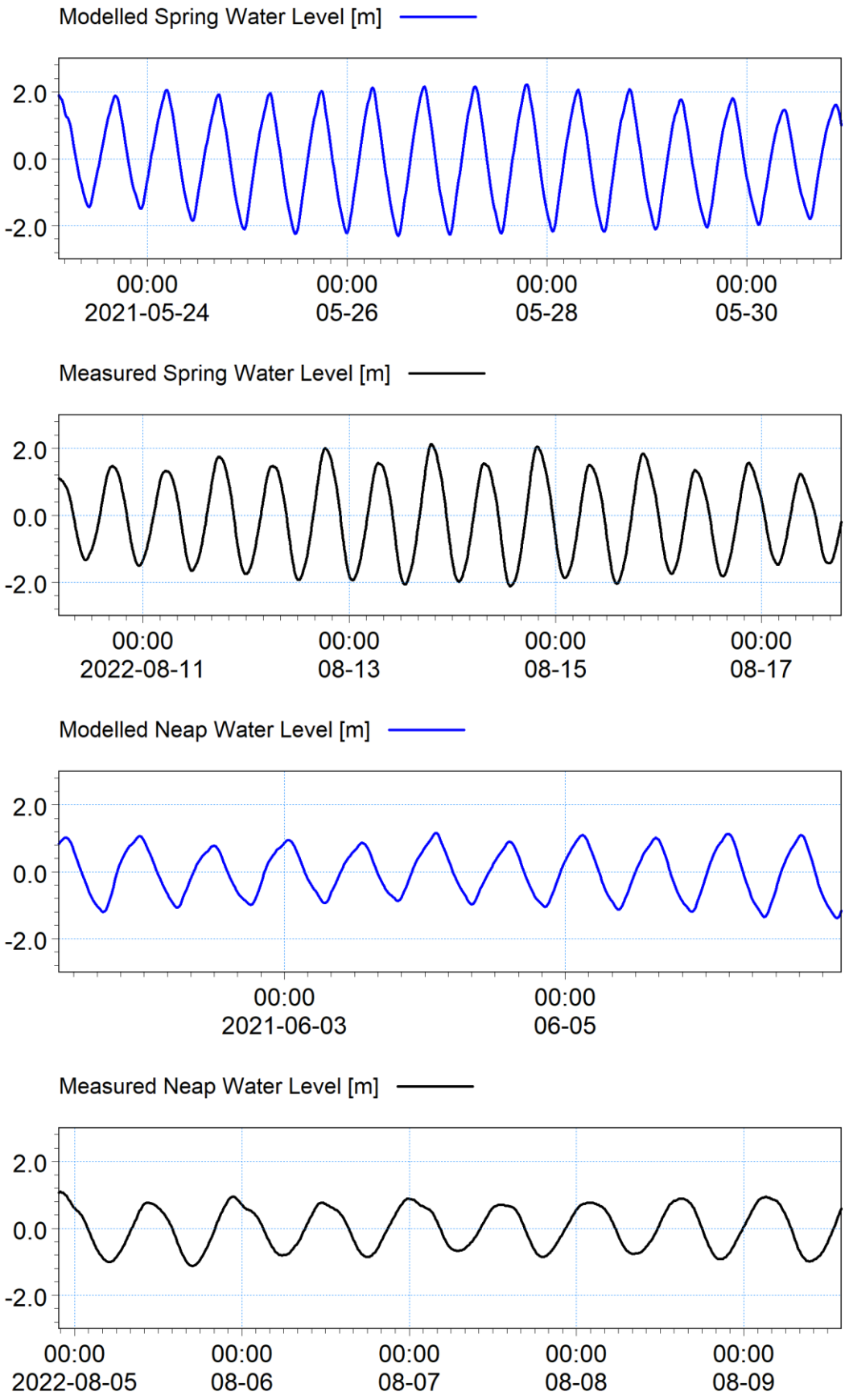

Figure A.6.2: Measured and modelled water level for spring and neap tides

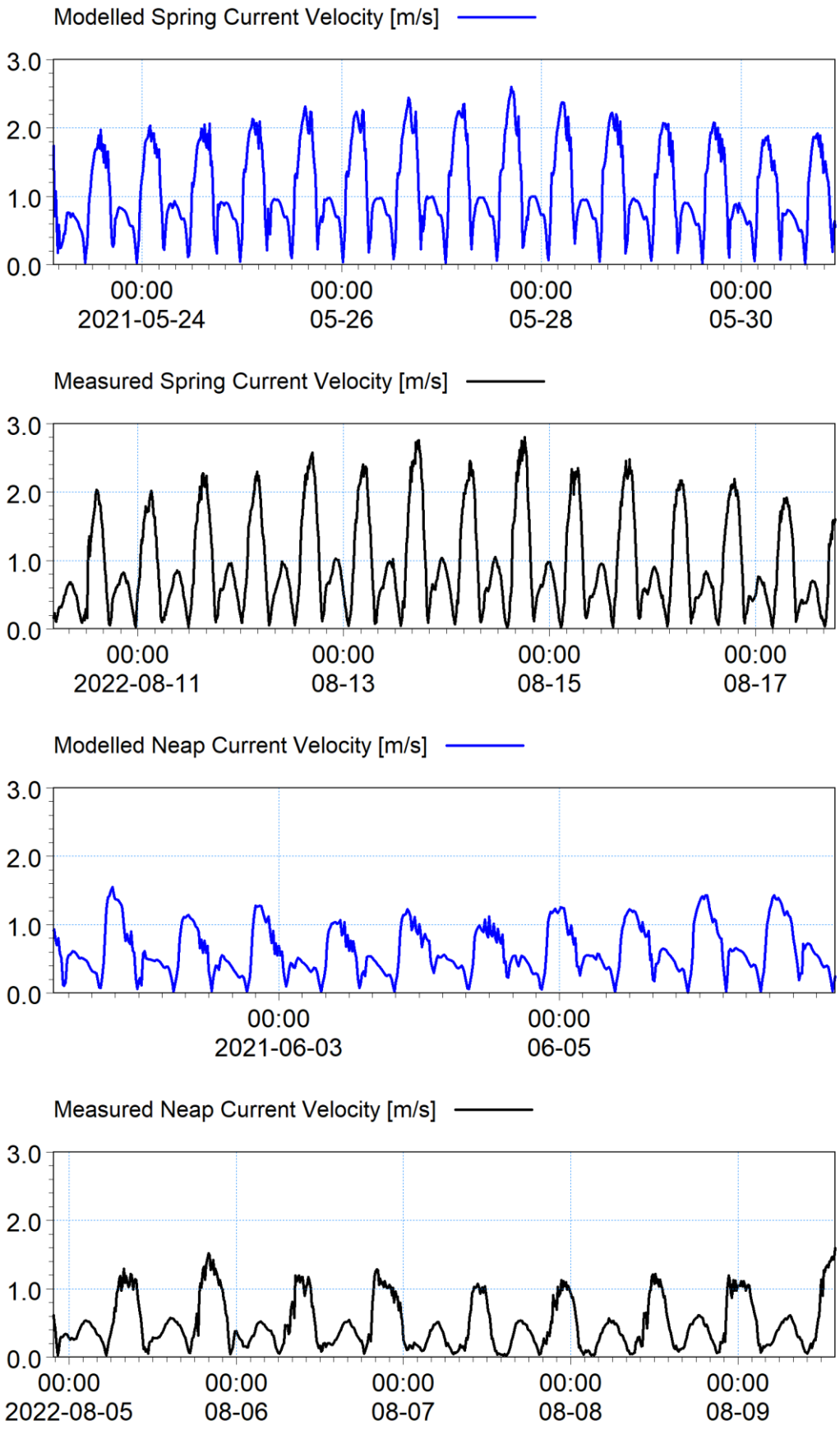

Figure A.6.3: Measured and modelled current velocity for spring and neap tides.

MAKING COMPLEX EASY

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CORRAN NARROWS

Hydraulic Modelling Report Appendix – Additional Report Figures

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Additional Figures

Tides

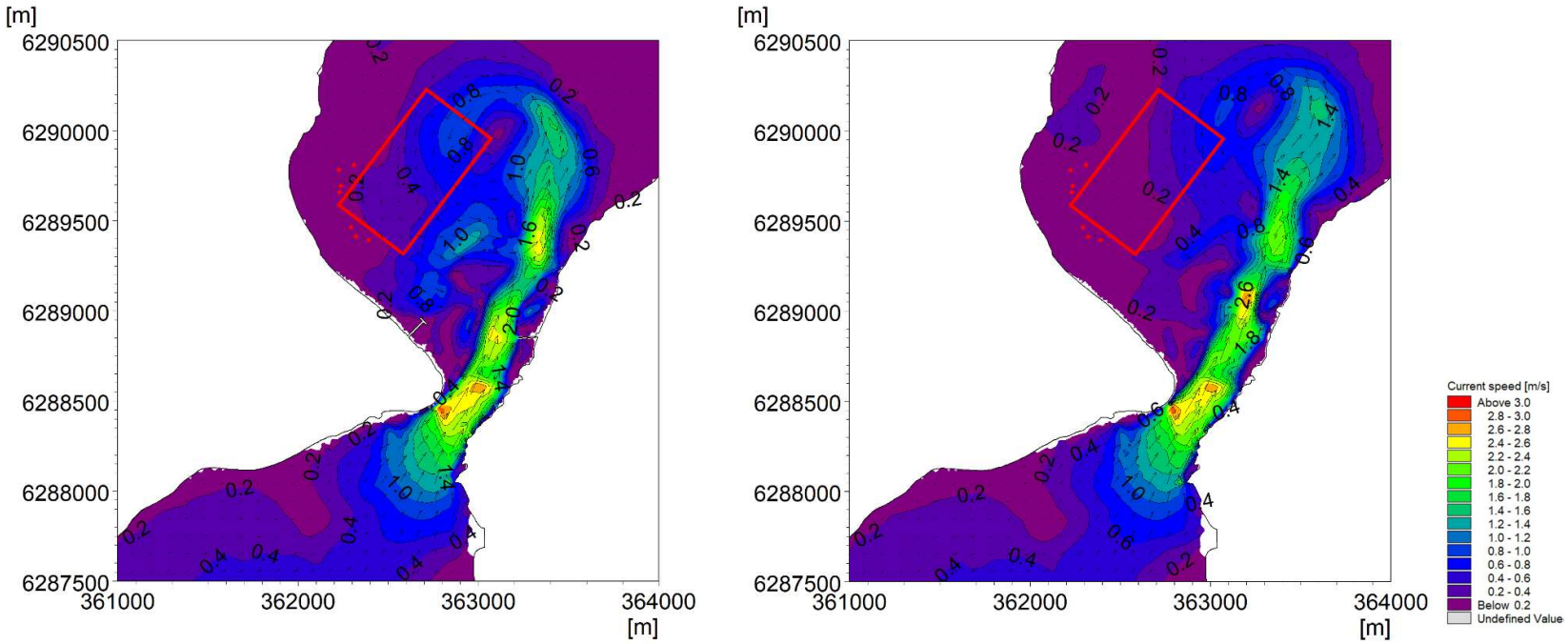

Figure A.1: Current speed during a Mid-Flood Spring Tide – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

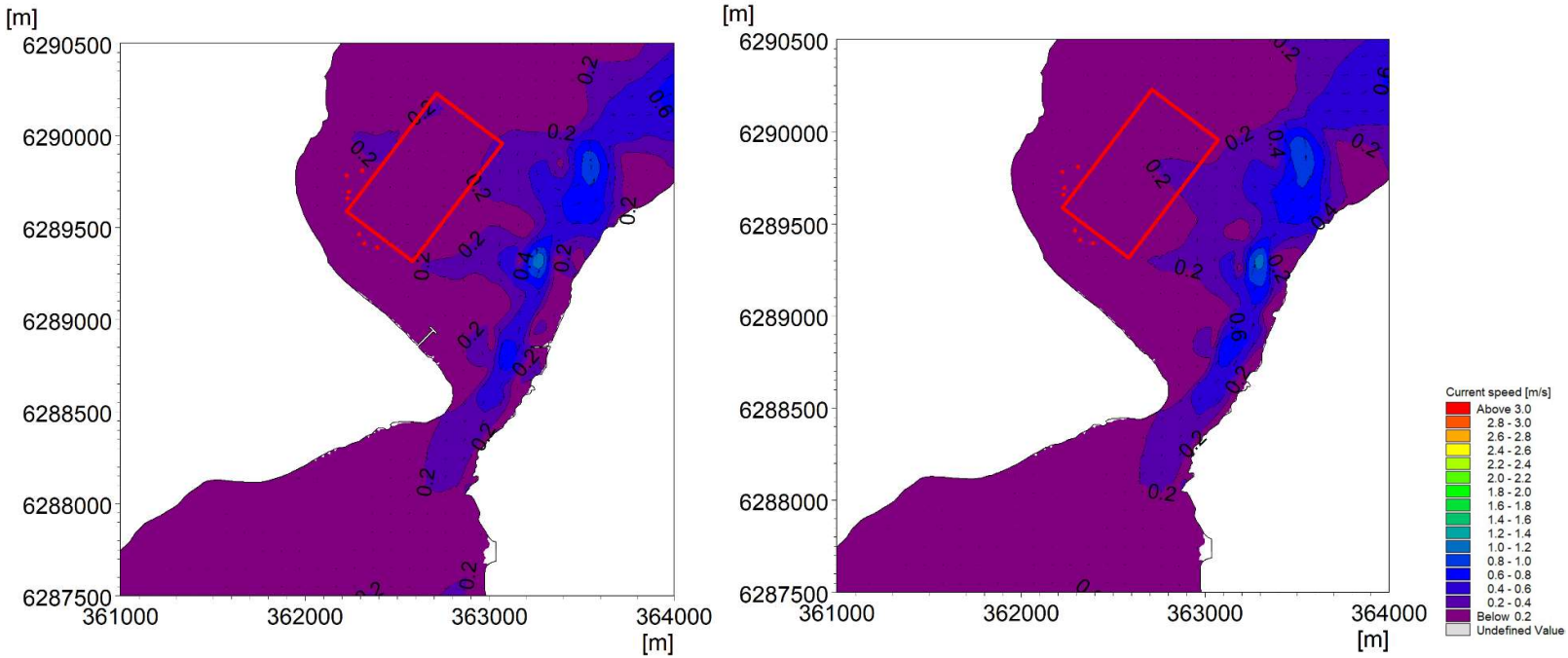

Figure A.2: Current speed during High Water Springs – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

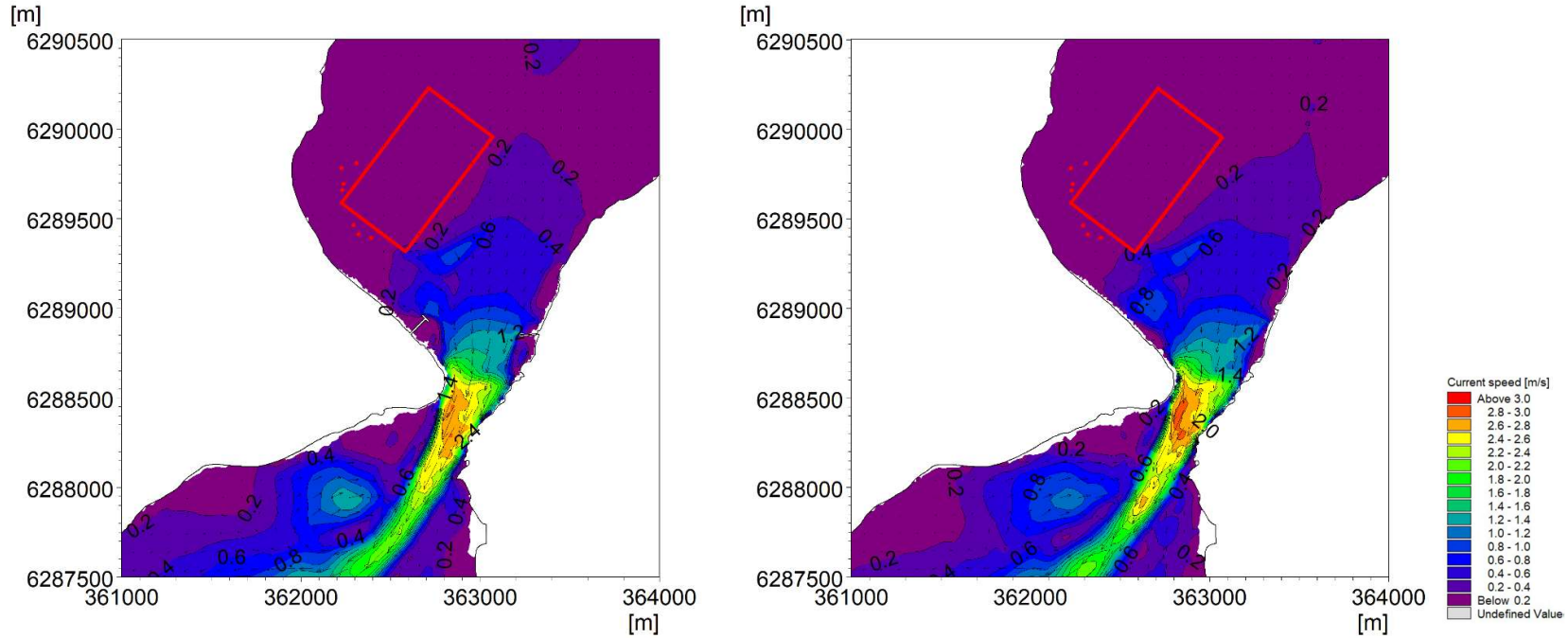

Figure A.3: Current speed during a Mid-Ebb Spring Tide – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

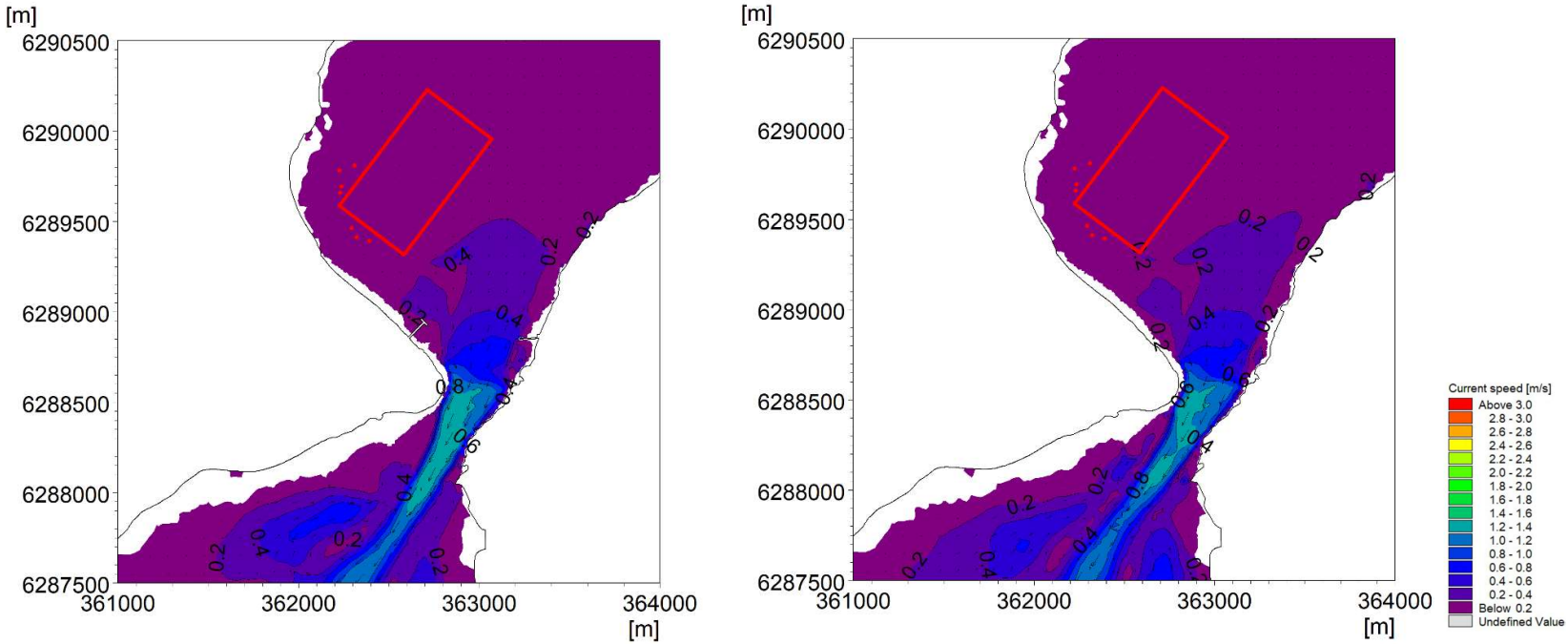

Figure A.4: Current speed during Low Water Springs – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

Waves

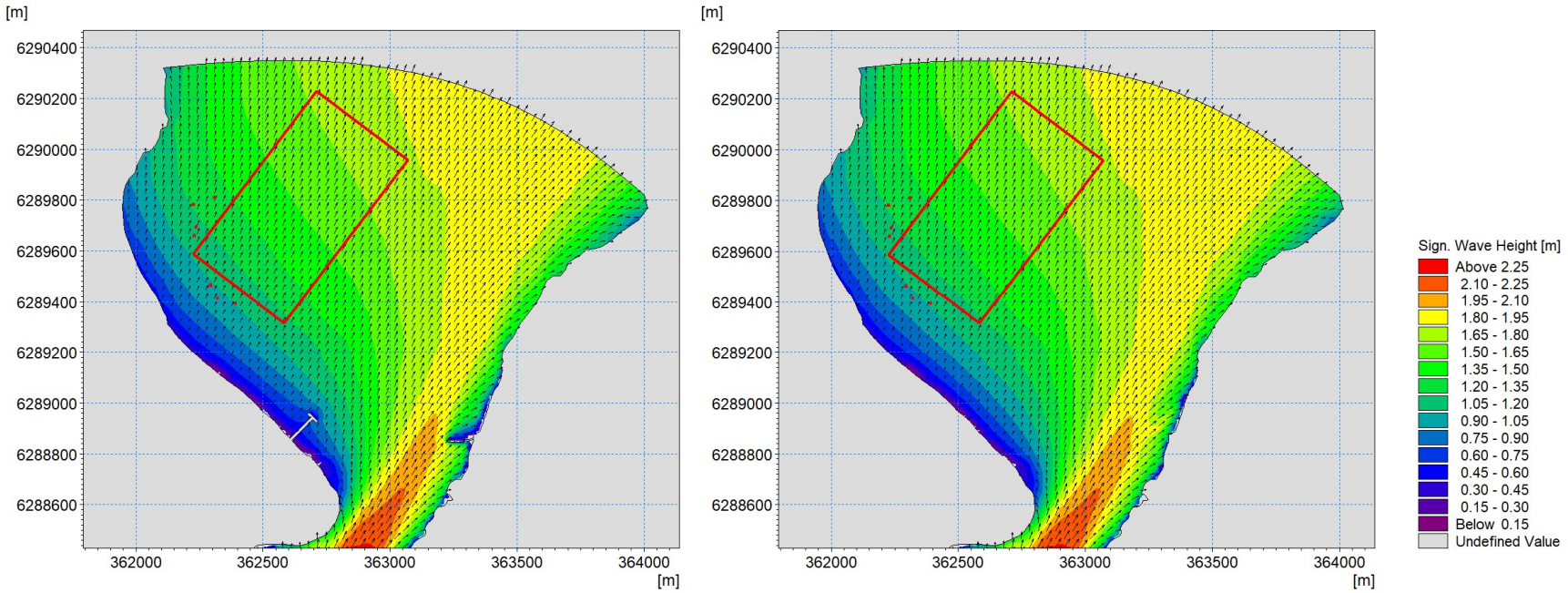

Figure A.5: South Westerly (215°) 1 in 100 Storm Event at Mean High Water Springs with no reflection coefficients on structures – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

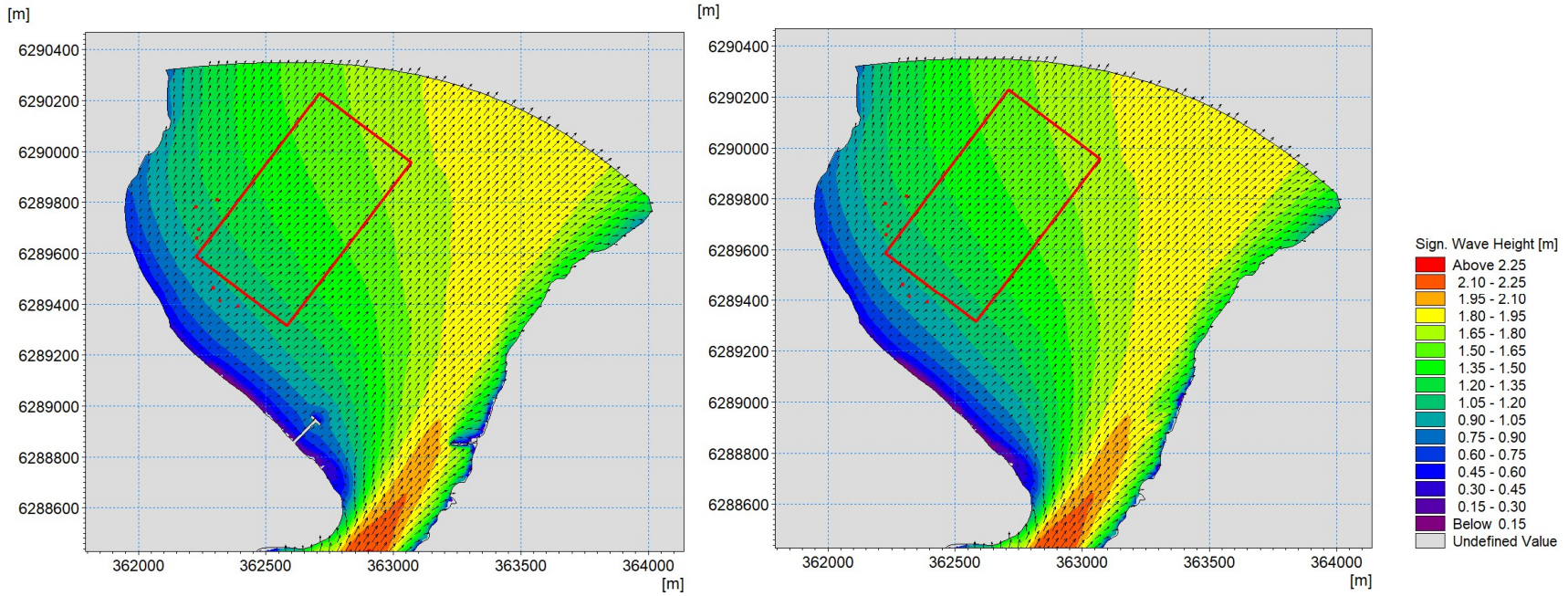

Figure A.6: South Westerly (227°) 1 in 100 Storm Event at Mean High Water Springs with reflection coefficients on structures – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

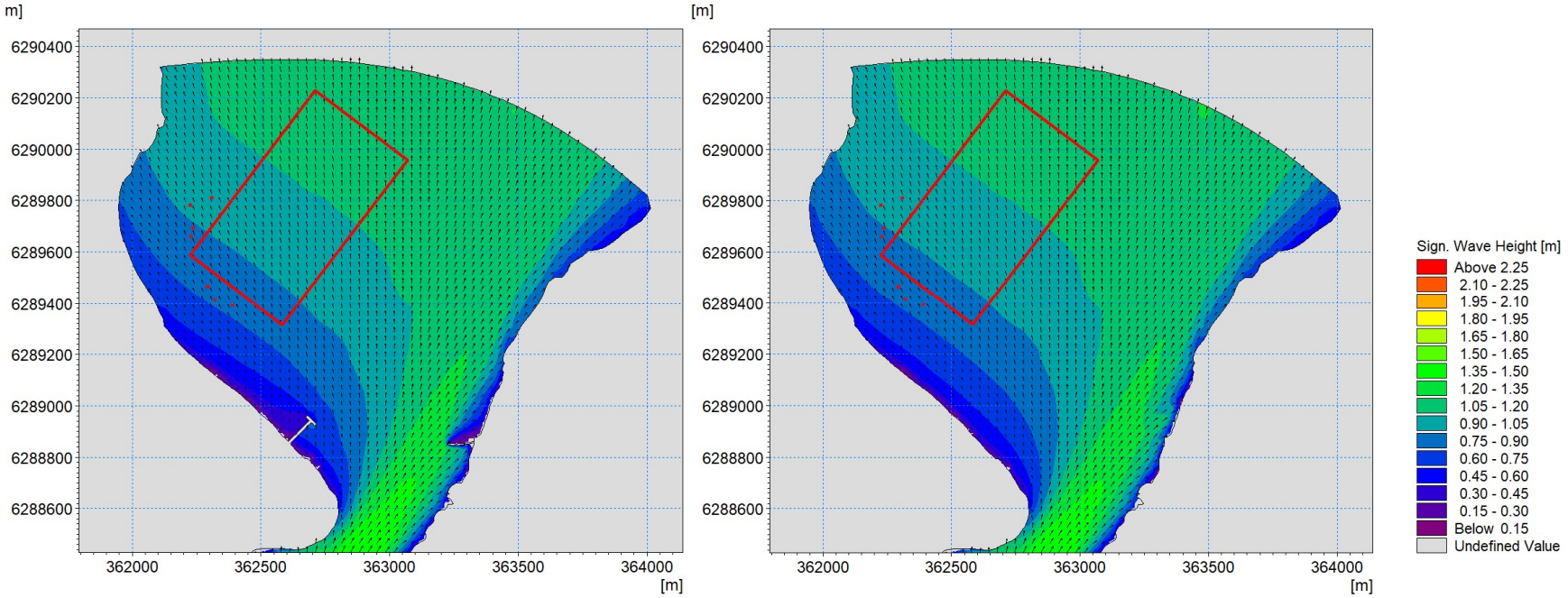

Figure A.7: Southerly (180°) 1 in 100 Storm Event at Mean High Water Springs with reflection coefficients on structures – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

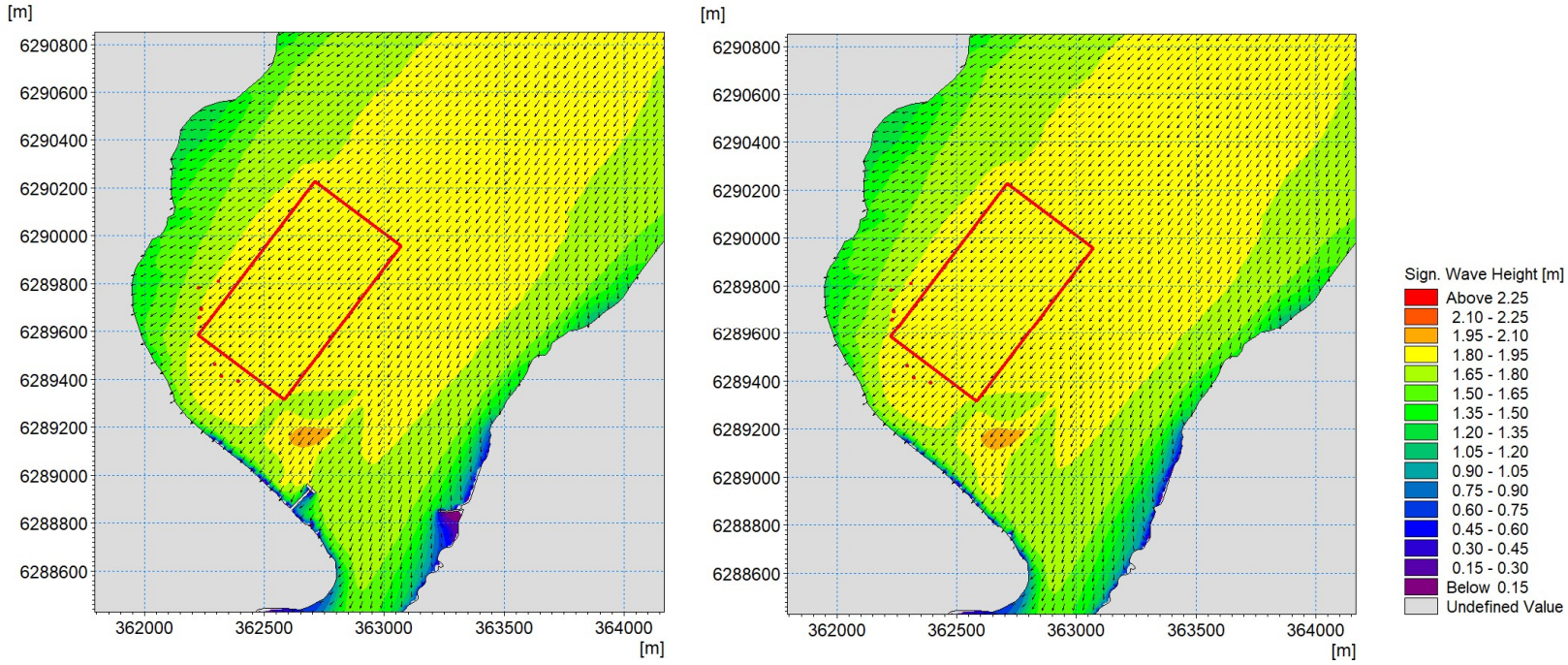

Figure A.8: North Easterly (40°) 1 in 100 year Storm Event at Mean High Water Springs with reflection coefficients on structures – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

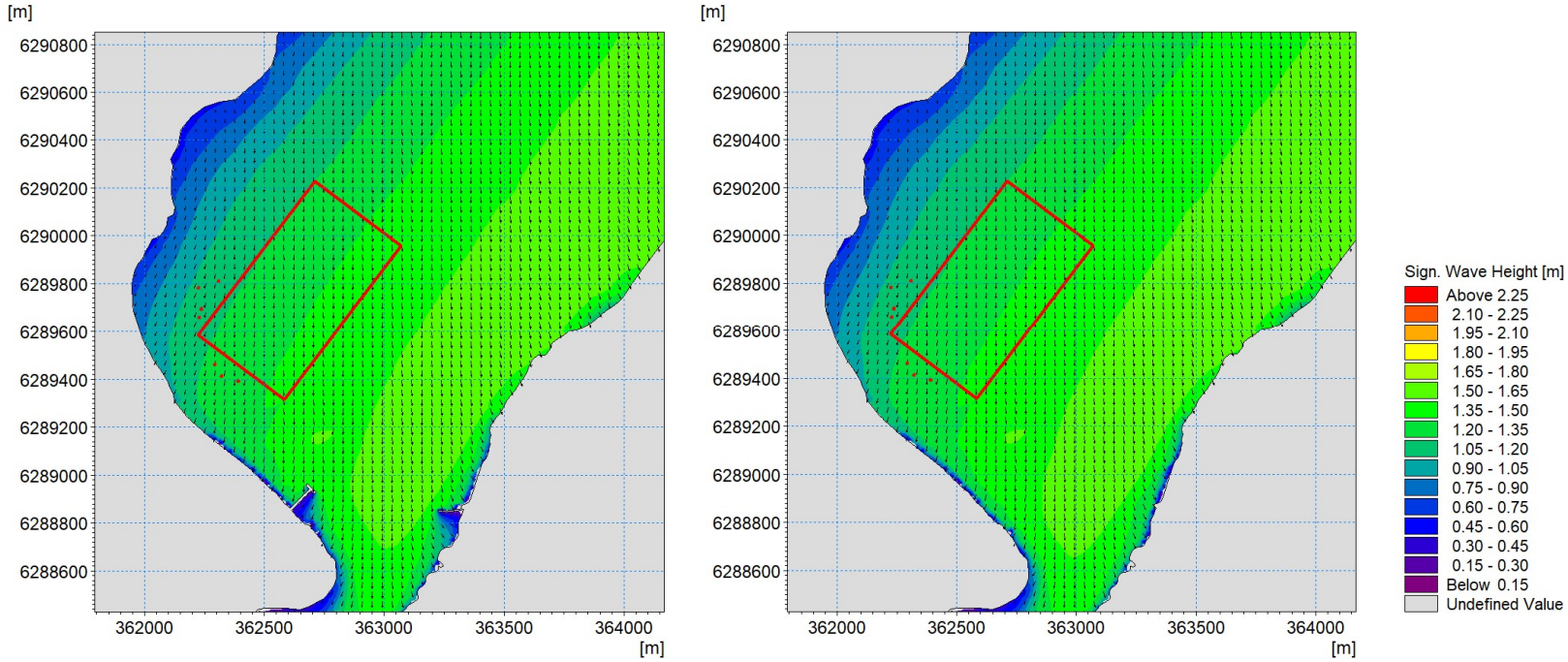

Figure A.9: North Westerly (330°) 1 in 100 year Storm Event at Mean High Water Springs with no reflection coefficients on structures – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

Littoral Currents and Bed Shear Stresses

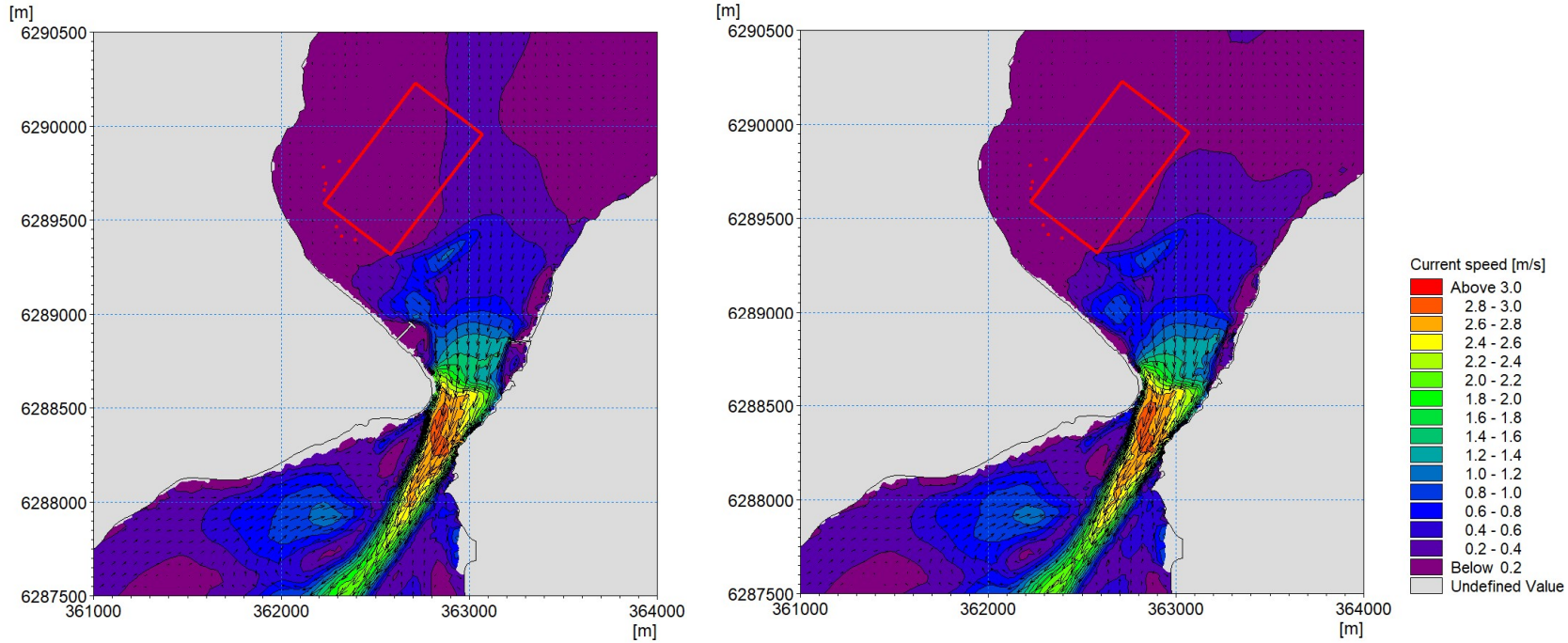

Figure A.10: South Westerly 1 in 1 Year Storm Littoral Currents during ebb tide – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

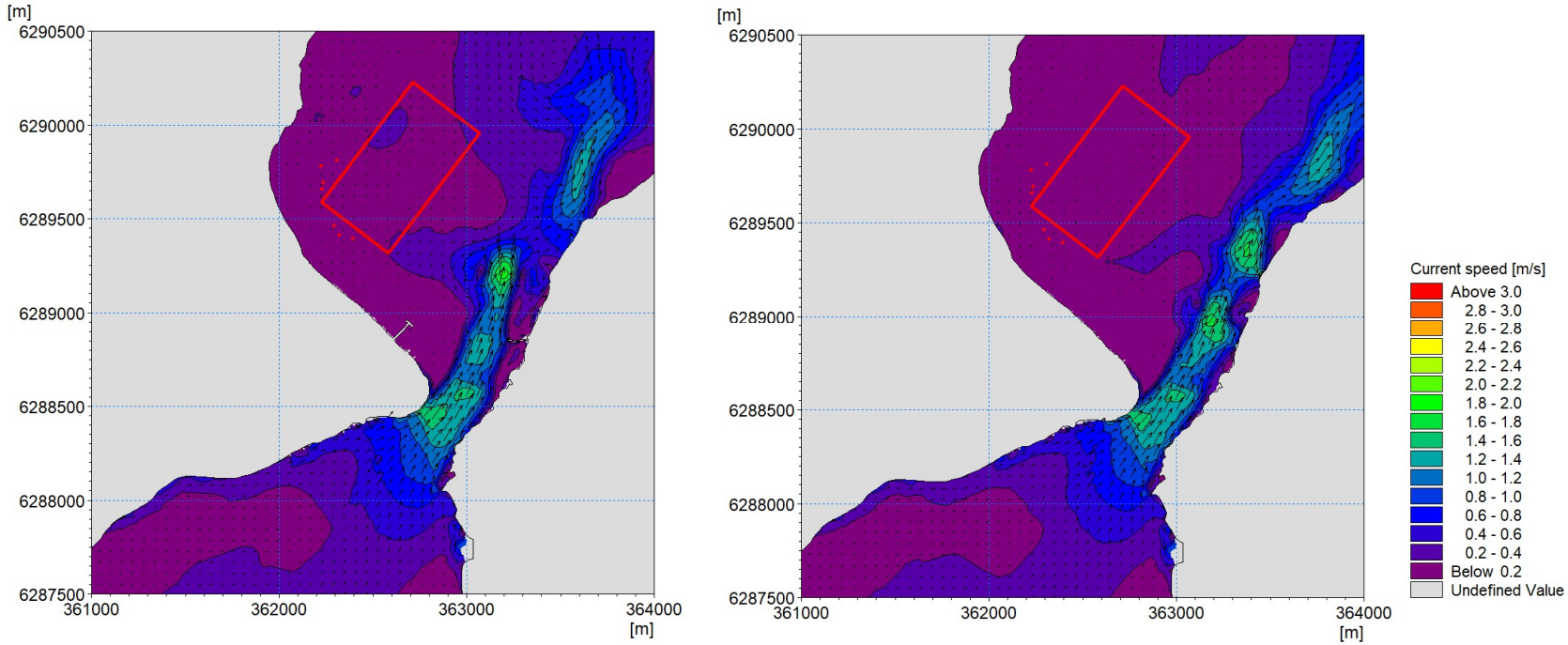

Figure A.11: South Westerly 1 in 1 Year Storm Littoral Currents near High Water – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

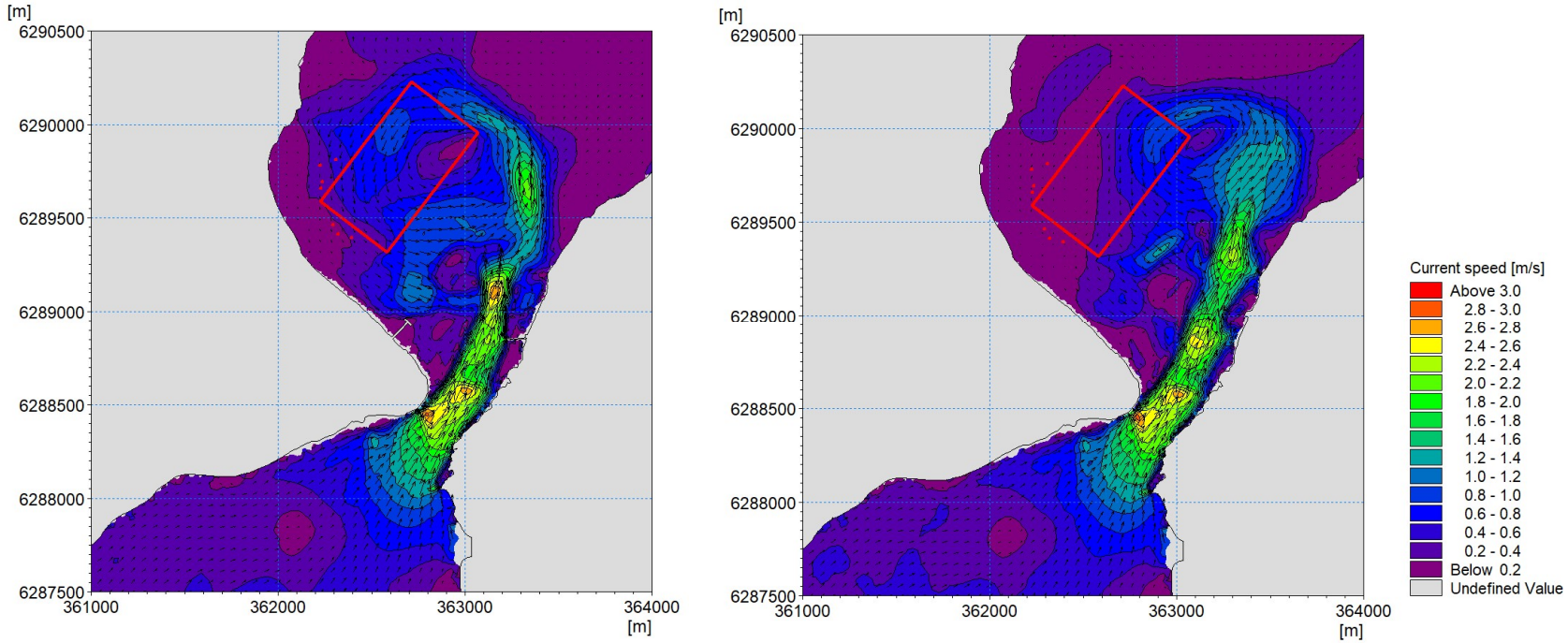

Figure A.12: South Westerly 1 in 1 Year Storm Littoral Currents during flood tide – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

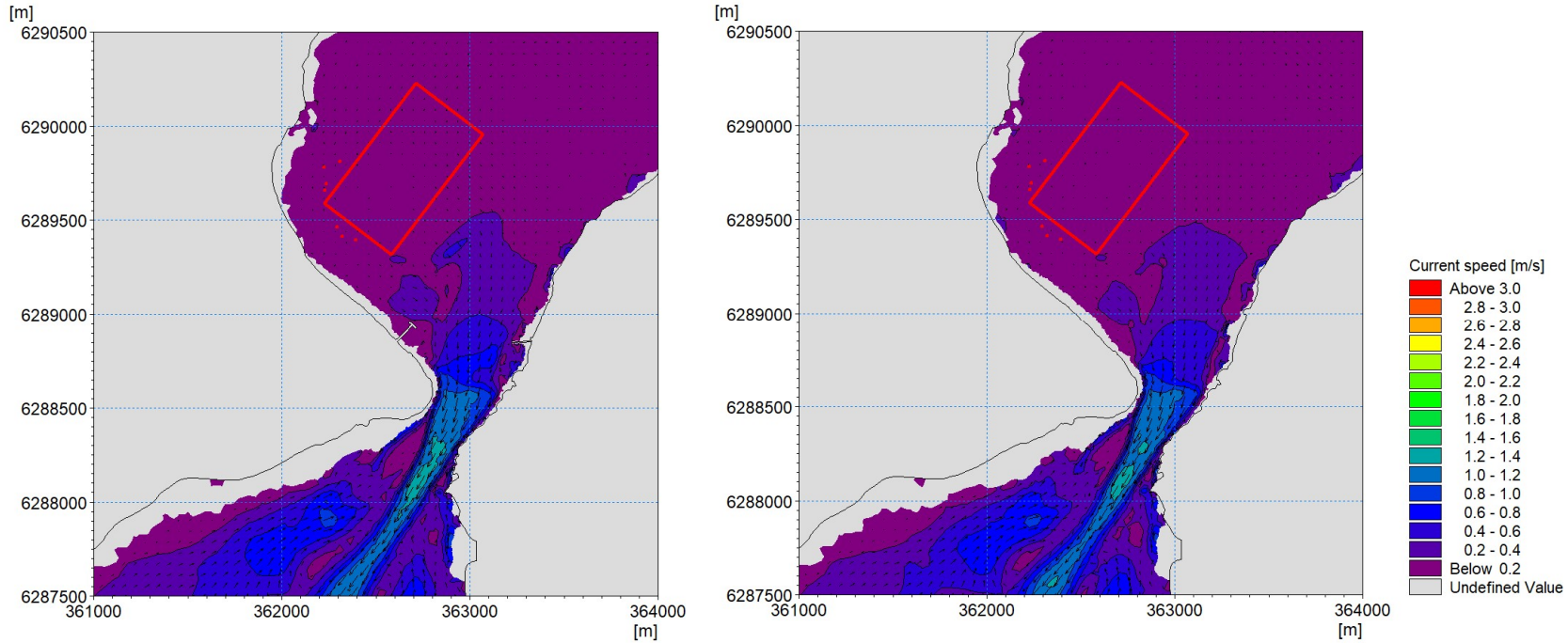

Figure A.13: South Westerly 1 in 1 Year Storm Littoral Currents near Low Tide – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

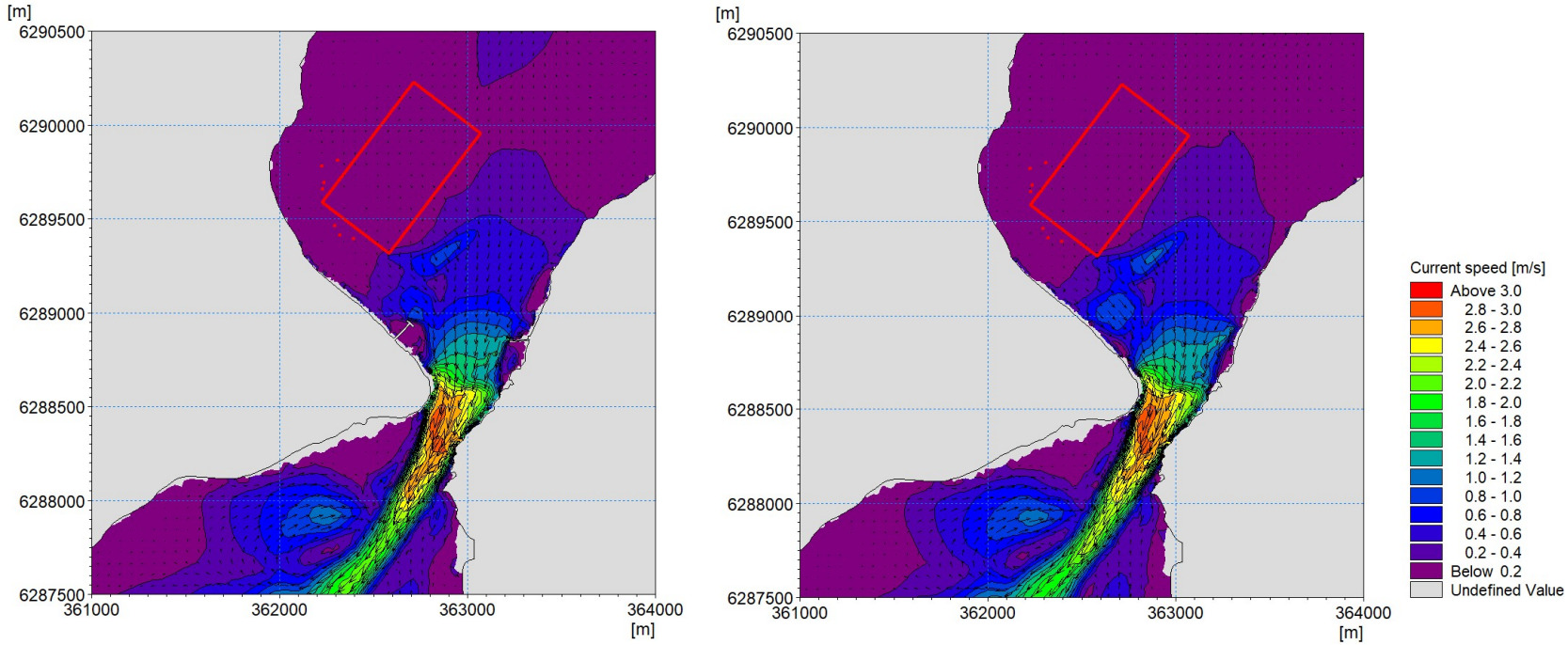

Figure A.14: North Westerly 1 in 1 Year Storm Littoral Currents during ebb tide – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

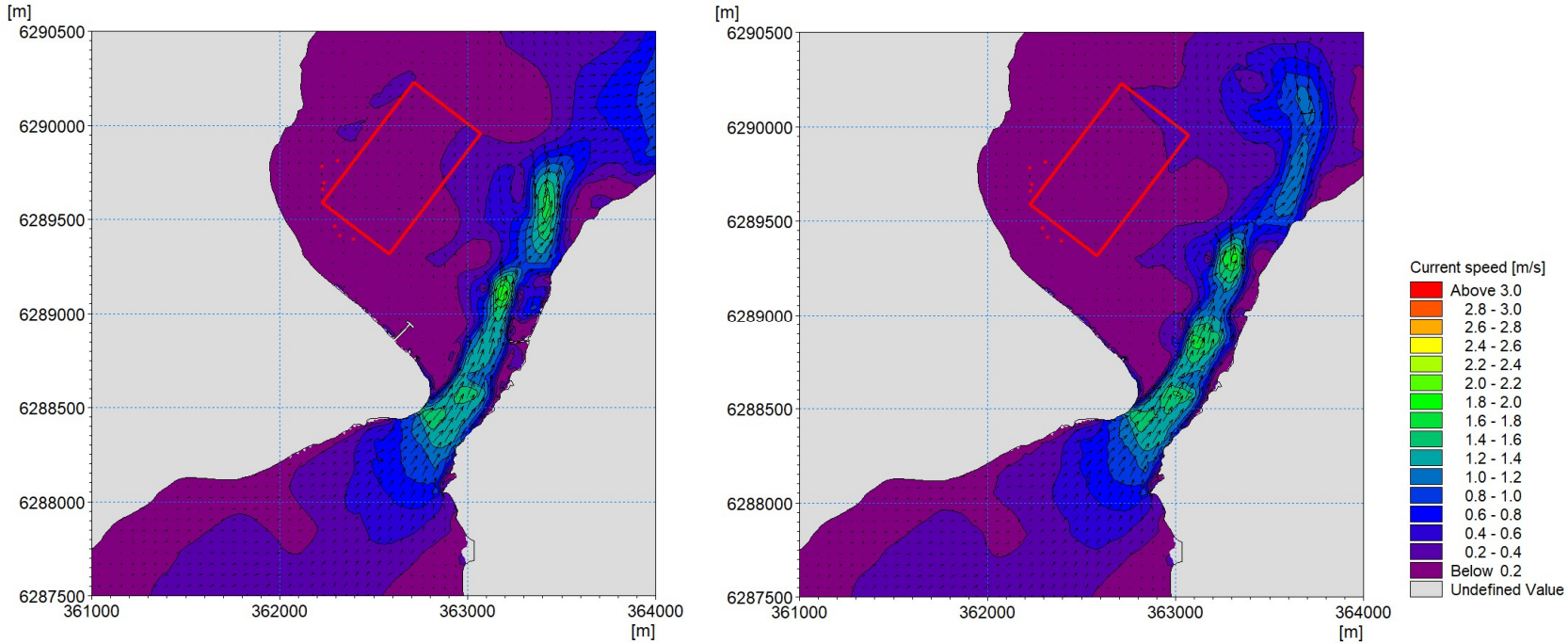

Figure A.15: North Westerly 1 in 1 Year Storm Littoral Currents near High Water – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

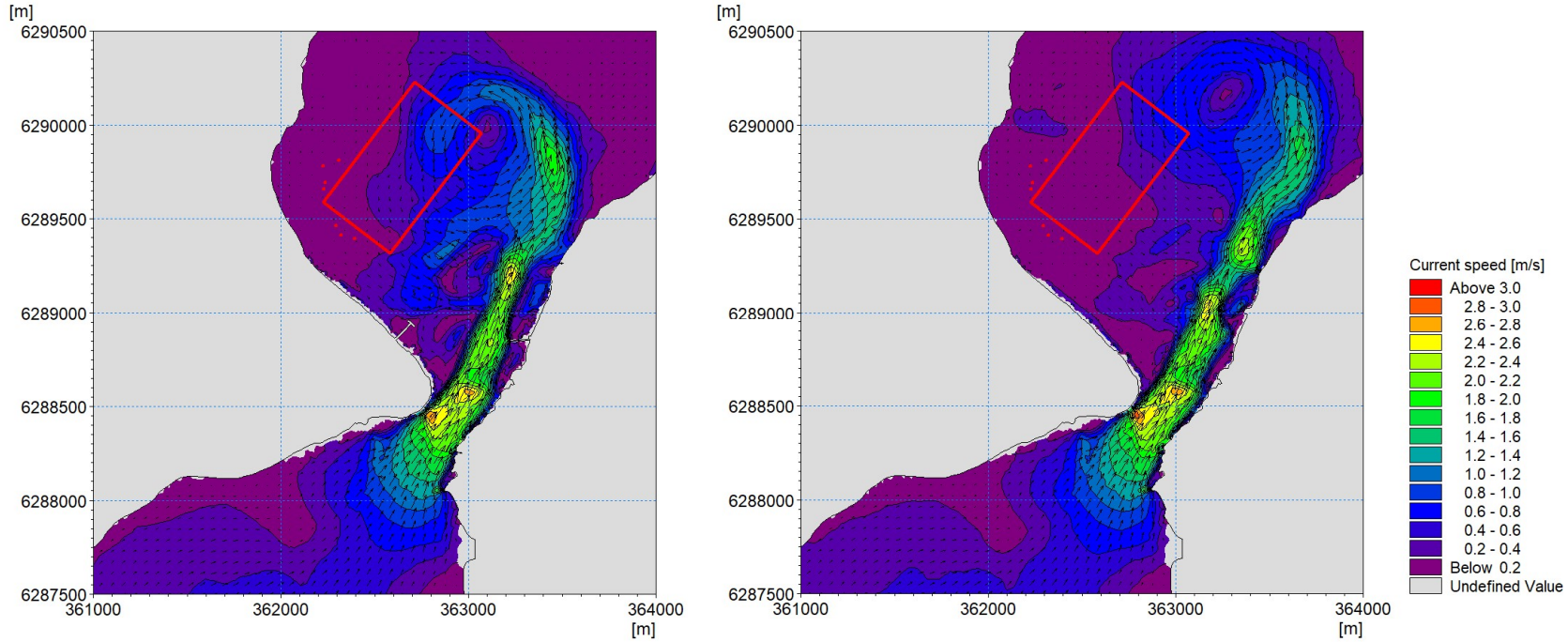

Figure A.16: North Westerly 1 in 1 Year Storm Littoral Currents during flood tide – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

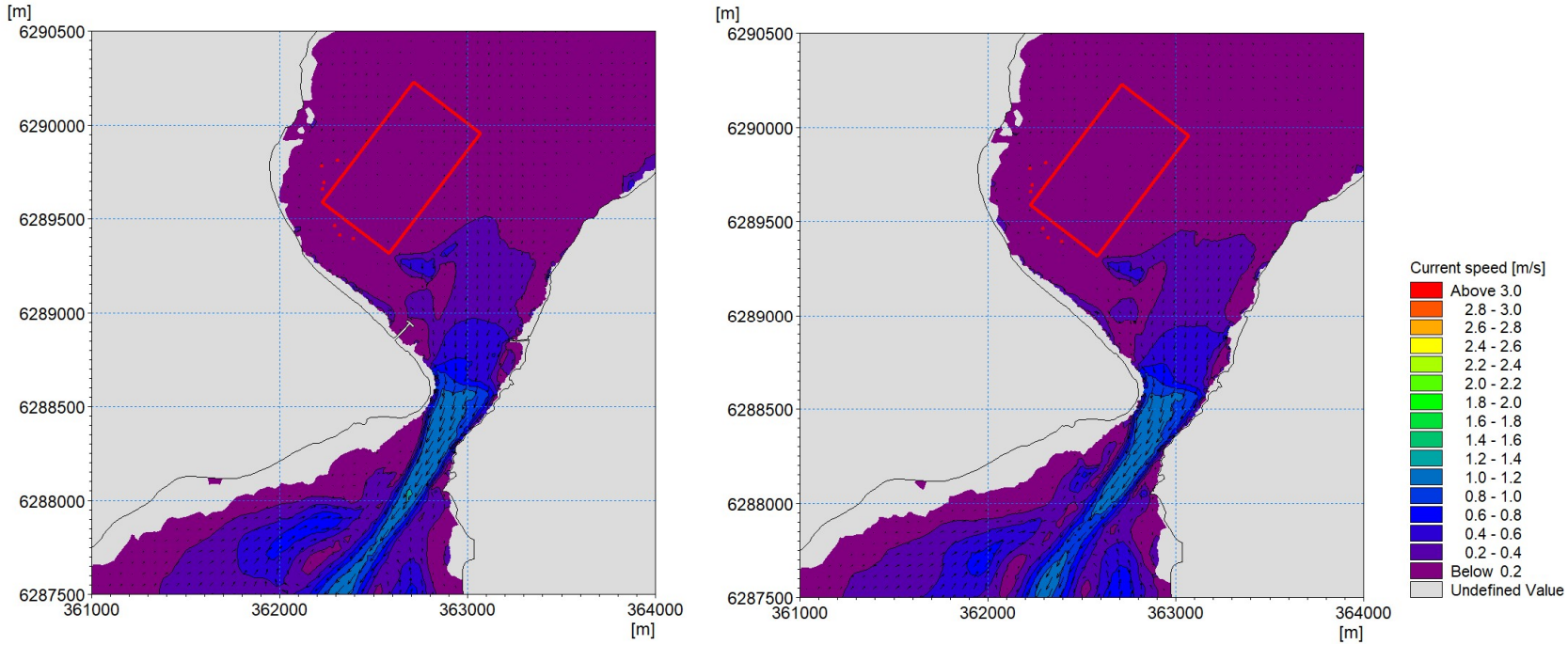

Figure A.17: North Westerly 1 in 1 Year Storm Littoral Currents near Low Tide – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

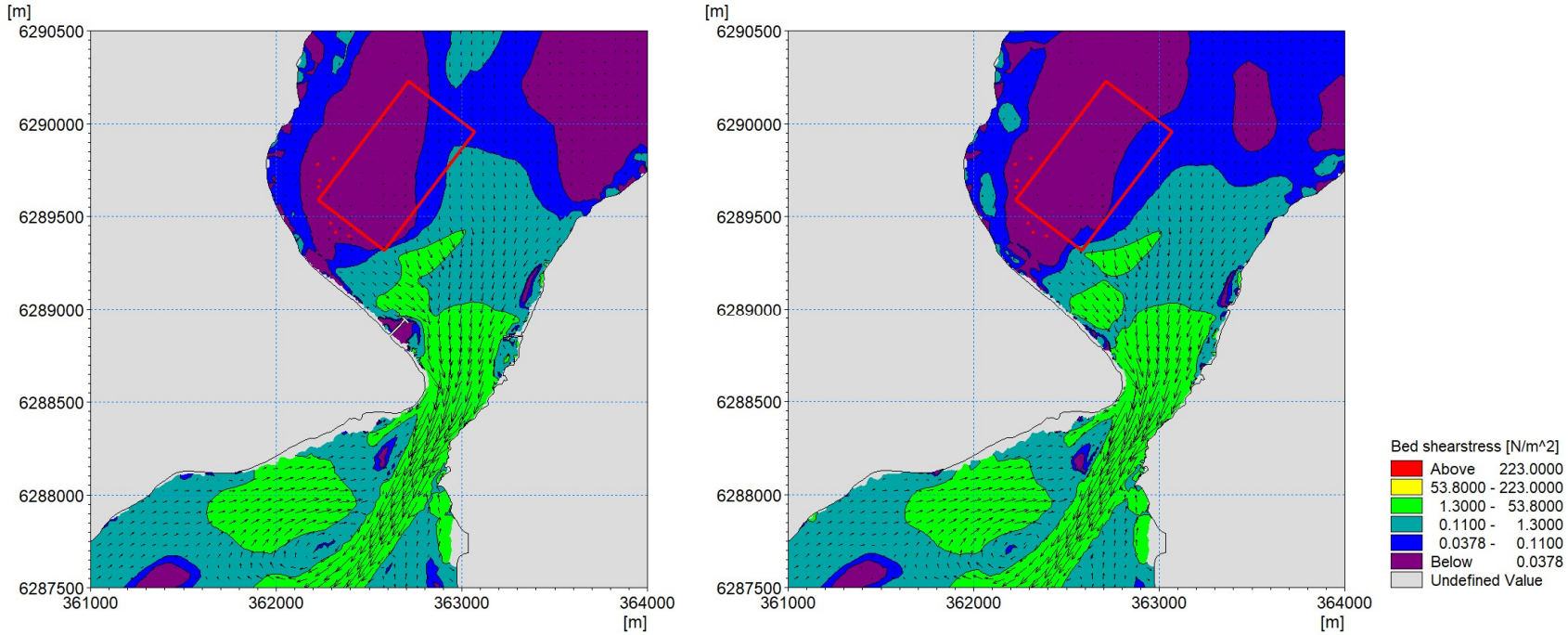

Figure A.18: South Westerly 1 in 1 Year Storm Shear Stress during Ebb Tide – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

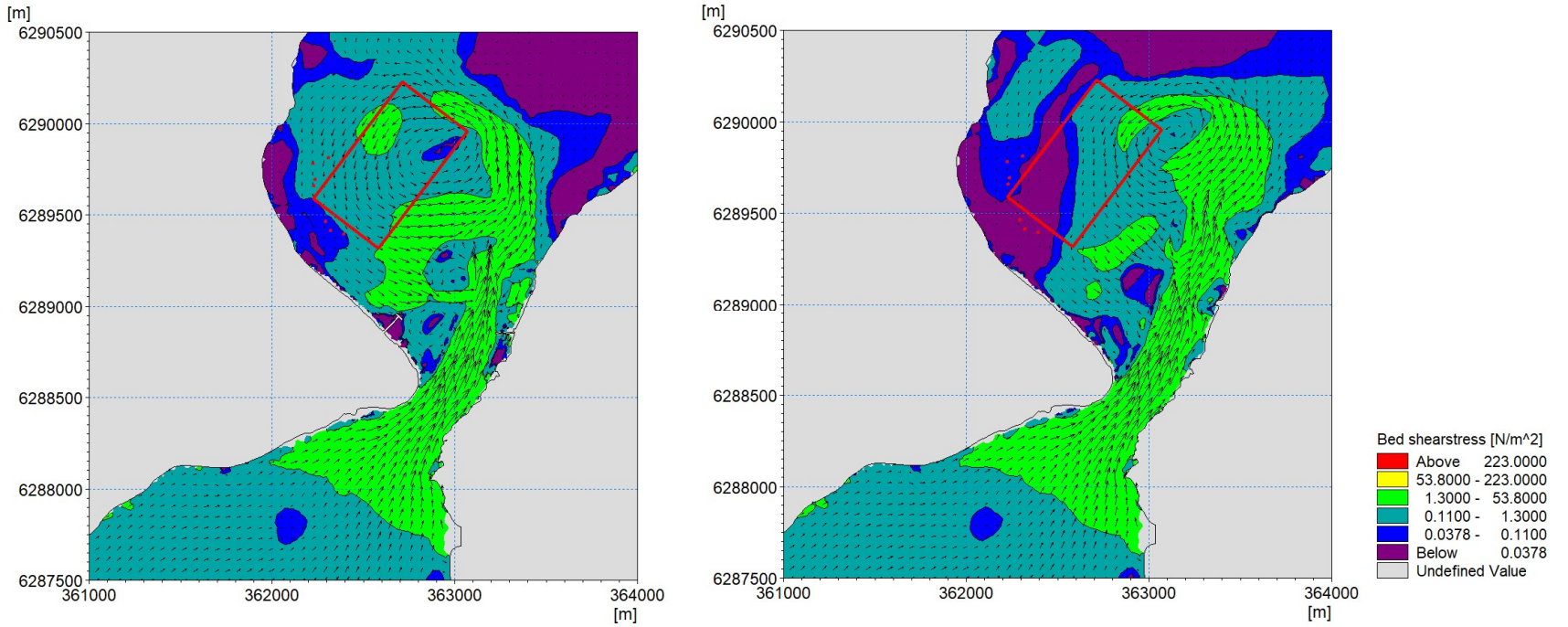

Figure A.19: South Westerly 1 in 1 Year Storm Shear Stress during Flood Tide – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

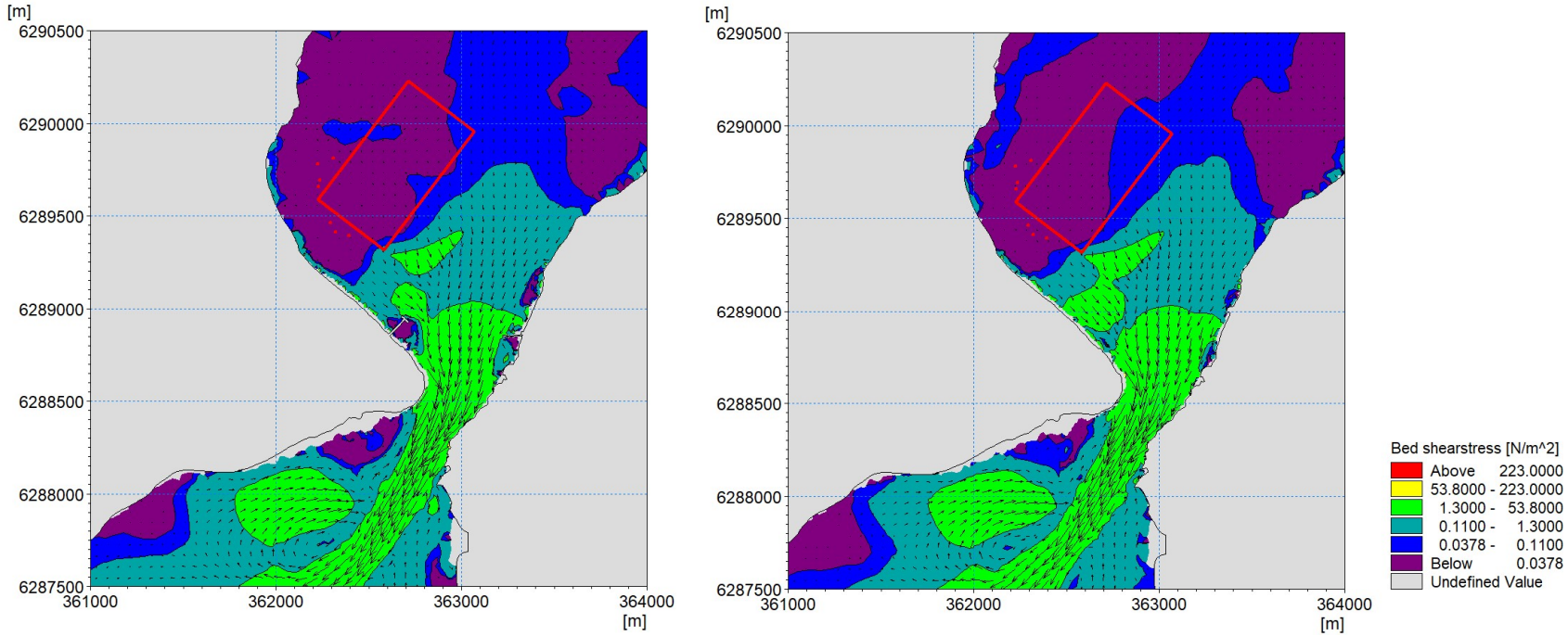

Figure A.20: North Westerly 1 in 1 Year Storm Shear Stress during Ebb Tide – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

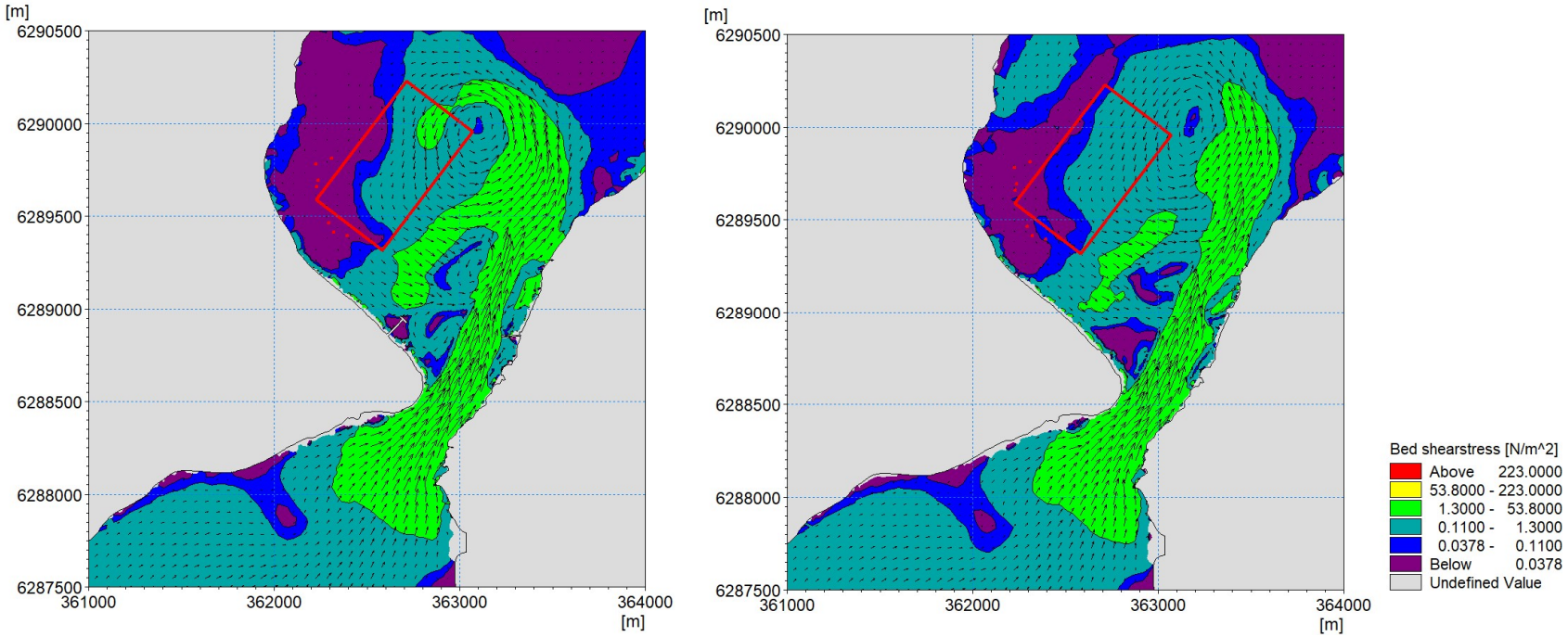

Figure A.21: North Westerly 1 in 1 Year Storm Shear Stress during Flood Tide – Post-Project (Left) and Pre-Project (Right). Red boundary indicates the fish farm licensed area.

Corran Ferry Infrastructure Improvement Scheme

Habitats Regulations Appraisal Supporting Document

Report No. 99_REP_22

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Wallace Stone
Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

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1 Introduction

The Highland Council (THC) has proposed to construct new ferry service infrastructure at the Corran Narrows under the Corran Ferry Infrastructure Improvement Scheme (hereafter referred to as 'CFIIS' or 'the scheme'), approximately seven miles south-west of Fort William. The scheme will involve the construction of new infrastructure in the village of Ardgour, and just north of the Corran settlement in the region of Nether Lochaber, to facilitate the introduction of a new electric vessel for the ferry service and improve facilities for users and operators of the Corran Ferry.

Under the Conservation (Natural Habitats, &c.) Regulations 1994 (commonly known as the 'Habitats Regulations'), all competent authorities must consider whether a development could affect a European site, before it can be authorised or carried out. As such, a Habitats Regulations Appraisal (HRA) is required when a project has the potential to cause adverse effects to any European Site, including Special Protection Areas (SPAs) and Special Areas of Conservation (SACs). The CFIIS development site is comprised of four land parcels, with two situated on the Ardgour side and two situated on the Nether Lochaber side. Birds, marine mammals, fish and shellfish have been identified as potential ecological receptors of the development (Affric Limited, 2025). As these species can be associated with the qualifying interests of SPAs and SACs, the potential for the CFIIS to impact upon the conservation objectives of any European Sites within the wider locality is being considered. The aim of this HRA Supporting Document is to provide the necessary information required for the competent authority to carry out a HRA, to determine whether the development will impact upon any European Sites.

The document provides reference to in-depth ecological surveys that have been completed within the area of the CFIIS, in support of the planning permission application and marine licence application. The efforts and results of these studies show extensive knowledge of the ecological nature of the CFIIS development site, in support of the justifications throughout this document.

2 Objectives

The objectives of this HRA Supporting Document are to:

- Outline the details of the CFIIS;
- Consider whether there is any potential ecological connectivity between the proposed development works and any qualifying interests associated with European Sites;
- Identify whether there are any Likely Significant Effects (LSEs) to any qualifying interests due to proposed development works;
- Determine whether there will be any adverse effects to the conservation objectives of any of the European Sites identified, due to potential impacts to qualifying interests; and
- To ensure THC and Marine Directorate are provided with suitable information to carry out an HRA, including an Appropriate Assessment (AA) (noting that information is provided within the Environmental Impact Assessment Report (EIAR)).

3 Legislative Context

3.1 Legislation

Articles 6(3) and 6(4) of the Habitats Directive (92/43/EEC) are implemented in Scotland through the Habitats Regulations. As a result of the United Kingdom (UK) leaving the European Union (EU), the Habitats Regulations were amended in Scotland, in 2019. The Habitats Regulations remain in force, including the provisions for the protection of European Sites.

The above legislation determines that, if a plan or project could affect a European Site there are certain considerations that must be made before the proposal can proceed. In particular, Regulation 48 of the Habitats Regulations dictates that any plan or project, which may result in an LSE on any qualifying interests associated with a European Site (either alone or in combination with other plans or projects) and is not directly connected with or necessary to the management of the site, shall be subject to an AA. The AA must demonstrate that the proposal will not adversely affect the integrity of the site.

It is the responsibility of the competent authority to carry out the HRA (and AA if deemed necessary) based on robust, scientific information provided by the project developer. It is not the role of the developer to make an assessment on whether the proposal will have an adverse effect on any qualifying interests associated with European Sites. An AA will only be required if there is considered to be an LSE to any qualifying interests, to allow for an assessment of the potential for adverse effects to European Sites.

4 Terminology

4.1 European Site

In Scotland, European Sites include SPAs and SACs, 'candidate' SACs (cSACs) and proposed SPAs (pSPAs) and SACs (pSACs) which have been approved by Scottish Ministers for formal consultation. The parts of SPAs, SACs, cSACs, pSPAs and pSACs which lie below Mean High Water Springs (MHWS) tidal height are also referred to as 'European Marine Sites,' and those in the offshore marine area are also called 'European Offshore Marine Sites' (EOMS).

4.2 Ramsar Site

A Ramsar site is a site listed as a wetland of international importance under the provisions of the 'Ramsar Convention.' In Scotland, all Ramsar sites are also European Sites and/or Sites of Special Scientific Interest (SSSI). Thus, are protected under the relevant statutory regimes. Where Ramsar interests coincide with European Sites, the qualifying interests are protected under an SPA or SAC. Therefore, the qualifying interest is directly associated with that of a European Site and is given the same level of legal protection and does not need to be considered independently within the HRA process. Where the qualifying interests of a Ramsar site are not the same as European Site, but instead match SSSI qualifying interests, they receive protection under the SSSI regime. Hence, Ramsar sites are not pertinent to the requirements for an HRA.

4.3 Likely Significant Effect

The terminology employed as part of the HRA process is specific, and in some instances the words have a meaning distinct to that in common usage. In particular, there is a distinction between the usage of 'LSE' and 'adverse effects' on-site integrity.

In this HRA Screening Supporting Document, the use of 'LSE' refers to the potential for adverse effects on the integrity of a European site in the absence of mitigation.

A project component is identified to result in an LSE if there is potential ecological connectivity between a qualifying interest associated with a European Site and the proposed works area, and the proposed works are anticipated to have an impact upon the conservation objectives of the European Site in the absence of mitigation. As such, the conservation objectives of the site provide the framework for considering the potential for LSEs. The European Court of Justice (2004) states that where an LSE:

> *'cannot be excluded, on the basis of objective information'*

or without the use of mitigation, an AA is required.

5 Proposed Development

As part of the coastal nature of the scheme, development will occur in the marine and terrestrial environment, including intertidal areas. Development will be undertaken within the Marine Licence Boundary and Planning Boundary as shown in Drawing 99_DRG_C2_1: Planning and Marine Licence Boundaries (as per Section 2.1.1, Chapter 2: Project Description of the EIAR).

The CFIIS comprises the following main components:

New infrastructure on the Ardgour side:

- Slipway;
- Slipway access, including a low retaining wall;
- Localised road improvements and formalised residential parking;
- Footpath;
- Bicycle shelter and pedestrian shelter;
- An overnight berthing structure with crew access, fendering and vessel charging facilities;
- Associated services (lighting, power, vessel charging, water and drainage); and
- Temporary diesel generator with associated fuel storage in a bunded tank (if required).

New infrastructure on the Nether Lochaber side:

- Slipway;
- A breakwater with fendered vessel alignment structure;
- A new marshalling area;
- A new junction with the A82 and access road to the marshalling area;
- Public car parking;
- EV car charging units;
- Purser's kiosk;
- A toilet block; including shelter areas and a changing places facility;

- A bicycle shelter;
- Shared-use path(s);
- Access steps providing a short-cut route from the new slipway to the shared-use path along the A82; and
- Associated services (lighting, power, water and drainage).

Construction of the infrastructure will be facilitated by removal of de-energised sub-sea cabling, demolition of the small, existing pier at Ardgour, land reclamation, dredging activities and the establishment of temporary construction compounds.

Once operational, the main activities associated with the ferry service will not change due to the CFIIS. Activities will be very similar to what they are currently and concentrated around the Corran Narrows.

6 Scope for Qualifying Interests

The CFIIS will involve works in both the terrestrial and marine environment, as such qualifying interests associated with a number of habitats will be considered. Qualifying interests associated with European Sites that are known to be present within the north of Scotland are outlined in the sections below, alongside the scope for associated European Sites to be included (i.e. based on the ecology of the qualifying interests and distance between the European Site and the proposed works). It should be noted that some qualifying interests may be included within the assessment for a European Site which has been scoped in for different reasons.

6.1 Habitats

European sites were considered if there were qualifying interests associated with marine, intertidal or freshwater habitats and there was a direct link between the habitat and Loch Linnhe (NatureScot, 2023b), or where a terrestrial habitat had direct linkage to the CFIIS site. No European sites were identified to have a link between the protected habitat and Loch Linnhe, due to immobile features being located a considerable distance away.

6.2 Atlantic Salmon

Atlantic salmon (*Salmo salar*) are habitual, returning to the same river each year (Mills, 1985). Therefore, it has been assumed that any Atlantic salmon within Loch Linnhe will be associated with rivers that flow directly into the loch or connected waterbodies along the Great Glen. Only one European Site listing Atlantic salmon as a qualifying interest was identified within the scope, the River Moriston SAC. As such, this is the only European Site taken forward for the presence of Atlantic salmon.

6.3 Sea Lamprey and River Lamprey

Sea lamprey (*Petromyzon marinus*) and river lamprey (*Lampetra fluviatilis*) do not always return to their spawning ground, and instead, utilise sensory organs to identify suitable spawning habitat (NatureScot, 2023c). Therefore, the scope for sea lamprey included any European Sites listing the species as a qualifying interest within water systems with direct connectivity to Loch Linnhe, or adjacent water systems within the Great Glen. No European sites were identified within the scope for sea lamprey and river lamprey, therefore, both species will not be considered within the screening assessment for potential ecological connectivity.

6.4 Freshwater Pearl Mussel

Any disturbance or sedimentation associated with the proposed CFIIS is expected to be highly localised within the marine environment and no disturbance to freshwater habitats is anticipated. Nonetheless, the larval phase of freshwater pearl mussel (*Margaritifera margaritifera*), and therefore successful recruitment, is reliant on the integrity of salmonids (Taeubert and Geist, 2017) of which includes the salmon population. As such, impacts on this phase of the pearl mussel life cycle are directly correlated to impacts on Atlantic salmon. The River Moriston is the only European Site being taken forward for the presence of Atlantic salmon (see Section 6.2: Atlantic salmon). As the River Moriston also lists freshwater pearl mussel as a qualifying interest, the European Site will also be taken forward for the presence of freshwater pearl mussel.

6.5 Otter

In a coastal environment, otter (*Lutra lutra*) generally range between 2–10 kilometres (km) to forage (Chanin, 2003), whilst in a freshwater environment, female otter are known to range up to 20km and male otter are known to range up to 32km (NatureScot, 2020d). Therefore, the scope included any European Sites within 32km designated in full, or in part, due to the presence of otter, and any European Sites connected to sites scoped in due to the presence of otter. There are seven European Sites situated within 32km of the CFIIS development site, including:

- Loch Etive Woods SAC;
- Sunart SAC;
- Glen Beasdale SAC;
- Morvern Woods SAC;
- Rannoch Moor SAC;
- Glen Creran Woods SAC; and
- River Tay SAC.

Therefore, otter will be taken forward for further assessment.

6.6 Grey Seal

Grey seal (*Halichoerus grypus*) undertake both short-distance and long-distance travel. A study tracking grey seal identified that individuals return to the same haul-out site during 88% of trips, travelling a mean return distance of 39.8km (McConnell *et al*., 2001). Long-distance travel by grey seal has been recorded up to 2,100km, however, long-distance trips were generally undertaken to known haul-out sites (McConnell *et al*., 2001). When considering the distances that seal would need to travel through the marine environment, the closest known designated haul-out site for grey seal from the CFIIS development site is on Soa Island (Marine Scotland National Marine Plan interactive (NMPi), 2024). It is expected that grey seal associated with Soa Island could contribute towards population of grey seal associated with European Sites up to 2,200km away (McConnell *et al*., 2001). Nonetheless, in order to reach the CFIIS development site from Soa Island, grey seal would need to travel approximately 99km through the marine environment, which would not be expected due to the lack of known haul-out sites within the vicinity. Furthermore, for grey seal to reach the Armadale Disposal Site (the location where dredge material will be disposed of), an individual would need to travel 70.5km through the marine environment, where there are also no known haul-out sites, making this also unlikely (McConnell *et al*., 2001). For grey seal to reach the Armadale Disposal Site it would

need to travel As such, grey seal, as qualifying interest of European Sites will not be taken forward for further assessment.

6.7 Harbour Seal

Harbour seal (*Phoca vitulina*) typically range up to 50km to forage (Lyons, 2004), thus the scope included any European Sites within 50km designated in full, or in part, due to the presence of harbour seal. One European site, the Eileanan Agus Sgeiran Lios Mor SAC, was identified within 50km of the CFIIS which listed harbour seal as a qualifying interest, therefore, the species is considered within the screening assessment for potential ecological connectivity. This designated site is also 95km away from the Armadale Disposal Site.

6.8 Bottlenose Dolphin

In an estuarine environment, bottlenose dolphin (*Tursiops truncatus*) have a range of 12–105km (Balmer *et al.*, 2013; Nekolny *et al.*, 2017). Therefore, the scope included any European Sites within 105km designated in full, or in part, due to the presence of bottlenose dolphin. No European Sites listing bottlenose dolphin as a qualifying interest were identified within 105km of the CFIIS development site or the Armadale Disposal Site, and therefore, bottlenose dolphin will not be considered further.

6.9 Harbour Porpoise

Harbour porpoise (*Phocoena Phocoena*) have been recorded within Loch Linnhe and the CFIIS (Graham *et al.*, 2017; National Biodiversity Network (NBN), 2025). There is a lack of scientific documentation of the movement and range of harbour porpoise populations (Hague *et al.*, 2020), although it is expected that populations of harbour porpoise could have large, cross-continental ranges. Nonetheless, a study researching the effects of fine-scale oceanographic features on the distribution and movements of harbour porpoise in the Bay of Fundy, determined that the population of harbour porpoise had a core range of 300 square kilometres (km^2) (Johnston *et al.*, 2005; Marubini *et al.*, 2009). There is only one European Site in Scotland listing harbour porpoise as a qualifying interest, the Inner Hebrides and the Minches SAC. In order to reach the CFIIS development site from the Inner Hebrides and Minches SAC, harbour porpoise would only need to travel approximately 30km within the marine environment. Furthermore, the Armadale Disposal Site is located within the Inner Hebrides and Minches SAC, which has been highlighted for the possible connectivity between individuals of the designated and the disposal site. Therefore, harbour porpoise will be taken forward for further assessment.

6.10 Ornithology

Ornithological species are only expected to be within the area of the proposed Armadale Disposal Site for foraging. It is acknowledged that some marine ornithological species also raft in open water, however it would generally be expected that this behaviour would be undertaken in areas close to suitable foraging, roosting and/or breeding grounds. Therefore, the potential impacts to ornithological species associated with the disposal of dredged material would only be expected to include resource deprivation, disturbance, and accidental physical injury. However, as Armadale Disposal Site operates as an existing dredge disposal site, it is expected to provide suboptimal foraging habitat for ornithological species. In particular, populations of prey species, including bivalves, crustaceans, fish and cephalopods are expected to be lower than that of local habitats. This is anticipated to be a result of ongoing

disturbance from vessel movements using the dredge disposal site and ongoing deposition of dredged material, which would be expected to degrade the quality of the local ecosystem, and subsequently the abundance of prey species. As such, temporary restriction of the area, or temporary changes to the spatial distribution of prey species, during the disposal of dredge material is not expected to result in significant resource deprivation to ornithological species. Furthermore, as birds are not generally expected to forage within the area of the Armadale Disposal Site, disturbance or accidental physical injury to ornithological species that could result in an LSE to any European Site is considered unlikely. Hence, potential ecological connectivity, and subsequently potential for LSE, between ornithological species and the Armadale Disposal Site will not be considered further. Nonetheless, a variety of different bird species are known to utilise habitats within the area of the CFIIS development site. Therefore, potential impacts to these species is being considered in more detail.

A breeding bird survey has previously been completed within the CFIIS development site (Atmos Consulting, 2022). The results of this survey, alongside species observations recorded during other ecological survey works, data provided by the Highland Raptor Group (Duncan, 2024) (with regards to golden eagle (*Aquila chrysaetos*) and species records available through NBN has been used to identify qualifying interests for scoping. Where a species has previously been identified within the area of the CFIIS development site, any European Site listing the species situated within the species maximum foraging range (as defined by NatureScot) has been included within the assessment for potential ecological connectivity (NatureScot, 2023a; NatureScot, 2023b; Scottish Natural Heritage (SNH) (now NatureScot), 2016). Where the maximum foraging distance of seabirds is unknown, a precautionary maximum foraging range of 15km has been assumed, as per NatureScot's guidance (NatureScot, 2023a). The maximum foraging range of each ornithological qualifying interest considered within this report is detailed in Appendix 1, Table A1.1 (as per NatureScot, 2023a; SNH, 2016).

Many of the species designated under the relevant SPAs are obligate pelagic species, meaning that they forage, migrate and over-winter in the marine environment. These species only encounter land, often in the form of cliffs, to breed in the summer, e.g., Northern gannet (*Morus bassanus)*. As such, species which fit these criteria have been scoped using the shortest distance through the marine environment from their designated site to the CFIIS development site, rather than the shortest distance terrestrially. This has only been done when a species' recommended foraging range is within the distance to the CFIIS to better represent real-world ecological connectivity. Not all species meet these criteria, e.g., lesser black-backed gulls (*Larus fuscus*), which are well known to inhabit terrestrial environments, in which case only the terrestrial shortest distance between an SPA and the CFIIS development is used.

In total, 31 European Sites designated for the presence of ornithological species were identified within the maximum foraging distances of bird species previously recorded within the area of the CFIIS. These sites will be considered further for potential ecological connectivity.

7 Screening for Ecological Connectivity and Likely Significant Effect

In order to determine whether there is potential for ecological connectivity between the CFIIS development site and/or Armadale Disposal Site and individual qualifying interests associated with European Sites included within the scope (as described in Section 6: Scope for Qualifying Interests), the location of works, works methodologies, location of the European Site and the ecology of the qualifying interest were considered.

Where potential ecological connectivity was identified, the qualifying interest is further assessed for LSE as a separate paragraph within the same table cell of each respective site's table e.g., Table 7.1.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Moidart and Ardgour SPA. The qualifying interests stated in Table 7.0.1 that have been identified as having LSE are detailed in each relevant site's section and an overview of these is shown in Table 8.0.1.

Table 7.0.1 provides an overview of the European Sites and associated qualifying interests that have been included within the screening for potential ecological connectivity, whether the associated qualifying interests have potential ecological connectivity and if one or more of the qualifying interests was further assessed for LSE. The assessment summary for each qualifying interest, which includes an assessment of LSE, is provided in the sections below. Table 7.0.1 also describes the distance and direction of each European Site to the proposed works area. However, it should be noted that for aquatic and pelagic bird species it is more appropriate to consider the distance within the marine environment, therefore distances within justifications for ecological connectivity discussed throughout Section 6: Scope for Qualifying Interests may differ from those detailed within Table 7.0.1.

Table 7.0.1: Overview of Screening Assessment for Potential Ecological Connectivity and Likely Significant Effect

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
Moidart and Ardgour SPA	1.5km West-North-West (WNW)	2.2km WNW	34.91km South-East (SE)	**Breeding:** • Golden eagle	Yes
Glen Etive and Glen Fyne SPA	4.3km South-South-East (SSE)	3.8km SSE	58.67km SSE	**Breeding:** • Golden eagle	Yes
Glen Creran Woods SAC	12.7km SSE	12.3km SSE	64.70km SSE	• Mixed woodland on base-rich soils associated with rocky slopes; • Otter; and • Western acidic oak woodland.	No
Loch Etive Woods SAC	12.7km SSE	12.3km SSE	72.98km SSE	• Alder woodland on floodplains; • Mixed woodland on base-rich soils associated with rocky slopes; • Otter; and • Western acidic oak woodland	No
Sunart SAC	16.0km West (W)	16.8km W	37.60km South (S)	• Dry heaths; • Mixed woodland on base-rich soils associated with rocky slopes; • Otter; • Reefs; • Western acidic oak woodland; and • Wet heathland with cross-leaved heath.	No
Eileanan Agus Sgeiran Lios Mor SAC	18.8km South-South-West (SSW)	18.9km SSW	59.93km SSE	• Harbour seal.	Yes

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
Rannoch Moor SAC	25.8km East-South-East (ESE)	25.2km ESE	78.54km SE	• Acidic peat-stained lochs and ponds; • Blanket bog; • Clear-water lochs with aquatic vegetation and poor to moderate nutrient levels; • Depressions on peat substrates; • Dry heaths; • Freshwater pearl mussel; • Otter; • Very wet mires often identified by an unstable 'quaking' surface; and • Wet heathland with cross-leaved heath.	No
Morvern Woods SAC	29.6km South-West (SW)	29.8km SW	56.29km S	• Mixed woodland on base-rich soils associated with rocky slopes; • Otter; and • Western acidic oak woodland.	No
Glen Beasdale SAC	33.6km WNW	34.2km North-West (NW)	18.65km SSE	• Freshwater pearl mussel; • Otter; and • Western acidic oak woodland.	No
Inner Hebrides and the Minches SAC	34.1km WNW	34.8km WNW	Armadale Disposal Site is within the SAC	• Harbour porpoise.	Yes
River Moriston SAC	48.9km North-North-East (NNE)	48.4km NNE	54.73km East (E)	• Atlantic salmon; and • Freshwater pearl mussel.	No

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
Rum SPA	60.4km WNW	61.1km WNW	17.21km W	**Breeding:** • Black-legged kittiwake (*Rissa tridactyla*); • Manx shearwater (*Puffinus puffinus*); and • Seabird assemblage.	Yes
				Breeding: • Golden eagle; • Common guillemot (*Uria aalge*); and • Red-throated diver (*Gavia stellata*).	No
Rum SAC	62.4km WNW	63.1km WNW	19.21km W	• Acid peat-stained lakes and ponds; • Acidic scree; • Alpine and subalpine heaths; • Base-rich fens; • Base-rich scree; • Blanket bog; • Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels; • Depressions on peat substrates; • Dry heaths; • Grasslands on soils rich in heavy metals; • Otter; • Plants in crevices on acid rocks; • Plants in crevices on base-rich rocks; • Species-rich grassland with mat-grass in upland areas; • Tall herb communities; and • Wet heathland with cross-leaved heath.	No

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
Canna and Sanday SPA	80.7km WNW	81.4km WNW	33.93km W	**Breeding:** • Herring gull (*Larus argentatus*); • Black-legged kittiwake; • Atlantic puffin (*Fratercula arctica*); and • Seabird assemblage.	Yes
				Breeding: • Common guillemot; and • European shag (*Phalacrocorax aristotelis*).	No
Shiant Isles SPA	141.4km NNW	141.5km NNW	92.48km NNW	**Breeding:** • Northern fulmar (*Fulmarus glacialis);* • Black-legged kittiwake; • Atlantic puffin; and • Seabird assemblage.	Yes
				Breeding: • Common guillemot; • Razorbill (*Alca torda);* and • European shag. **Non-breeding:** • Greenland barnacle goose (*Branta leucopsis*).	No

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
Forth Islands SPA	142.4km SE	141.7km SE	196.08km SE	**Breeding:** • Arctic tern (*Sterna paradisaea*); • Common tern (*Sterna Hirundo*); • Great cormorant (*Phalacrocorax carbo*); • Northern gannet; • Common guillemot; • Herring gull; • Black-legged kittiwake; • Lesser black-backed gull; • Atlantic puffin; • Razorbill; • Roseate tern (*Sterna dougallii*); • Sandwich tern (*Sterna sandvicensis*); • European shag; and • Seabird assemblage.	No
Mingulay and Berneray SPA	142.8km W	143.4km W	105.21km SSE	**Breeding:** • Northern fulmar; • Black-legged kittiwake; • Atlantic puffin; and • Seabird assemblage.	Yes
				Breeding: • Common guillemot; • Razorbill; and • European shag.	No

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
Outer Firth of Forth and St Andrews Bay Complex SPA	145.4km East-North-East (ENE)	144.7km ENE	193.31km North-East (NE)	**Breeding:** • Manx shearwater; and • Seabird assemblage.	Yes

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
Outer Firth of Forth and St Andrews Bay Complex SPA *continued*.				**Breeding:** • Arctic tern; • Common tern; • Northern gannet; • Common guillemot; • Herring gull; • Black-legged kittiwake; • Atlantic puffin; and • European shag. **Non-breeding:** • Black-headed gull (*Chroicocephalus ridibundus*); • Common gull (*Larus canus);* • Common scoter (*Melanitta nigra*); • Common eider (*Somateria mollissima*); • Common goldeneye (*Bucephala clangula*); • Common guillemot; • Herring gull; • Black-legged kittiwake; • Little gull (*Hydrocoloeus minutus*); • Long-tailed duck (*Clangula hyemalis*); • Razorbill; • Red-breasted merganser (*Mergus serrator*); • Red-throated diver; • European shag; • Slavonian grebe (*Podiceps auritus*); • Velvet scoter (*Melanitta fusca*); • Seabird assemblage; and • Waterfowl assemblage.	No

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
Ailsa Craig SPA	161.2km S	160.8km S	203.53km SSE	**Breeding:** • Northern gannet; • Black-legged kittiwake; • Lesser black-backed gull; and • Seabird assemblage.	Yes
				Breeding: • Common guillemot; and • Herring gull.	No
Handa SPA	181.5km N	181.2km N	149.23km NNE	**Breeding:** • Northern fulmar; • Great skua (*Stercorarius skua*); • Black-legged kittiwake; and • Seabird assemblage.	Yes
				Breeding: • Common guillemot; and • Razorbill.	No
East Caithness Cliffs SPA	183.2km NNE	182.5km NNE	179.80km NE	**Breeding:** • Northern fulmar; and • Seabird assemblage.	Yes

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
East Caithness Cliffs SPA *continued.*				**Breeding:** • Great cormorant; • Great black-backed gull (*Larus marinus*); • Common guillemot; • Herring gull; • Black-legged kittiwake; • Peregrine (*Falco peregrinus*); • Razorbill; and • European shag.	No
Fowlsheugh SPA	186.1km E	185.1km E	224.81km E	**Breeding:** • Northern fulmar; and • Seabird assemblage.	Yes
				Breeding: • Common guillemot; • Herring gull; • Black-legged kittiwake; and • Razorbill.	No
Troup, Pennan and Lion's Head SPA	204.3km NE	203.5km ENE	223.68km ENE	**Breeding:** • Northern fulmar; and • Seabird assemblage.	Yes
				Breeding: • Common guillemot; • Herring gull; • Black-legged kittiwake; and • Razorbill.	No

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
Cape Wrath SPA	205.0km N	204.8km N	174.99km NNE	**Breeding:** • Northern fulmar; and • Seabird assemblage.	Yes
				Breeding: • Common guillemot; • Black-legged kittiwake; • Atlantic puffin; and • Razorbill.	No
Seas off St Kilda SPA	209.4km NW	209.7km NW	156.78km NW	**Breeding:** • Northern fulmar; • Northern gannet; • Atlantic puffin; • European storm-petrel (*Hydrobates pelagicus);* and • Seabird assemblage.	Yes
				Breeding: • Common guillemot.	No
Buchan Ness to Collieston Coast SPA	211.1km ENE	210.2km ENE	239.89km E	**Breeding:** • Northern fulmar; and • Seabird assemblage.	Yes

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
Buchan Ness to Collieston Coast SPA				**Breeding:** • Common guillemot; • Herring gull; • Black-legged kittiwake; and • European shag.	No
Flannan Isles SPA	218.3km NW	218.8km NNW	165.13km NW	**Breeding:** • Northern fulmar; • Black-legged kittiwake; • Leach's storm-petrel (*Hydrobates leucorhous*); and • Seabird assemblage.	Yes
				Breeding: • Common guillemot; • Atlantic puffin; and • Razorbill.	No
North Caithness Cliffs SPA	219.4km NNE	218.8km NNE	204.29km NNE	**Breeding:** • Northern fulmar; and • Seabird assemblage.	Yes
				Breeding: • Common guillemot; • Black-legged kittiwake; • Peregrine; • Atlantic puffin; and • Razorbill.	No

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
St Kilda SPA	224.0km NW	224.7km NW	171.47km NW	**Breeding:** • Northern fulmar; • Northern gannet; • Great skua; • Black-legged kittiwake; • Leach's storm-petrel; • Manx shearwater; • European storm-petrel; and • Seabird assemblage.	Yes
				Breeding: • Common guillemot; • Atlantic puffin; and • Razorbill.	No
Hoy SPA	254.0km NNE	253.4km NNE	243.19km NE	**Breeding:** • Northern fulmar; • Great skua; and • Seabird assemblage.	Yes
				Breeding: • Arctic skua (*Stercorarius parasiticus*); • Great black-backed gull; • Common guillemot; • Black-legged kittiwake; • Peregrine; • Atlantic puffin; and • Red-throated diver.	No

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
Sule Skerry and Sule Stack SPA	257.4km NNE	257.1km NNE	231.16km NNE	**Breeding:** • Northern gannet; • Leach's storm-petrel; and • Seabird assemblage.	Yes
				Breeding: • Common guillemot; • Atlantic puffin; • European shag; and • European storm-petrel.	No
North Rona and Sula Sgeir SPA	265.9km N	265.7km N	227.06km N	**Breeding:** • Northern fulmar; • Northern gannet; • Leach's storm-petrel; and • Seabird assemblage.	Yes
				Breeding: • Great black-backed gull; • Common guillemot; • Black-legged kittiwake; • Atlantic puffin; • Razorbill; and • European storm-petrel.	No
Copinsay SPA	281.8km NNE	281.2km NNE	274.90km NE	**Breeding:** • Northern fulmar; and • Seabird assemblage.	Yes

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
Copinsay SPA *continued.*				**Breeding:** • Great black-backed gull; • Black-legged kittiwake; and • Common guillemot.	No
Rousay SPA	297.2km NNE	296.6km NNE	283.61km NNE	**Breeding:** • Northern fulmar; and • Seabird assemblage.	Yes
				Breeding: • Arctic skua; • Arctic tern; • Common guillemot; and • Black-legged kittiwake.	No
West Westray SPA	310.9km NNE	310.3km NNE	296.73km NNE	**Breeding:** • Northern fulmar; and • Seabird assemblage.	Yes
				Breeding: • Arctic skua; • Arctic tern; • Common guillemot; • Black-legged kittiwake; and • Razorbill.	No
Calf of Eday SPA	314.02km NNE	313.4km NNE	303.03km NNE	**Breeding:** • Northern fulmar; and • Seabird assemblage.	Yes

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
Calf of Eday SPA *continued.*				**Breeding:** • Great cormorant; • Great black-backed gull; • Common guillemot; and • Black-legged kittiwake.	No
Seas off Foula SPA	387.3km NNE	387.0km NNE	380.75km NNE	**Breeding:** • Northern fulmar; • Great skua; and • Seabird assemblage. **Non-breeding:** • Northern fulmar; • Great skua; and • Seabird assemblage.	Yes
				Breeding: • Arctic skua; • Common guillemot; and • Atlantic puffin. **Non-breeding:** • Common guillemot.	No
Sumburgh Head SPA	416.0km NNE	415.3km NNE	408.53km NE	**Breeding:** • Northern fulmar; and • Seabird assemblage.	Yes
				Breeding: • Arctic tern; • Common guillemot; and • Black-legged kittiwake.	No

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
Foula SPA	416.3km NNE	415.7km NNE	401.71km NE	**Breeding**: • Northern fulmar; • Great skua; • Leach's storm-petrel; and • Seabird assemblage.	Yes
				Breeding: • Arctic skua; • Arctic tern; • Common guillemot; • Black-legged kittiwake; • Atlantic puffin; • Razorbill; and • Red-throated diver.	No
Noss SPA	449.4km NNE	448.8km NNE	440.78km NE	**Breeding:** • Northern fulmar; • Northern gannet; • Great skua; and • Seabird assemblage.	Yes
				Breeding: • Common guillemot; • Black-legged kittiwake; and • Atlantic puffin.	No

European Site	Approximate Distance and Direction			Qualifying Interest(s)	Potential Ecological Connectivity Identified (Yes/No)
	Between Ardgour Development Site and European Site	Between Nether Lochaber Development Site and European Site	Between Armadale Disposal Site and European Site		
Hermaness, Saxa Vord and Valla Field SPA	510.1km NNE	509.4km NNE	497.61km NNE	**Breeding:** • Northern fulmar; • Great skua; and • Seabird assemblage.	Yes
				Breeding: • Northern gannet; • Common guillemot; • Black-legged kittiwake; • Atlantic puffin; • Red-throated diver; and • European shag.	No

7.1 Moidart and Ardgour SPA

The Moidart and Ardgour SPA is a large, predominantly upland site in the Western Highlands of Scotland. The site rises from sea level to approximately 900 metres (m) and encompasses a diverse range of habitats including heather moorland, rough grassland, blanket bog, native woodland, montane heaths and exposed rock and scree. There are also numerous freshwater lochs and river systems (SNH, 2010b).

Moidart and Ardgour SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting a population of European importance of the Annex 1 species, golden eagle (SNH, 2010b).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interest associated with the Moidart and Ardgour SPA determined that there was potential ecological connectivity between the CFIIS development site and the population of golden eagle (Table 7.1.1). As such, golden eagle, as qualifying interest of the Moidart and Ardgour SPA, were taken forward for screening for LSE (Table 7.1.1). It was assessed that there was LSE for golden eagle associated with the Moidart and Ardgour SPA, which were then taken forward to the assessment of adverse effects (Section 8.1: Moidart and Ardgour SPA).

Table 7.1.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Moidart and Ardgour SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding golden eagle	Yes	The core foraging range of golden eagle from its nest site is 6km, with a maximum range of up to 9km (SNH, 2016) (Appendix 1: Table A1.1). Therefore, the CFIIS development site lies within the theoretical foraging range of golden eagle associated with the SPA (being situated approximately 1.4km away). Furthermore, there are known records of golden eagle within 9km of the CFIIS site (Duncan, 2024). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of golden eagle associated with the Moidart and Ardgour SPA. Due to the proximity of the designated site to the CFIIS and the possibility that a golden eagle core range includes all or part of the CFIIS site, there is LSE for golden eagle associated with the Moidart and Ardgour SPA.

7.2 Glen Etive and Glen Fyne SPA

Glen Etive and Glen Fyne SPA is a large, predominantly upland site in the south-west Highlands of Scotland. The site rises from sea level to over 1100m and encompasses a diverse range of habitats including heather moorland, rough grassland, blanket bog, native woodland, montane heaths and exposed rock and scree. There are also numerous freshwater lochs and river systems (SNH, 2010a).

Glen Etive and Glen Fyne SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting a population of European importance of the Annex 1 species, golden eagle (SNH, 2010a).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interest associated with the Glen Etive and Glen Fyne SPA determined that there was potential ecological connectivity between the CFIIS development site and the population of golden eagle associated with the SPA (Table 7.2.1). As such, golden eagle, as the qualifying interest of the Glen Etive and Glen Fyne SPA, were taken forward for screening for LSE (Table 7.2.1). It was assessed that there was LSE for golden eagle associated with the Glen Etive and Glen Fyne SPA, which were then taken forward to the assessment of adverse effects (Section 8.2: Glen Etive and Glen Fyne SPA).

Table 7.2.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Glen Etive and Glen Fyne SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding golden eagle	Yes	The core foraging range of golden eagle from its nest site is 6km, with a maximum range of up to 9km (Table A1.1) (SNH, 2016). Therefore, the CFIIS development site lies within the theoretical foraging range of golden eagle associated with the SPA (being situated approximately 4km away). Furthermore, there are known records of golden eagle within 9km of the CFIIS site (Duncan, 2024). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of golden eagle associated with the Glen Etive and Glen Fyne SPA. Due to the proximity of the designated site to the CFIIS and the possibility that a golden eagle core range includes all or part of the CFIIS site, there is LSE for golden eagle.

7.3 Glen Creran Woods SAC

Glen Creran Woods SAC is located on the west coast of Scotland, in the area of Argyll and Bute. The SAC is largely comprised of 60% broad-leaved deciduous woodland (NatureScot, 2020c). In total the SAC covers an area of 705.91 hectares (ha), extending from just above sea level to a height of 330m above sea level. Qualifying interests include mixed woodland on base-rich soils associated with rocky slopes, western acidic oak woodland, and otter (NatureScot, 2020c). The old sessile oak woods contain examples of *Tilio-Acerion* forests of slopes, screes, and ravines. The woodland is of outstanding importance for the rich communities of mosses and lichens which it supports (Joint Nature Conservation Committee (JNCC), 2024a).

An assessment for potential ecological connectivity between the CFIIS development site and the qualifying interests associated with the Glen Creran Woods SAC determined that there was unlikely to be ecological connectivity between the CFIIS development site and the population of otter associated with the SAC (Table 7.3.1). In addition, it would be considered unlikely that the works associated with the CFIIS would have any pathway to impact upon terrestrial habitats associated with the Glen Creran Woods SAC (Table 7.3.1) As such, none of the qualifying interests of the SAC will be taken forward for assessment for LSE, and the Glen Creran Woods SAC will not be considered further.

Table 7.3.1: Assessment for Potential Ecological Connectivity of the Qualifying Interests Associated with the Glen Creran Woods SAC

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Mixed woodland on base-rich soils associated with rocky slopes	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, there is no ecological connectivity would be expected to terrestrial habitats situated ≥12.3km away (i.e. the distance between the Glen Creran Woods SAC and the CFIIS development site).
Otter	No	In a marine environment, otter do not generally forage at a range >10km (Chanin, 2013). However, to reach the CFIIS development site from the Glen Creran Woods SAC, otter would need to travel approximately 33km through the marine environment. Otter can travel at greater distances through freshwater habitats (up to 32km) (NatureScot, 2024). However, no appropriate routes were identified at those distance. Therefore, ecological connectivity between the Glen Creran Woods SAC and the CFIIS development site is considered unlikely. In order to reach the Armadale Disposal Site, otter would need to travel even greater distances of approximately 123.4km through the marine environment. As such, ecological connectivity between the Glen Creran Woods SAC and the proposed Armadale Dredge Disposal site is also considered unlikely.
Western acidic oak woodland	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥12.3km away (i.e. the distance between the Glen Creran Woods SAC and the CFIIS development site).

7.4 Loch Etive Woods SAC

Loch Etive Woods SAC is spread along the edges of Loch Etive on the west coast of Scotland, in Argyll and Bute. The SAC covers an area totalling 2642.59ha and is one of three sites representing old sessile oak woods in the most bryophyte-rich zone in the UK, the south-west Highlands zone. Qualifying interests include mixed woodland on base-rich soils associated with rocky slopes, western acidic oak woodland, alder woodland on floodplains and otter (NatureScot, 2020d).

Some good examples of *Tilio-Acerion* Forest occur in the deeply incised rocky gorges associated with Glen Nant and in the nearby Coille Leitire. These sites are representative of the habitat type in western Scotland and comprise stands of ash woodland with a hazel understorey and a rich field layer of tall herbs and woodland grasses on base-rich soils characteristic of the habitat (JNCC, 2024b).

The diversity of soils and physical conditions leads to transitions between oakwood and both wet alder and base-rich ash-elm-hazel (*Fraxinus excelsior-Ulmus-Corylus avellana*) stands, giving additional patterns of structural variation and transitions (JNCC, 2024b). Additionally, the woods support important populations of the rare, chequered skipper butterfly (JNCC, 2024b).

An assessment for potential ecological connectivity between the CFIIS development site and the qualifying features associated with the Loch Etive Woods SAC. It was determined that there was not potential ecological connectivity between the CFIIS development site, and the populations of otter associated with the SAC (Table 7.4.1). In addition, it would be considered unlikely that the works associated with the CFIIS would have any pathway to impact upon terrestrial habitats associated with the Loch Etive Woods SAC (Table 7.4.1). As such, none of the qualifying interests of the SAC will be taken forward for assessment for LSE, and the Loch Etive Woods SAC will not be considered further.

Table 7.4.1: Assessment for Potential Ecological Connectivity of the Qualifying Interests Associated with the Loch Etive Woods SAC

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Otter	No	In a marine environment, otter do not generally forage at a range >10km (Chanin, 2013). However, in order to reach the CFIIS development site from the Loch Etive Woods SAC, otter would need to travel approximately 45km through the marine environment. In a freshwater environment, otter generally forage up to 32km (NatureScot, 2024), although it is advised within the Conservation management advice for the Loch Etive Woods SAC that home range of some male otters within the site may be as far as 80km within the freshwater environment (NatureScot, 2020d). Nonetheless, no feasible route was identified, connecting freshwater tributaries from the SAC to the CFIIS development site. As such ecological connectivity between the Loch Etive Woods SAC and the CFIIS development site is considered unlikely. In the marine environment an otter would need to travel approximately 45km to the CFIIS development site which is far beyond their expected coastal foraging limits of 10km (Chanin, 2013). Furthermore, it would 120.5km by the marine environment from the Loch Etive Woods SAC boundary to the closest dredge disposal site of Armadale (HE070) which would not be feasible for the species. Due to these distances, the Loch Etive Woods SAC is not considered to have potential ecological connectivity.
Mixed woodland on base-rich soils associated with rocky slopes	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, there is no ecological connectivity would be expected to terrestrial habitats situated ≥12.3km away (i.e. the distance between the Loch Etive Woods SAC and the CFIIS development site.
Western acidic oak woodland	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥12.3km away (i.e. the distance between the Loch Etive Woods SAC and the CFIIS development site.
Alder woodland on floodplains	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥12.3km away (i.e. the distance between the Loch Etive Woods SAC and the CFIIS development site.

7.5 Sunart SAC

Sunart SAC is located on the west coast of Scotland, within the area of the Highlands and Islands. The SAC has an area of 10230.22ha, of which 53.6% is marine (JNCC, 2015). The area supports a high density of otter, which is the only species listed as a qualifying interest of the SAC. Otters forage in the shallows of Loch Sunart and take advantage of influxes of freshwater around the site (JNCC, 2024c).

Five habitat types are also listed as qualifying interests of the SAC, including dry heaths, mixed woodland on base-rich soils associated with rocky slopes, reefs, western acidic oak (*Quercus robur*) woodland and wet heathland with cross-leaved heath (*Erica tetralix*). The SAC is oak-dominated, containing the richest complex of Atlantic bryophyte-rich old sessile oak woods (a primary reason for the site's selection) in the UK, representative of the mid-west Highlands bryophyte zone (JNCC, 2024c).

With a varied woodland canopy containing areas of birch (*Betula spp*.), ash (*Fraxinus excelsior*) and hazel (*Corylus avellana*), and alder (*Alnus glutinosa*) on wet ground, the woods support a rich fern flora along with the rare, chequered skipper butterfly (*Carterocephalus palaemon*) (JNCC, 2024c).

Reefs are not a priority habitat in the Sunart SAC and are instead covered by the Loch Sunart Nature Conservation Marine Protected Area (MPA(NC)), due to the presence of biogenic reefs, created by flame shell beds and serpulid aggregations (SNH, 2014).

An assessment for potential ecological connectivity between the CFIIS development site and the qualifying features associated with the Sunart SAC determined that there was not potential ecological connectivity between the CFIIS development site, and the populations of otter associated with the SAC (Table 7.5.1). In addition, it would be considered unlikely that the works associated with the CFIIS would have any pathway to impact upon terrestrial or marine habitats associated with the Sunart SAC (Table 7.5.1). As such, none of the qualifying interests of the SAC will be taken forward for assessment for LSE, and the Sunart SAC will not be considered further.

Table 7.5.1: Assessment for Potential Ecological Connectivity of the Qualifying Interests Associated with the Sunart SAC

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Dry heaths	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥16.0km away (i.e. the distance between the Sunart SAC and the CFIIS development site.
Mixed woodland on base-rich soils associated with rocky slopes	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥16.0km away (i.e. the distance between the Sunart SAC and the CFIIS development site.
Otter	No	In the marine environment an otter would need to travel approximately 69km to the proposed development site which is far beyond their expected coastal foraging limits of 10kms (Chanin, 2013). There are no freshwater routes that would connect the SAC to the CFIIS development site. Furthermore, it would 60km from the Sunart SAC boundary to the closest dredge disposal site of Armadale (HE070) which would not be feasible for the species. Due to these distances, Sunart SAC is not considered to have potential ecological connectivity.
Reefs	No	The reefs of the Sunart SAC are static and would only be impacted by development through the marine environment. It is 60km and 69km to the closest Armadale Dredge Disposal site and CFIIS development site, respectively. Any marine habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected between the CFIIS development site and marine habitats associated with the Sunart SAC.
Western acidic oak woodland	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥16.0km away (i.e. the distance between the Sunart SAC and the CFIIS development site.
Wet heathland with cross-leaved heath	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥16.0km away (i.e. the distance between the Sunart SAC and the CFIIS development site.

7.6 Eileanan Agus Sgeiran Lios Mor SAC

The Eileanan Agus Sgeiran Lios Mór SAC has been designated to protect harbour seals (NatureScot, 2024a). The island of Lismore on the west coast of Scotland provides the most sheltered and enclosed site for the harbour seal. Lismore is a composite site comprising five groups of small offshore islands and skerries which are extensively used as haul-out sites by the colony. Seal numbers represent just over 1% of the UK population (JNCC, 2024d).

An assessment for potential ecological connectivity between the CFIIS development site and the qualifying interest associated with the Eileanan Agus Sgeiran Lios Mor SAC determined that there was potential ecological connectivity between the CFIIS development, and the harbour seal population associated with the SAC (Table 7.6.1). As such, harbour seal, as a qualifying interest of the Eileanan Agus Sgeiran Lios Mor SAC, were taken forward for screening for LSE (Table 7.6.1). It was assessed that there was LSE for harbour seal associated with the Eileanan Agus Sgeiran Lios Mór SAC, which were then taken forward to the assessment of adverse effects (Section 8.3: Eileanan Agus Sgeiran Lios Mór SAC).

Table 7.6.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Eileanan Agus Sgeiran Lios Mor SAC

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Harbour seal	Yes	Harbour seal foraging ranges are typically 40–50km from their regular haul-out site (Lyons, 2004). In order to reach the waters around the CFIIS development site from the Eileanan Agus Sgeiran Lios Mor SAC, harbour seal would only need to travel approximately 20km through the marine environment. In addition, there are records of the species within the waters around the Corran Narrows (NBN, 2025). Therefore, there is considered to be potential for ecological connectivity between the populations of harbour seal associated with the SAC and the CFIIS development site. However, in order to reach the Armadale Disposal Site from the Eileanan Agus Sgeiran Lios Mor SAC, harbour seal would need to travel approximately 95km through the marine environment, which is outside of the expected foraging range for the species (Lyons, 2004). Therefore, ecological connectivity between the population of harbour seal associated with the Eileanan Agus Sgeiran Lios Mor SAC and the proposed Armadale Dredge Disposal site is considered unlikely. Due to the close proximity of the designated site to the CFIIS development and it being within the foraging range of harbour seal, there is LSE for harbour seal associated with the Eileanan Agus Sgeiran Lios Mor SAC.

7.7 Rannoch Moor SAC

Rannoch Moor SAC, located in the southern Scottish Highlands, has a designated area of 10113.57ha with the majority habitat assessed as 'bogs, marshes, water fringed vegetation, ferns' (72%) lying in a high-level basin at an approximate altitude of 300m (NatureScot, 2021).

The qualifying features of the SAC include seven habitats and two species: clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels, acid peat-stained lakes and ponds, wet heathland with cross-leaved heath, dry heaths, blanket bog, very wet mires often identified by an unstable 'quaking' surface, depressions on peat substrates, freshwater pearl mussel, and otter (NatureScot, 2021).

The Rannoch Moor SAC contains the most extensive complex of western blanket bog and soligenous/valley mire in Britain encompassing many connected smaller bodies of (nutrient-poor) freshwater which support vegetation typical of oligotrophic to mesotrophic standing waters including water lobelia (*Lobelia dortmanna*) and bulbous rush (*Juncus bulbosus*). Many of the small lochans at the site (such as Lochan na h-Achlaise, and Lochan na Stainge) have a nutrient-poor status due to their predominantly peaty substrate which are consequently only able to support low species diversity. In addition, the site supports other uncommon species including least water-lily (*Nuphar pumila*) and floating bur-reed (*Sparganium angustifolium*) (JNCC, 2024e).

The west of the site contains a high proportion of purple moor-grass (*Molinia caerulea*) and woody dwarf-shrubs to the east. Additionally, the bog's unusual transition mire supports Rannoch-rush (*Scheuchzeria palustris*), the only known location in the UK (JNCC, 2024e).

Otters are generally highly mobile with varying home ranges and the population present at the SAC are reliant on the surrounding wider countryside habitat for access to foraging areas as well as continuous access to unpolluted open water (NatureScot, 2021).

An assessment for potential ecological connectivity between the CFIIS development site and the qualifying features associated with the Rannoch Moor SAC. It was determined that there was not potential ecological connectivity between the CFIIS development site, and the otter population associated with the SAC (Table 7.7.1). In addition, it would be considered unlikely that the works associated with the CFIIS would have any pathway to impact upon terrestrial habitats associated with the Rannoch Moor SAC (Table 7.7.1). As such, none of the qualifying interests of the SAC will be taken forward for assessment for LSE, and the Rannoch Moor SAC will not be considered further.

Table 7.7.1: Assessment for Potential Ecological Connectivity of the Qualifying Interests Associated with the Rannoch Moor SAC

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Acid peat-stained lakes and ponds	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥25.8km away (i.e. the distance between the Rannoch Moor SAC and the CFIIS development site).
Blanket bog	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥25.8km away (i.e. the distance between the Rannoch Moor SAC and the CFIIS development site).
Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥25.8km away (i.e. the distance between the Rannoch Moor SAC and the CFIIS development site).
Depressions on peat substrates	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥25.8km away (i.e. the distance between the Rannoch Moor SAC and the CFIIS development site).
Dry heaths	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥25.8km away (i.e. the distance between the Rannoch Moor SAC and the CFIIS development site).
Freshwater pearl mussel	No	The CFIIS development site is not expected to have any direct connectivity upon freshwater pearl mussel populations as the respective water bodies are not directly connected. The larval phase of freshwater pearl mussel, and therefore successful recruitment, is reliant on the integrity of the salmon population (Taeubert and Geist, 2017). However, Atlantic salmon are not a designated feature in the Rannoch Moor SAC, so any population found within the SAC is presumed to be unaffected. As such, no ecological connectivity between the CFIIS development site and the freshwater pearl mussel population associated with the Rannoch Moor SAC is anticipated.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Otter	No	Male freshwater ranges are typically expected up to 32km and although recognised in the conservation management advice for this site that home range of some male otters may be as far as 80km in freshwater (NatureScot, 2021), the Rannoch Moor SAC is not connected by a continuous body of water the CFIIS development site <80km. If individuals were capable of travelling from the SAC via River Etive approximately 20km to reach the marine Loch Etive and 87km total from the SAC to the CFIIS development site. This route is far beyond their expected coastal foraging limits of 10km (Chanin, 2013) and the same is true for reaching the closest dredge disposal site of Armadale (HE070) via the marine environment. Due to these distances, it is not considered to have potential ecological connectivity.
Very wet mires often identified by an unstable 'quaking' surface	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥25.8km away (i.e. the distance between the Rannoch Moor SAC and the CFIIS development site).
Wet heathland with cross-leaved heath	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥25.8km away (i.e. the distance between the Rannoch Moor SAC and the CFIIS development site).

7.8 Morvern Woods SAC

The Morvern Woods SAC on Scotland's west coast totals an area of 1924.86ha mostly made up of woodland across five distinct areas. The area has three qualifying features: Mixed woodland on base-rich soils associated with rocky slopes, Western acidic oak woodland, the Otter (NatureScot, 2020e)

The woods in this complex of *Tilio-Acerion* forests range from low stunted hazel-dominated woods at Drimnin to extensive ash-dominated stands on the coastal scree and gorges at Inninmore (JNCC, 2024f). Oak with birch dominate on the predominantly acidic soils, and ash, wych elm (*Ulmus glabra*) and hazel are present on more base-rich soils. Rich lichen, bryophyte flora, and vascular plant flora are present with several highly oceanic species, such as hay-scented buckler fern (*Dryopteris aemula*) and Tunbridge filmy fern (*Hymenophyllum tunbrigense*) (JNCC, 2024f).

The rocky slopes of the SAC are a preferred habitat for otters in coastal areas and in combination with close access to coastal waters for foraging the site is ideal for the population in Morvern Wood. They are able to utilise resources at both the surrounding wider countryside and the coastal environment but will mainly feed in coastal waters located at the site boundaries (NatureScot, 2020e).

An assessment for potential ecological connectivity between the CFIIS development site and the qualifying features associated with the Morvern Woods SAC. It was determined that there was not potential ecological connectivity between the CFIIS development site, and the otter population associated with the SAC (Table 7.8.1). In addition, it would be considered unlikely that the works associated with the CFIIS would have any pathway to impact upon terrestrial habitats associated with the Morvern Woods SAC (Table 7.8.1) As such, none of the qualifying interests of the SAC will be taken forward for assessment for LSE, and the Morvern Woods SAC will not be considered further.

Table 7.8.1: Assessment for Potential Ecological Connectivity of the Qualifying Interests Associated with the Morvern Woods SAC

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Mixed woodland on base-rich soils associated with rocky slopes	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥29.6km away (i.e. the distance between the Morvern Woods SAC and the CFIIS development site).
Otter	No	The closest boundary of the SAC estimates a distance of 30km to the CFIIS development site which is triple the expected marine foraging limits of the species (Chanin, 2013). Due to the location of the SAC relative to the CFIIS development site it is unlikely that there would be potential ecological connectivity. Furthermore, it would take a journey of 64km by the marine environment from the closest Morvern Woods SAC boundary, relative to the dredge site, to the closest dredge disposal site of Armadale (HE070) which would not be feasible for the species. Due to these distances, it is not considered to have potential ecological connectivity.
Western acidic oak woodland	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥29.6km away (i.e. the distance between the Morvern Woods SAC and the CFIIS development site).

7.9 Glen Beasdale SAC

Glen Beasdale SAC is an extensive designated site being one of the largest oakwoods in Lochaber with 546.37ha containing 60% Broad-leaved deciduous woodland (NatureScot, 2020f).

The coastal site has three qualifying features: western acidic oak woods, freshwater Pearl mussel, and otter. The SAC is an extensive coastal area of old sessile oak wood on acid soils and has a healthy ground cover with heather (*Calluna vulgaris*) and purple moor-grass along with a presence of rich bryophyte and lichen flora that thrive at the site. Inland at higher altitudes of the site the species transition to a birch-dominated area (JNCC, 2024g).

The rocky slopes with close proximity to the coastal environment is a preferred habitat for otters and are able to utilise resources at both surrounding wider countryside and the coastal environment but will mainly feed in coastal waters located at the site boundaries of the Glen Beasdale SAC (JNCC, 2024g).

An assessment for potential ecological connectivity between the CFIIS development site and the qualifying features associated with the Glen Beasdale SAC. It was determined that there was not potential ecological connectivity between the CFIIS development site, and the otter population associated with the SAC (Table 7.9.1). In addition, it would be considered unlikely that the works associated with the CFIIS would have any pathway to impact upon terrestrial habitats associated with the Glen Beasdale SAC (Table 7.9.1) Furthermore, the populations of freshwater pearl mussel are not designated alongside Atlantic salmon, which the mussel is dependent on for recruitment (Table 7.9.1). As such, none of the qualifying interests of the SAC will be taken forward for assessment for LSE, and the Glen Beasdale SAC will not be considered further.

Table 7.9.1: Assessment for Potential Ecological Connectivity of the Qualifying Interests Associated with the Glen Beasdale SAC.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Freshwater pearl mussel	No	The CFIIS development site is not expected to have any direct connectivity upon freshwater pearl mussel populations as the respective water bodies are not directly connected. The larval phase of freshwater pearl mussel, and therefore successful recruitment, is reliant on the integrity of the salmon population (Taeubert and Geist, 2017). However, Atlantic salmon are not a designated feature in the Glen Beasdale SAC, so any population found within the SAC is presumed to be unaffected. As such, no ecological connectivity between the CFIIS development site and the freshwater pearl mussel population associated with the Glen Beasdale SAC is anticipated.
Otter	No	The expected coastal range for an otter is estimated at 10km and usually 32km in freshwater environments (Chanin, 2013). There is no possible freshwater route that would allow an otter from the Glen Beasdale SAC population to travel east and be within the vicinity of the CFIIS development site and the approximate distance via the marine environment is 112.5km. The distance between the boundary of the Glen Beasdale SAC and the closest dredge disposal site of Armadale (HE070) is approximately 15km via the marine environment which is beyond the expected range for a coastal Otter.
Western acidic oak woodland	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥33.6km away (i.e. the distance between the Glen Beasdale SAC and the CFIIS development site).

7.10 Inner Hebrides and the Minches SAC

The Inner Hebrides and the Minches SAC supports the conservation of harbour porpoise within the West Scotland Management Unit (MU), extending much of the West Scotland coastline. Within the UK portion of the West Scotland MU an estimated 24,305 individuals utilise the habitat (Inter-Agency Marine Mammal Working Group (IAMMWG), 2022). Harbour porpoise are present year-round utilising the entirety of the SAC in above average numbers containing the highest density of the species in Scotland providing protection for approximately 32% of the population found on the west coast of Scotland (NatureScot, 2024b).

The SAC is 100% marine with 1381391.37ha total and contains the Armadale Dredge Disposal site that will be used for the CFIIS development (JNCC, 2019). The area covered ranges from 30-250m in depth and provides the species with a good foraging habitat with harbour porpoise typically seen at higher densities between depths of 50-150m and it is rare to observe the species in depths >200m (NatureScot, 2024b).

An assessment for potential ecological connectivity between the CFIIS development site and the qualifying feature harbour porpoise associated with the Inner Hebrides and the Minches SAC determined that there was potential ecological connectivity between the CFIIS development site, and the harbour porpoise population associated with the SAC (Table 7.10.1). Therefore, harbour porpoise, were taken forward for screening for LSE (Table 7.10.1). It was assessed that there was LSE for harbour porpoise associated with the Inner Hebrides and the Minches SAC, which were then taken forward to the assessment of adverse effects (Section 8.4: Inner Hebrides and the Minches SAC)

Table 7.10.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Inner Hebrides and the Minches SAC

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Harbour porpoise	Yes	The harbour porpoise is well sighted within the Inner Hebrides and the Minches SAC utilising the entire area (NatureScot, 2024b) and has a core range of 300km^2 (Johnston *et al.*, 2005; Marubini *et al.*, 2009). The boundary of the SAC is only 31.5km by sea from the boundary to the CFIIS development site. Therefore, well within expected range and is likely to have potential ecological connectivity. Furthermore, the closest dredge disposal site of Armadale (HE070) is located within the SAC which is likely to have potential ecological connectivity. Due to the close proximity of the designated site to the CFIIS development and dredge disposal site, and both areas being within the foraging range of harbour porpoise, there is LSE for harbour porpoise associated with the Inner Hebrides and the Minches SAC.

7.11 River Moriston SAC

The River Moriston, which makes up the River Moriston SAC, flows into the northern side of Loch Ness and supports a functional freshwater pearl mussel population. Freshwater pearl mussels are present from downstream of a hydro-electric dam to the confluence with Loch Ness. Due to illegal pearl-fishing the population is not abundant but survey results show that 40% of the population is composed of juveniles. This is the highest percentage recorded in any Scottish freshwater pearl mussel population and indicates that recent successful recruitment has taken place (JNCC, 2024h).

The River Moriston SAC also support a population of Atlantic salmon (JNCC, 2024h). In Europe, Atlantic salmon SACs generally extend to the tidal limit of rivers. However, the downstream limit of the River Moriston SAC does not extend to the tidal limit and is instead located at Roinn Inbhir, on the shores of Loch Ness. The Ness District Salmon Fishery Board has a voluntary catch and release policy which is strongly promoted, with the need for mandatory catch and release reviewed annually (NatureScot, 2019).

No potential ecological connectivity was identified between the CFIIS development site and the populations of Atlantic salmon and freshwater pearl mussel associated with the SAC (Table 7.11.1). As such, neither of the qualifying interests of the SAC will be taken forward for assessment for LSE, and the River Moriston SAC will not be considered further.

Table 7.11.1: Assessment for Potential Ecological Connectivity of the Qualifying Interests Associated with the River Moriston SAC

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Atlantic salmon	No	There are records of Atlantic salmon in the waters within the vicinity of the CFIIS development site, therefore the species are known to be present locally (NBN, 2025). Atlantic salmon live in freshwater as juveniles and within the marine environment as adults, only returning to rivers to spawn. The mouth of the River Moriston is situated in Invermoriston, where the water flows into Loch Ness, connected to the North Sea via the River Ness. Studies have shown that post-smolts migrate towards open marine areas and do not stay close to shore, unless strong currents impede this (Malcolm *et al*., 2010). Therefore, as the Atlantic salmon will head for open marine areas and will enter a different water body to the CFIIS development site, it is considered unlikely that there would be ecological connectivity between the CFIIS development site and the Atlantic salmon associated with the River Moriston SAC.
Freshwater pearl mussel	No	The CFIIS development site is not expected to have any direct connectivity upon freshwater pearl mussel populations as the respective water bodies are not directly connected. The larval phase of freshwater pearl mussel, and therefore successful recruitment, is reliant on the integrity of the salmon population (Taeubert and Geist, 2017). However, as ecological connectivity between the CFIIS development site and the Atlantic salmon population associated with the River Moriston SAC is considered unlikely (see above), no ecological connectivity between the CFIIS development site and the freshwater pearl mussel population associated with the SAC is anticipated.

7.12 Rum SPA

The Rum SPA includes the Inner Hebridean Island of Rum, which has a largely rocky coast with cliffs rising to 210m, and adjacent coastal waters. There are a few exposed beaches and a more sheltered shingle and boulder beach with intertidal mudflats in the inlet of Loch Scresort. Sub-maritime grasslands and heaths are widely distributed along the coast, notably on cliff tops and above exposed beaches on the west coast. The interior consists almost entirely of mountain and moorland with numerous streams and small lochs. Vestigial saltmarsh is restricted to small areas on gravelly silt deposits and there is a small sand-dune system backed by machair grading into alluvial marsh on the flood plain of the Kilmory River. The island is largely treeless with fragments of natural woodland and scrub only in a few rocky gullies, though there are additional areas of planted woodland (NatureScot, 2020b).

The boundary of the SPA overlaps with Rum SSSI and the seaward extension extends approximately 4km into the marine environment to include the seabed, water column and surface. Immediately offshore of Rum the sediments are a mixture of mud and sand with water depth generally less than 40m, although round much of the island this increases rapidly up to 80m. Maximum tidal currents generally vary between 0.5 and 1.0 metres/second (m/s) (NatureScot, 2020b).

A number of fish species spawn off the north-west coast of Scotland with the seas around the Small Isles particularly important as nursery areas for saithe and cod. Many of these species will form the food resource for marine waterbirds (NatureScot, 2020b).

The Rum SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting a population of European importance of Annex 1 species, including red-throated diver and golden eagle (NatureScot, 2020b).

The Rum SPA also qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of a migratory species, Manx shearwater (NatureScot, 2020b).

The Rum SPA further qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. The SPA regularly supports 130,000 seabirds, including nationally important populations of black-legged kittiwake, common guillemot and Manx shearwater (NatureScot, 2020b).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Rum SPA determined that there was unlikely to be ecological connectivity for golden eagle, common guillemot, and red-throated diver (Table 7.12.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of black-legged kittiwake, and Manx shearwater, and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.12.1). As such, black-legged kittiwake, Manx shearwater, and the breeding seabird assemblage, as qualifying interests of the Rum SPA, were taken forward for screening for LSE (Table 7.12.1). It was assessed that there was LSE for black-legged kittiwake and the breeding seabird assemblage associated with the Rum SPA, which were then taken forward to the assessment of adverse effects (Section 8.5: Rum SPA). No LSE was identified for Manx shearwater or the breeding seabird assemblage associated with the Rum SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.12.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Rum SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding golden eagle	No	The core foraging range of golden eagle from its nest site is 6km, with a maximum range of up to 9km (SNH, 2016) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 60km away from the Rum SPA). Furthermore, there are known records of golden eagle within 9km of the CFIIS site (Duncan, 2024). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of golden eagle associated with the Rum SPA.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 60km away from the Rum SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). However, common guillemot are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, common guillemot would need to travel approximately 108km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging range of common guillemot and there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Rum SPA.
Breeding black-legged kittiwake	Yes	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 60km away from the Rum SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 108km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be within the mean maximum foraging range of black-legged kittiwake and hence, there is potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the Rum SPA. Black-legged kittiwake have been observed on numerous occasions within 2km of the CFIIS site and hence there is LSE for black-legged kittiwake associated with the Rum SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Manx shearwater	Yes	The mean maximum foraging range of Manx shearwater has been calculated at 2365.5km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 60km away from the Rum SPA). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Manx shearwater associated with the Rum SPA. Manx shearwater are a pelagic seabird, which migrate to South America in late-summer to overwinter, usually returning the waters around the UK in early spring to breed (RSPB, 2024a). As such, they would not be expected to be around the CFIIS development site during the non-breeding season. the UK supports over 93% of the breeding population of Manx shearwater, mostly on the west coast (Mitchell *et al.*, 2004). It has been shown that during the chick-rearing stage of the breeding season they forage over continental waters, especially the highly stratified Irish Sea, where its high productivity is thought to draw them in (Scottish Government, 2022). On Rum the average distance from the colony that a chick-rearing adult would forage was 35km, which is outwith the distance to the CFIIS site. Furthermore, there have been no observations of Manx shearwater within 2km of the CFIIS (NBN, 2025). As such, there is no LSE for Manx shearwater associated with the Rum SPA.
Breeding red-throated diver	No	The maximum and mean maximum foraging range of red-throated diver has been calculated at 9km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 60km away from the Rum SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of red-throated diver associated with the Rum SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Rum SPA includes common guillemot, black-legged kittiwake, and Manx shearwater. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot associated with the Rum SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of black-legged kittiwake and Manx shearwater associated with the Rum SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site and the breeding seabird assemblage associated with the Rum SPA. There is LSE for black-legged kittiwake, which are within the breeding seabird assemblage for the Rum SPA. As there is LSE for one or more of the qualifying interests of the breeding seabird assemblage, there is also LSE for the breeding seabird assemblage at the Rum SPA.

7.13 Rum SAC

The Rum SAC overlaps with the Rum SSSI and the Rum SPA, encompassing the entire island of Rum. The Island of Rum, which has a largely rocky coast with cliffs rising to 210m, and adjacent coastal waters. There are a few exposed beaches and a more sheltered shingle and boulder beach with intertidal mudflats in the inlet of Loch Scresort. Sub-maritime grasslands and heaths are widely distributed along the coast, notably on cliff tops and above exposed beaches on the west coast. The interior consists almost entirely of mountain and moorland with numerous streams and small lochs. Vestigial saltmarsh is restricted to small areas on gravelly silt deposits and there is a small sand-dune system backed by machair grading into alluvial marsh on the flood plain of the Kilmory River. The island is largely treeless with fragments of natural woodland and scrub only in a few rocky gullies, though there are additional areas of planted woodland (NatureScot, 2020b; NatureScot, 2020g).

No potential ecological connectivity was identified between the CFIIS development site and the qualifying interests of the Rum SAC (Table 7.13.1). As such, none of the qualifying interests of the SAC will be taken forward for assessment for LSE, and the Rum SAC will not be considered further.

Table 7.13.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Canna and Sanday SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Acid peat-stained lakes and ponds	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥63.1km away (i.e. the distance between the Rum SAC and the CFIIS development site).
Acidic scree	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥63.1km away (i.e. the distance between the Rum SAC and the CFIIS development site).
Alpine and subalpine heaths	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥63.1km away (i.e. the distance between the Rum SAC and the CFIIS development site).
Base-rich fens	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥63.1km away (i.e. the distance between the Rum SAC and the CFIIS development site).
Base-rich scree	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥63.1km away (i.e. the distance between the Rum SAC and the CFIIS development site).
Blanket bog	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥63.1km away (i.e. the distance between the Rum SAC and the CFIIS development site).
Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥63.1km away (i.e. the distance between the Rum SAC and the CFIIS development site).

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Depressions on peat substrates	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥63.1km away (i.e. the distance between the Rum SAC and the CFIIS development site).
Dry heaths	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥63.1km away (i.e. the distance between the Rum SAC and the CFIIS development site).
Grasslands on soils rich in heavy metals	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥63.1km away (i.e. the distance between the Rum SAC and the CFIIS development site).
Otter	No	The closest boundary of the SAC estimates a distance of 63.1km to the CFIIS development site which is six times the expected marine foraging limits of the species (Chanin, 2013). Due to the location of the SAC relative to the CFIIS development site it is unlikely that there would be potential ecological connectivity. Furthermore, it would take a journey of 22.4km by the marine environment from the closest Rum SAC boundary, relative to the dredge site, to the closest dredge disposal site of Armadale (HE070) which would not be feasible for the species. Due to these distances, it is not considered to have potential ecological connectivity.
Plants in crevices on acid rocks	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥63.1km away (i.e. the distance between the Rum SAC and the CFIIS development site).
Plants in crevices on base-rich rocks	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥63.1km away (i.e. the distance between the Rum SAC and the CFIIS development site).
Species-rich grassland with mat-grass in upland areas	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥63.1km away (i.e. the distance between the Rum SAC and the CFIIS development site).

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Tall herb communities	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥63.1km away (i.e. the distance between the Rum SAC and the CFIIS development site).
Wet heathland with cross-leaved heath	No	Any terrestrial habitat loss or degradation associated with the CFIIS is expected to be localised to the development site. As such, no ecological connectivity would be expected to terrestrial habitats situated ≥63.1km away (i.e. the distance between the Rum SAC and the CFIIS development site).

7.14 Canna and Sanday SPA

The Canna and Sanday SPA incorporates the island of Canna, the most western of the Small Isles in the Inner Hebrides. The SPA also includes part of the smaller island of Sanday, which is connected to Canna at low tide. The coastline of Canna consists mainly of steep cliffs capped by a ridge of wet heath and blanket bog. Sanday and the more low-lying areas of Canna support a varied range of coastal grassland and heath communities (SNH, 2009d).

The boundary of the SPA overlaps with the boundary of Canna and Sanday SSSI, and the seaward extension extends approximately 1km into the marine environment to include the seabed, water column and surface (SNH, 2009d).

The Canna and Sanday SPA qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. The SPA regularly supports 21,000 seabirds, including nationally important populations of European shag, herring gull, black-legged kittiwake, common guillemot and Atlantic puffin (SNH, 2009d).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Canna and Sanday SPA determined that there was unlikely to be ecological connectivity for common guillemot and European shag (Table 7.14.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of herring gull, black-legged kittiwake, Atlantic puffin, and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.14.1). As such, herring gull, black-legged kittiwake, Atlantic puffin, and the breeding seabird assemblage, as qualifying interests of the Canna and Sanday SPA, were taken forward for screening for LSE (Table 7.14.1). It was assessed that there was LSE for black-legged kittiwake, the breeding seabird assemblage and herring gull associated with the Canna and Sanday SPA, which were then taken forward to the assessment of adverse effects (Section 8.6: Canna and Sanday SPA). No LSE was identified for Atlantic puffin associated with the Canna and Sanday SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.14.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Canna and Sanday SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 81km away from the Canna and Sanday SPA). However, common guillemot are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, common guillemot would need to travel approximately 120km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to common guillemot outwith the mean maximum foraging distance for common guillemot and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Canna and Sanday SPA.
Breeding herring gull	Yes	The mean maximum foraging range of herring gull has been calculated at 85.6km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 81km away from the Outer Firth of Forth and Canna and Sanday SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site from NBN and breeding bird surveys conducted in 2022 (NBN, 2025; Atmos Consulting, 2022). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of herring gull associated with the Canna and Sanday SPA. Herring gull are well established in the area of the CFIIS and hence there is LSE on the population of herring gull associated with the Canna and Sanday SPA.
Breeding black-legged kittiwake	Yes	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 81km away from the Canna and Sanday SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 120km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be within the mean maximum foraging distance for black-legged kittiwake and hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the Canna and Sanday SPA. Black-legged kittiwake have been observed on numerous occasions within 2km of the CFIIS site (NBN, 2025) and hence there is LSE for black-legged kittiwake associated with the Canna and Sanday SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Atlantic puffin	Yes	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 81km away from the Canna and Sanday SPA). However, Atlantic puffin are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Atlantic puffin would need to travel approximately 120km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be within the mean maximum foraging distance for Atlantic puffin and hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Atlantic puffin associated with the Canna and Sanday SPA. Atlantic puffin are a migratory seabird which nests in burrows on the east and west coast of the UK, including the Northern Isles. Individuals tend to spend the winter on the open ocean with many staying in British waters, however some travel as far south as the Mediterranean and west Africa (British Trust for Ornithology (BTO), 2025e). As such, Atlantic puffin would not be expected to be in the vicinity of the CFIIS site during the non-breeding season. The species is more densely populated around areas with large colonies including the Western and Northern Isles and islands associated with the Firth of Forth (Scottish Government, 2023). The most important area identified for Atlantic puffin during the breeding season is the waters of the Outer Firth of Forth, with waters east and west of Harris important but to a lesser degree (Kober, 2012). A study on individuals associated with the Isle of May on the east coast of Scotland showed that foraging trips during the breeding season were either longer overnight trips of 38-66km or shorter trips at 9-17km from the colony (Harris *et al.,* 2012). This highlights that the species will usually forage at a smaller distance than its mean maximum foraging distance. Hence, as Atlantic puffin have not been recorded within 2km of the CFIIS, there is no LSE on Atlantic puffin associated with the Canna and Sanday SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Canna and Sanday SPA includes common guillemot, herring gull, black-legged kittiwake, and Atlantic puffin. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot associated with the Canna and Sanday SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of black-legged kittiwake, herring gull and Atlantic puffin associated with the Canna and Sanday SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Canna and Sanday SPA. There is LSE for black-legged kittiwake and herring gull, which are within the breeding seabird assemblage for the Canna and Sanday SPA. As there is LSE for one or more of the qualifying interests of the breeding seabird assemblage, there is also LSE for the breeding seabird assemblage at the Canna and Sanday SPA.
Breeding European shag	No	The mean maximum foraging range of European shag has been calculated at 23.7km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 81km away from the Canna and Sanday SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of European shag associated with the Canna and Sanday SPA.

7.15 Shiant Isles SPA

The Shiant Isles SPA is comprised of four islands, with their skerries, which are situated in The Minch, 6km east of Harris in the Western Isles of Scotland (SNH, 2009t).

The boundary of the SPA overlaps with the boundary of Shiant Islands SSSI, and the seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009t).

The Shiant Isles SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting a population of European importance of an Annex 1 species, Greenland barnacle goose (SNH, 2009t).

The Shiant Isles SPA further qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of migratory species, including European shag, razorbill, and Atlantic puffin (SNH, 2009t).

The Shiant Isles SPA also qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. The site regularly supports 200,000 seabirds including nationally important populations of Northern fulmar, common guillemot and black-legged kittiwake (SNH, 2009t).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Shiant Isles SPA determined that there was unlikely to be ecological connectivity for Greenland barnacle goose, common guillemot, razorbill, and European Shag (Table 7.16.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar, black-legged kittiwake, Atlantic puffin, and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.16.1). As such, Northern fulmar, black-legged kittiwake, Atlantic puffin, and the breeding seabird assemblage, as qualifying interests of the Shiant Isles SPA, are taken forward for screening for LSE (Table 7.16.1). It was assessed that there was LSE for black-legged kittiwake associated with the Shiant Isles SPA, which were then taken forward to the assessment of adverse effects (Section 8.7: Shiant Isles SPA). No LSE was identified for Northern fulmar and Atlantic puffin associated with the Shiant Isles SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.15.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Shiant Isles SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 142km away from the Shiant Isles SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern fulmar associated with the Shiant Isles SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, there is no LSE for Northern fulmar associated with the Shiant Isles SPA.
Non-breeding Greenland barnacle goose	No	The core winter foraging range from a night roost of Greenland barnacle goose is 15km, with a maximum recorded distance of 25km (SNH, 2016) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 142km away from the Shiant Isles SPA). Hence there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of Greenland barnacle goose associated with the Shiant Isles SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 142km away from the Shiant Isles SPA). Hence there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Shiant Isles SPA.
Breeding black-legged kittiwake	Yes	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 142km away from the Shiant Isles SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the Shiant Isles SPA. Black-legged kittiwake have been observed on numerous occasions within 2km of the CFIIS site and hence there is LSE for black-legged kittiwake associated with the Shiant Isles SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Atlantic puffin	Yes	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 142km away from the Shiant Isles SPA). However, Atlantic puffin are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Atlantic puffin would need to travel approximately 240km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be within the mean maximum foraging distance for Atlantic puffin and hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Atlantic puffin associated with the Shiant Isles SPA. Atlantic puffin are a migratory seabird which nests in burrows on the east and west coast of the UK, including the Northern Isles. Individuals tend to spend the winter on the open ocean with many staying in British waters, however some travel as far south as the Mediterranean and west Africa (BTO, 2025e). As such, Atlantic puffin would not be expected to be in the vicinity of the CFIIS site during the non-breeding season. The species is more densely populated around areas with large colonies including the Western and Northern Isles and islands associated with the Firth of Forth (Scottish Government, 2023). The most important area identified for Atlantic puffin during the breeding season is the waters of the Outer Firth of Forth, with waters east and west of Harris important but to a lesser degree (Kober, 2012). A study on individuals associated with the Isle of May on the east coast of Scotland showed that foraging trips during the breeding season were either longer overnight trips of 38-66km or shorter trips at 9-17km from the colony (Harris *et al.,* 2012). This highlights that the species will usually forage at a smaller distance than its mean maximum foraging distance. Hence, as Atlantic puffin have not been recorded within 2km of the CFIIS, there is not LSE for Atlantic Puffin associated with the Shiant Isles SPA.
Breeding razorbill	No	The mean maximum foraging range of razorbill has been calculated at 122.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 142km away from the Shiant Isles SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of razorbill associated with the Shiant Isles SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Shiant Isles SPA includes Northern fulmar, common guillemot, and black-legged kittiwake. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot associated with the Shiant Isles SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of black-legged kittiwake and Northern fulmar associated with the Shiant Isles SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Shiant Isles SPA. There is LSE for black-legged kittiwake and herring gull, which are within the breeding seabird assemblage for the Shiant Isles SPA. As there is LSE for one or more of the qualifying interests of the breeding seabird assemblage, there is also LSE for the breeding seabird assemblage at the Shiant Isles SPA.
Breeding European shag	No	The mean maximum foraging range of European shag has been calculated at 23.7km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 142km away from the Shiant Isles SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of European shag associated with the Shiant Isles SPA.

7.16 Forth Islands SPA

The Forth Islands SPA consists of a series of islands, which support the main seabird colonies in the Firth of Forth. The islands of Inchmickery, Isle of May, Fidra, The Lamb, Craigleith and Bass Rock were classified on 25th April 1990. The extension to the site, classified on 16th February 2004 consists of the island of Long Craig, which, at the time of classification, supported the largest colony of roseate tern in Scotland. It is the most northerly of only six regular British colonies. The seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2018a).

The boundary of the SPA overlaps with the boundaries of Long Craig SSSI, Inchmickery SSSI, Forth Islands SSSI, Bass Rock SSSI and the Isle of May SSSI. A small overlap also occurs with the Firth of Forth SPA (SNH, 2018a).

The Forth Islands SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting populations of European importance of Annex 1 species, including Arctic tern, roseate tern, common tern, and sandwich tern (SNH, 2018a).

The Forth Islands SPA further qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of migratory species, including Northern gannet, European shag, lesser black-backed gull and Atlantic puffin (SNH, 2018a).

The Forth Islands SPA also qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. The site regularly supports 90,000 seabirds (three year mean, 1986 – 1988) including nationally important populations of razorbill, common guillemot, black-legged kittiwake, herring gull, great cormorant, northern gannet, lesser black-backed gull, European shag, Atlantic puffin, Arctic tern, common tern, roseate tern, and sandwich tern (SNH, 2018a).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Forth Islands SPA determined that there was unlikely to be ecological connectivity for Arctic tern, common tern, great cormorant, northern gannet, common guillemot, herring gull, black-legged kittiwake, lesser black-backed gull, Atlantic puffin, razorbill, roseate tern, sandwich tern, European shag, and subsequently, the breeding seabird assemblage (Table 7.16.1). As such, none of the qualifying interests of the SPA, are being taken forward for screening for LSE and the Forth Islands SPA will not be considered further.

Table 7.16.1: Assessment for Potential Ecological Connectivity of the Qualifying Interests Associated with the Forth Islands SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Arctic tern	No	The mean maximum foraging range of Arctic tern has been calculated at 40.5km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 138km away from the Forth Islands SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of Arctic tern associated with the Forth Islands SPA.
Breeding common tern	No	The mean maximum foraging range of common tern has been recorded at 26.9km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 138km away from the Forth Islands SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common tern associated with the Forth Islands SPA.
Breeding great cormorant	No	The mean maximum foraging range of great cormorant has been calculated at 33.9km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 138km away from the Forth Islands SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of great cormorant associated with the Forth Islands SPA.
Breeding Northern gannet	No	The maximum foraging range of Northern gannet has been calculated at 590km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 138km away from the Forth Islands SPA). However, Northern gannet are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Northern gannet would need to travel approximately 748km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the maximum foraging distance for Northern gannet and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern gannet associated with the Forth Islands SPA.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 138km away from the Forth Islands SPA). Hence there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Forth Islands SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding herring gull	No	The mean maximum foraging range of herring gull has been calculated at 85.6km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 138km away from the Forth Islands SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of herring gull associated with the Forth Islands SPA.
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 138km away from the Forth Islands SPA). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 748km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for black-legged kittiwake and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the Forth Islands SPA.
Breeding lesser black-backed gull	No	The mean maximum foraging range of lesser black-backed gull has been calculated at 236km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 138km away from the Forth Islands SPA). However, lesser black-backed gull are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, lesser black-backed gull would need to travel approximately 748km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for lesser black-backed gull and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of lesser black-backed gull associated with the Forth Islands SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Atlantic puffin	No	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 138km away from the Forth Islands SPA). However, Atlantic puffin are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Atlantic puffin would need to travel approximately 748km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for Atlantic puffin and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of Atlantic puffin associated with the Forth Islands SPA. Atlantic puffin are a migratory seabird which nests in burrows on the east and west coast of the UK, including the Northern Isles. Individuals tend to spend the winter on the open ocean with many staying in British waters, however some travel as far south as the Mediterranean and west Africa (BTO, 2025e). As such, Atlantic puffin would not be expected to be in the vicinity of the CFIIS site during the non-breeding season. The species is more densely populated around areas with large colonies including the Western and Northern Isles and islands associated with the Firth of Forth (Scottish Government, 2023). The most important area identified for Atlantic puffin during the breeding season is the waters of the Outer Firth of Forth, with waters east and west of Harris important but to a lesser degree (Kober, 2012). A study on individuals associated with the Isle of May on the east coast of Scotland showed that foraging trips during the breeding season were either longer overnight trips of 38-66km or shorter trips at 9-17km from the colony (Harris *et al.,* 2012). This highlights that the species will usually forage at a smaller distance than its mean maximum foraging distance. Hence, as Atlantic puffin have not been recorded within 2km of the CFIIS, they will not be considered for LSE.
Breeding razorbill	No	The mean maximum foraging range of razorbill has been calculated at 122.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 138km away from the Forth Islands SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of razorbill associated with the Forth Islands SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding roseate tern	No	The mean maximum foraging range of roseate tern has been calculated at 23.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 138km away from the Forth Islands SPA. Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of roseate tern associated with the Forth Islands SPA.
Breeding sandwich tern	No	The mean maximum foraging range of sandwich tern has been calculated at 57.5km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 138km away from the Forth Islands SPA. Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of sandwich tern associated with the Forth Islands SPA.
Breeding seabird assemblage	No	The breeding seabird assemblage associated with the Forth Islands SPA includes Arctic tern, common tern, great cormorant, Northern gannet, common guillemot, herring gull, black-legged kittiwake, lesser black-backed gull, Atlantic puffin, razorbill, roseate tern, sandwich tern, and European shag. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of Arctic tern, common tern, great cormorant, Northern gannet, common guillemot, herring gull, black-legged kittiwake, lesser black-backed gull, Atlantic puffin, razorbill, roseate tern, sandwich tern, and European shag associated with the Forth Islands SPA. Therefore, there is no potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Forth Islands SPA.
Breeding European shag	No	The mean maximum foraging range of European shag has been calculated at 23.7km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 138km away from the Forth Islands SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of European shag associated with the Forth Islands SPA.

7.17 Mingulay and Berneray SPA

The Mingulay and Berneray SPA consists of two adjacent islands at the southern end of the Outer Hebrides. They have a maritime/paramaritime vegetation and predominantly cliffed, rocky coastlines (SNH, 2009m).

The boundary of the SPA overlaps with the boundary of Mingulay and Berneray SSSI, and the seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009m).

The Mingulay and Berneray SPA qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of the migratory species, razorbill (SNH, 2009m).

The Mingulay and Berneray SPA also qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. It regularly supports 105,000 seabirds including nationally important populations of Northern fulmar, European shag, black-legged kittiwake, common guillemot, and Atlantic puffin (SNH, 2009m).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Mingulay and Berneray SPA determined that there was unlikely to be ecological connectivity for common guillemot, razorbill, and European shag (Table 7.17.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar, black-legged kittiwake, Atlantic puffin, and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.17.1). As such, Northern fulmar, black-legged kittiwake, Atlantic puffin, and the breeding seabird assemblage, as qualifying interests of the Mingulay and Berneray SPA, are taken forward for screening for LSE (Table 7.17.1). It was assessed that there was LSE for black-legged kittiwake and the seabird assemblage associated with the Mingulay and Berneray SPA, which were then taken forward to the assessment of adverse effects (Section 8.8: Mingulay and Berneray SPA). No LSE was identified for Northern fulmar and Atlantic puffin associated with the Mingulay and Berneray SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.17.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Mingulay and Berneray SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 143km away from the Mingulay and Berneray SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern fulmar associated with the Mingulay and Berneray SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, there is no LSE for Northern fulmar associated with the Mingulay and Berneray SPA.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 143km away from the Mingulay and Berneray SPA). Hence there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Mingulay and Berneray SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding black-legged kittiwake	Yes	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 143km away from the Mingulay and Berneray SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the Mingulay and Berneray SPA. Black-legged kittiwake have been observed on numerous occasions within 2km of the CFIIS site and hence there are LSE anticipated for black-legged kittiwake associated with the Mingulay and Berneray SPA.
Breeding Atlantic puffin	Yes	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 143km away from the Mingulay and Berneray SPA). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Atlantic puffin associated with the Mingulay and Berneray SPA. Atlantic puffin are a migratory seabird which nests in burrows on the east and west coast of the UK, including the Northern Isles. Individuals tend to spend the winter on the open ocean with many staying in British waters, however some travel as far south as the Mediterranean and west Africa (BTO, 2025e). As such, Atlantic puffin would not be expected to be in the vicinity of the CFIIS site during the non-breeding season. The species is more densely populated around areas with large colonies including the Western and Northern Isles and islands associated with the Firth of Forth (Scottish Government, 2023). The most important area identified for Atlantic puffin during the breeding season is the waters of the Outer Firth of Forth, with waters east and west of Harris important but to a lesser degree (Kober, 2012). A study on individuals associated with the Isle of May on the east coast of Scotland showed that foraging trips during the breeding season were either longer overnight trips of 38-66km or shorter trips at 9-17km from the colony (Harris *et al.*, 2012). This highlights that the species will usually forage at a smaller distance than its mean maximum foraging distance. Hence, as Atlantic puffin have not been recorded within 2km of the CFIIS, there is no LSE for Atlantic puffin associated with the Mingulay and Berneray SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding razorbill	No	The mean maximum foraging range of razorbill has been calculated at 122.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 143km away from the Mingulay and Berneray SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of razorbill associated with the Mingulay and Berneray SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Mingulay and Berneray SPA includes Northern fulmar, common guillemot, black-legged kittiwake, Atlantic puffin, razorbill, and European shag. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of European shag, razorbill and common guillemot associated with the Mingulay and Berneray SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of black-legged kittiwake, Northern fulmar and Atlantic puffin associated with the Mingulay and Berneray SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Mingulay and Berneray SPA. There is LSE for black-legged kittiwake, which are within the breeding seabird assemblage for the Mingulay and Berneray SPA. As there is LSE for one or more of the qualifying interests of the breeding seabird assemblage, there is also LSE for the breeding seabird assemblage at the Mingulay and Berneray SPA.
Breeding European shag	No	The mean maximum foraging range of European shag has been calculated at 23.7km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 143km away from the Mingulay and Berneray SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of European shag associated with the Mingulay and Berneray SPA.

7.18 Outer Firth of Forth and St Andrews Bay Complex SPA

The Outer Firth of Forth and St Andrews Bay Complex SPA is a large estuarine/marine site on south-east coast of Scotland consisting of the two closely adjacent Firths of Forth and Tay. In the mid Firth of Forth a belt of mud-rich sediments lies between areas of sandy gravels and shell material on either side along the shore. As the estuary widens towards the outer firth, there are extensive areas of sandy and gravelly muds and fine sediments. In contrast St Andrews Bay contains clean sands and gravel with only small areas of muddy sediments. Water depth is variable but large areas, in both the Firth of Forth and St Andrews Bay, are shallow and less than 10m deep (NatureScot, 2020a).

The area supports a wide variety of both pelagic and demersal fish, including sandeels, and crustaceans, molluscs, and marine worms, all of which, especially sandeels, comprise the prey of the waterfowl species (NatureScot, 2020a).

The Outer Firth of Forth and St Andrews Bay Complex SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting a non-breeding population of European importance of Annex 1 species, including red-throated diver, Slavonian grebe, little gull and feeding common and Arctic tern from the adjacent breeding colonies (NatureScot, 2020a).

The Outer Firth of Forth and St Andrews Bay Complex SPA further qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of a migratory waterfowl species, common eider and by regularly supporting in excess of 20,000 individual waterfowl, including nationally important populations of long-tailed duck, common scoter, velvet scoter, common goldeneye and red-breasted merganser (NatureScot, 2020a).

The Outer Firth of Forth and St Andrews Bay Complex SPA further qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of two migratory species of seabird, including foraging European shag from the nearby colonies, and Northern gannet (NatureScot, 2020a).

The Outer Firth of Forth and St Andrews Bay Complex SPA further qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds during the breeding season, including nationally important populations of Atlantic puffin, black-legged kittiwake, Manx shearwater, common guillemot, and herring gull (NatureScot, 2020a).

The Outer Firth of Forth and St Andrews Bay Complex SPA further qualifies under Article 4.2 by regularly supporting in excess of 20,000 individual seabirds during the non-breeding season including nationally important populations of black-headed gull, common gull, herring gull, common guillemot, European shag, black-legged kittiwake, and razorbill (NatureScot, 2020a).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Outer Firth of Forth and St Andrews Bay Complex SPA determined that there was unlikely to be ecological connectivity for Arctic tern, black-headed gull, common gull, common scoter, common tern, common eider, Northern gannet, common goldeneye, common guillemot (breeding and non-breeding), herring gull (breeding and non-breeding), black-legged kittiwake (breeding and non-breeding), little gull, long-tailed duck, Atlantic puffin, razorbill, red-breasted merganser, red-throated diver, Non-breeding seabird assemblage, European shag (breeding and non-breeding), Slavonian grebe, velvet scoter and waterfowl assemblage (Table 7.18.1). Nonetheless, potential ecological connectivity between the CFIIS development site and the populations of Manx shearwater and

subsequently, the breeding seabird assemblage associated with the SPA (Table 7.18.1). As such, Manx shearwater and the breeding seabird assemblage, as qualifying interests of the Outer Firth of Forth and St Andrews Bay Complex SPA, are taken forward for screening for LSE (Table 7.18.1). No LSE was identified for Manx shearwater and the seabird assemblage associated with the Outer Firth of Forth and St Andrews Bay Complex SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.18.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Outer Firth of Forth and St Andrews Bay Complex SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Arctic tern	No	The mean maximum foraging range of Arctic tern has been calculated at 40.5km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA. Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of Arctic tern associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Non-breeding black-headed gull	No	The maximum and mean maximum foraging range of black-headed gull has been calculated at 18.5km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA. Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of black-headed gull associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Non-breeding common gull	No	The maximum and mean maximum foraging range of common gull has been calculated at 50km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA. Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common gull associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Non-breeding common scoter	No	The foraging range of common scoter is unknown and therefore, a buffer of 15km has been applied to consider connectivity between the species and the CFIIS development site (NatureScot, 2023b) (Table A1.1). Thus, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common scoter associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding common tern	No	The mean maximum foraging range of common tern has been calculated at 26.9km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA. Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common tern associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Non-breeding common eider	No	The mean maximum foraging range of common eider has been calculated at 21.5km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA. Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common eider associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Breeding Northern gannet	No	The mean maximum foraging range of Northern gannet has been calculated at 509.4km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). However, Northern gannet are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Northern gannet would need to travel approximately 713km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for Northern gannet and hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern gannet associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Non-breeding common goldeneye	No	The foraging range of common goldeneye is unknown and therefore, a buffer of 15km has been applied to consider connectivity between the species and the CFIIS development site (NatureScot, 2023b) (Table A1.1). Thus, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common goldeneye associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). Hence there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Non-breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). Hence there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Breeding herring gull	No	The mean maximum foraging range of herring gull has been calculated at 85.6km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of herring gull associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Non-breeding herring gull	No	The mean maximum foraging range of herring gull has been calculated at 85.6km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of herring gull associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 713km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for black-legged kittiwake and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Non-breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 713km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for black-legged kittiwake and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Non-breeding little gull	No	The foraging range of little gull is unknown and therefore, a buffer of 15km has been applied to consider connectivity between the species and the CFIIS development site (NatureScot, 2023b) (Table A1.1). Thus, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of little gull associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Non-breeding long-tailed duck	No	The foraging range of long-tailed duck is unknown and therefore, a buffer of 15km has been applied to consider connectivity between the species and the CFIIS development site (NatureScot, 2023b) (Table A1.1). Thus, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of long-tailed duck associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Breeding Manx shearwater	Yes	The mean maximum foraging range of Manx shearwater has been calculated at 2365.5km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Manx shearwater associated with the Outer Firth of Forth and St Andrews Bay Complex SPA. Manx shearwater are a pelagic seabird, which migrate to South America in late-summer to overwinter, usually returning the waters around the UK in early spring to breed (RSPB, 2024a). As such, they would not be expected to be around the CFIIS development site during the non-breeding season. the UK supports over 93% of the breeding population of Manx shearwater, mostly on the west coast (Mitchell *et al.,* 2004). Very few Manx shearwater breed on the east coast of the UK and those that do would be expected to follow similar foraging patterns to those on the west coast, that is to stay close to their breeding colony (Scottish Government, 2022). It is thus unlikely individuals from here would be seen around the CFIIS during the breeding season. Furthermore, there have been no observations of Manx shearwater within 2km of the CFIIS (NBN, 2025). As such, there is not LSE for Manx shearwater associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Atlantic puffin	No	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). However, Atlantic puffin are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Atlantic puffin would need to travel approximately 713km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for Atlantic puffin and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of Atlantic puffin associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Non-breeding razorbill	No	The mean maximum foraging range of razorbill has been calculated at 122.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of razorbill associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Non-breeding red-breasted merganser	No	The foraging range of red-breasted merganser is unknown and therefore, a buffer of 15km has been applied to consider connectivity between the species and the CFIIS development site (NatureScot, 2023b) (Table A1.1). Thus, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of red-breasted merganser associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Non-breeding red-throated diver	No	The maximum and mean maximum foraging range of red-throated diver has been calculated at 9km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of red-throated diver associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Outer Firth of Forth and St Andrews Bay Complex SPA includes, common guillemot, black-legged kittiwake, Atlantic puffin, herring gull, and Manx shearwater. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot, black-legged kittiwake, Atlantic puffin, and herring gull associated with the Outer Firth of Forth and St Andrews Bay Complex SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Manx shearwater associated with the Outer Firth of Forth and St Andrews Bay Complex SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Outer Firth of Forth and St Andrews Bay Complex SPA. There is not LSE for any qualifying interests which make up the breeding bird assemblage at the Outer Firth of Forth and St Andrews Bay Complex SPA, hence there is not LSE for the breeding bird assemblage at this site.
Non-breeding seabird assemblage	No	The non-breeding seabird assemblage associated with the Outer Firth of Forth and St Andrews Bay Complex SPA includes, common guillemot, black-legged kittiwake, herring gull, common gull, black-headed gull, European shag, and razorbill. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot, black-legged kittiwake, herring gull, common gull, black-headed gull, European shag, and razorbill associated with the Outer Firth of Forth and St Andrews Bay Complex SPA. Therefore, there is no potential for ecological connectivity between the CFIIS development site, and the non-breeding seabird assemblage associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Breeding European shag	No	The mean maximum foraging range of European shag has been calculated at 23.7km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of European shag associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Non-breeding European shag	No	The mean maximum foraging range of European shag has been calculated at 23.7km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of European shag associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Non-breeding Slavonian grebe	No	The foraging range of Slavonian grebe is unknown and therefore, a buffer of 15km has been applied to consider connectivity between the species and the CFIIS development site (NatureScot, 2023b) (Table A1.1). Thus, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of Slavonian grebe associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Non-breeding velvet scoter	No	The foraging range of velvet scoter is unknown and therefore, a buffer of 15km has been applied to consider connectivity between the species and the CFIIS development site (NatureScot, 2023b) (Table A1.1). Thus, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 139km away from the Outer Firth of Forth and St Andrews Bay Complex). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of velvet scoter associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.
Non-breeding waterfowl assemblage	No	The non-breeding waterfowl assemblage in the Outer Firth of Forth and St Andrews Bay Complex SPA includes, long-tailed duck, common scoter, velvet scoter, common goldeneye, and red-breasted merganser. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of long-tailed duck, common scoter, velvet scoter, common goldeneye, and red-breasted merganser associated with the Outer Firth of Forth and St Andrews Bay Complex SPA. Therefore, there is no potential for ecological connectivity between the CFIIS development site, and the non-breeding waterfowl assemblage associated with the Outer Firth of Forth and St Andrews Bay Complex SPA.

7.19 Ailsa Craig SPA

Ailsa Craig SPA is an island rising to 338m, situated in the outer part of the Firth of Clyde. Cliffs up to 100m encircle the island and provide nesting sites for a variety of seabirds and notably one of the largest Northern gannet colonies in the world (SNH, 2009a).

The boundary of Ailsa Craig SPA is coincident with Ailsa Craig SSSI. The seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009a).

The Ailsa Craig SPA qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of migratory species, including Northern gannet and lesser black-backed gull (SNH, 2009a).

The Ailsa Craig SPA also qualifies under Article 4.2 of the Birds Directive regularly supporting in excess of 20,000 individual seabirds. It regularly supports 65,000 seabirds, including nationally important populations of common guillemot, black-legged kittiwake, and herring gull (SNH, 2009a).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Ailsa Craig SPA determined that there was unlikely to be ecological connectivity for common guillemot and herring gull (Table 7.19.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern gannet, black-legged kittiwake, lesser black-backed gull, and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.19.1). As such, Northern gannet, black-legged kittiwake, lesser black-backed gull, and the breeding seabird assemblage, as qualifying interests of the Ailsa Craig SPA, are taken forward for screening for LSE (Table 7.19.1). It was assessed that there was LSE for Northern gannet, black-legged kittiwake, lesser black-backed gull and the breeding seabird assemblage associated with the Ailsa Criag SPA, which were then taken forward to the assessment of adverse effects (Section 8.9: Ailsa Craig SPA).

Table 7.19.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Ailsa Craig SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern gannet	Yes	The mean maximum foraging range of Northern gannet has been calculated at 509.4km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 161km away from the Ailsa Craig SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern gannet associated with the Ailsa Craig SPA. Northern gannet have been recorded within 2km of the CFIIS (NBN, 2025) and hence there is not LSE for Northern gannet associated with the Ailsa Craig SPA.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 161km away from the Ailsa Craig SPA). Hence there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Ailsa Craig SPA.
Breeding herring gull	No	The mean maximum foraging range of herring gull has been calculated at 85.6km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 161km away from the Ailsa Craig SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of herring gull associated with the Ailsa Craig SPA.
Breeding black-legged kittiwake	Yes	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 161km away from the Ailsa Craig SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the Ailsa Craig SPA. Black-legged kittiwake have been observed on numerous occasions within 2km of the CFIIS site (NBN, 2025) and hence there are LSE anticipated for black-legged kittiwake associated with the Ailsa Craig SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding lesser black-backed gull	Yes	The mean maximum foraging range of lesser black-backed gull has been calculated at 236km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 161km away from the Ailsa Craig SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of lesser black-backed gull associated with the Ailsa Craig SPA. Lesser black-backed gull have been recorded within 2km of the CFIIS (NBN, 2025) and hence there is not LSE for lesser black-backed gull associated with the Ailsa Craig SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Ailsa Craig SPA includes, common guillemot, black-legged kittiwake, herring gull. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot and herring gull associated with the Ailsa Craig SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of black-legged kittiwake associated with the Ailsa Craig SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Ailsa Craig SPA. There is LSE for black-legged kittiwake, which are within the breeding seabird assemblage for the Ailsa Craig SPA. As there is LSE for one or more of the qualifying interests of the breeding seabird assemblage, there is also LSE for the breeding seabird assemblage at the Ailsa Craig SPA.

7.20 Handa SPA

The Handa SPA consists of an island surrounded by high sea-cliffs and adjacent coastal waters lying a short distance from the west coast of Sutherland in Scotland. It provides a strategic nesting locality for seabirds that feed in the productive waters of the northern Minch, outside the SPA. Most of the island is vegetated with sub-maritime grasslands and heaths. The SPA's principal ornithological importance is for its breeding seabirds (SNH, 2009j).

The boundary of the SPA overlaps with the boundary of Handa Island SSSI, and the seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009j).

The Handa SPA qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of migratory species, including common guillemot, and razorbill (SNH, 2009j).

The Handa SPA also qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. It regularly supports 200,000 seabirds including nationally important populations of great skua, black-legged kittiwake, Northern fulmar, razorbill and common guillemot (SNH, 2009j).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Handa SPA determined that there was unlikely to be ecological connectivity for common guillemot, black-legged kittiwake, and razorbill (Table 7.20.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar, great skua, black-legged kittiwake and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.20.1). As such, Northern fulmar, great skua, black-legged kittiwake and the breeding seabird assemblage, as qualifying interests of the Handa SPA, are taken forward for screening for LSE (Table 7.20.1). It was assessed that there was LSE for black-legged kittiwake and the breeding seabird assemblage associated with the Handa SPA, which were then taken forward to the assessment of adverse effects (Section 8.10: Handa SPA). No LSE was identified for Northern fulmar and great skua associated with the Handa SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.20.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Handa SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 181km away from the Handa SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern fulmar associated with the Handa SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Handa SPA do not have LSE.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding great skua	Yes	The mean maximum foraging range of great skua has been calculated at 931.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 181km away from the Handa SPA). Furthermore, there is a record of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of great skua associated with the Handa SPA. Great skua are migratory, pelagic and predatory seabirds which hunt small birds, rabbits and will often mob other birds to try to relieve them of any food they have caught (BTO, 2025a). The breeding populations in the north and west of Scotland represent roughly 60% of the global population and are at the southern end of this species geographic range (Wade *et al.,* 2014). Most of this breeding population migrate south to the west coast of Africa where they overwinter, with some individuals from breeding colonies in Norway and Iceland overwintering around British shores (Magnusdottir *et al.,* 2012). As such it is less likely that great skua will be present around the CFIIS site in the non-breeding season. Global Positioning System (GPS) tracking of adult great skua from Shetland and Orkney has shown they tend to forage north and east of the Northern Isles, with smaller foraging ranges occurring when they are incubating or rearing their chick (Fox *et al.,* 2018). This suggests populations of great skua around Scotland limit themselves to the immediate area to their breeding site or use deeper water to forage over, suggesting they would not be found around the CFIIS development. Furthermore, there is only one record of a great skua within 2km of the CFIIS which occurred in 1988, highlighting the rarity of such an observation. As such, great skua associated with Handa SPA do not have LSE.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 181km away from the Handa SPA). Hence there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Handa SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding black-legged kittiwake	Yes	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 181km away from the Handa SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 298km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be within the mean maximum foraging distance for black-legged kittiwake and hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the Handa SPA. Black-legged kittiwake have been observed on numerous occasions within 2km of the CFIIS site (NBN, 2025) and hence there is LSE for black-legged kittiwake associated with the Handa SPA.
Breeding razorbill	No	The mean maximum foraging range of razorbill has been calculated at 122.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 181km away from the Handa SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of razorbill associated with the Handa SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Handa SPA includes, Northern fulmar, great skua, common guillemot, black-legged kittiwake, razorbill. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot, razorbill, and black-legged kittiwake associated with the Handa SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar and great skua associated with the Handa SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Handa SPA. There is LSE for black-legged kittiwake, which are within the breeding seabird assemblage for the Handa SPA. As there is LSE for one or more of the qualifying interests of the breeding seabird assemblage, there is also LSE for the breeding seabird assemblage at the Handa SPA.

7.21 East Caithness Cliffs SPA

The East Caithness Cliffs SPA is of special nature conservation and scientific importance within Britain and the European Community for supporting very large populations of breeding seabirds. It includes most of the sea-cliff areas between Wick and Helmsdale on the north-east coast of the Scottish mainland (SNH, 2017).

The boundary of the SPA overlaps either partly or wholly with the Castle of Old Wick to Craig Hammel SSSI, Craig Hammel to Sgaps Geo SSSI, Dunbeath to Sgaps Geo SSSI, Berriedale Cliffs SSSI, Ousdale Burn SSSI and Helmsdale Coast SSSI. The seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2017).

The East Caithness Cliffs SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting a population of European importance of the Annex 1 species, peregrine (SNH, 2017).

The East Caithness Cliffs SPA further qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of migratory species, including common guillemot, razorbill, herring gull, black-legged kittiwake and European shag (SNH, 2017).

The East Caithness Cliffs SPA also qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. It regularly supports 300,000 individual seabirds including nationally important populations of great black-backed gull, great cormorant, Northern fulmar, razorbill, common guillemot, black-legged kittiwake, herring gull, and European shag (SNH, 2017).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the East Caithness Cliffs SPA determined that there was unlikely to be ecological connectivity for great cormorant, great black-backed gull, common guillemot, herring gull, black-legged kittiwake, peregrine, razorbill, and European shag (Table 7.21.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.21.1). As such, Northern fulmar and the breeding seabird assemblage, as qualifying interests of the East Caithness Cliffs SPA, are taken forward for screening for LSE (Table 7.21.1). No LSE was identified for Northern fulmar and the breeding seabird assemblage associated with the East Caithness Cliffs SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.21.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the East Caithness Cliffs SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding great cormorant	No	The mean maximum foraging range of great cormorant has been calculated at 33.9km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 183km away from the East Caithness Cliffs SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of great cormorant associated with the East Caithness Cliffs SPA.
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 183km away from the East Caithness Cliffs SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern fulmar associated with the East Caithness Cliffs SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, there is no LSE for Northern fulmar associated with the East Caithness Cliffs SPA.
Breeding great black-backed gull	No	The maximum and mean maximum foraging range of great black-backed gull has been calculated at 73km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 183km away from the East Caithness Cliffs SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of great black-backed gull associated with the East Caithness Cliffs SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 183km away from the East Caithness Cliffs SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the East Caithness Cliffs SPA.
Breeding herring gull	No	The mean maximum foraging range of herring gull has been calculated at 85.6km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 183km away from the East Caithness Cliffs SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of herring gull associated with the East Caithness Cliffs SPA.
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 183km away from the East Caithness Cliffs SPA). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 476km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for black-legged kittiwake and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the East Caithness Cliffs SPA.
Breeding peregrine	No	The core foraging range of peregrine is 2km, with a maximum recorded distance in Britain of 18km (SNH, 2016) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 183km away from the East Caithness Cliffs SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of peregrine associated with the East Caithness Cliffs SPA.
Breeding razorbill	No	The mean maximum foraging range of razorbill has been calculated at 122.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 183km away from the East Caithness Cliffs SPA. Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of razorbill associated with the East Caithness Cliffs SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the East Caithness Cliffs SPA includes, great cormorant, Northern fulmar, great black-backed gull, common guillemot herring gull, black-legged kittiwake, razorbill, and European shag. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of great cormorant, great black-backed gull, common guillemot herring gull, black-legged kittiwake, razorbill, and European shag associated with the East Caithness Cliffs SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar associated with the East Caithness Cliffs SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the East Caithness Cliffs SPA. There is not LSE for any qualifying interests which make up the breeding seabird assemblage at the East Caithness Cliffs SPA, hence there is no LSE for the breeding seabird assemblage at this site.
Breeding European shag	No	The mean maximum foraging range of European shag has been calculated at 23.7km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 183km away from the East Caithness Cliffs SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of European shag associated with the East Caithness Cliffs SPA.

7.22 Fowlsheugh SPA

The Fowlsheugh SPA is located 4km south of Stonehaven on the east coast of Aberdeenshire in north-east Scotland. It is a 10.15ha stretch of sheer cliffs, between 30m and 60m high, cut mostly from basalt and conglomerate rocks of Old Red Sandstone age (SNH, 2009i).

The boundary of the SPA overlaps with the boundaries of Fowlsheugh SSSI. The seaward extension extends 2km into the marine environment and includes the seabed, water column and surface (SNH, 2009i).

The Fowlsheugh SPA qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. The colony regularly supports 145,000 seabirds. The colony further qualifies under Article 4.2 by regularly supporting populations of European importance of the migratory species common guillemot, and black-legged kittiwake. The colony also regularly supports nationally important populations of razorbill, Northern fulmar, and herring gull (SNH, 2009i).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Fowlsheugh SPA determined that there was unlikely to be ecological connectivity for common guillemot, herring gull, black-legged kittiwake, and razorbill (Table 7.22.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.22.1). As such, Northern fulmar and the breeding seabird assemblage, as qualifying interests of the Fowlsheugh SPA, are taken forward for screening for LSE (Table 7.22.1). No LSE was identified for Northern fulmar and the breeding seabird assemblage associated with the Fowlsheugh SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.22.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Fowlsheugh SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 185km away from the Fowlsheugh SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern fulmar associated with the Fowlsheugh SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Fowlsheugh SPA do not have LSE.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 185km away from the Fowlsheugh SPA). Hence there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Fowlsheugh SPA.
Breeding herring gull	No	The mean maximum foraging range of herring gull has been calculated at 85.6km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 185km away from the Fowlsheugh SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of herring gull associated with the Fowlsheugh SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 185km away from the Fowlsheugh SPA). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 664km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for black-legged kittiwake and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the Fowlsheugh SPA.
Breeding razorbill	No	The mean maximum foraging range of razorbill has been recorded at 122.2km (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 185km away from the Fowlsheugh SPA. Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of razorbill associated with the Fowlsheugh SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Fowlsheugh SPA includes, Northern fulmar, common guillemot, herring gull, black-legged kittiwake, and razorbill. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot, herring gull, black-legged kittiwake, and razorbill associated with the Fowlsheugh SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar associated with the Fowlsheugh SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Fowlsheugh SPA. There is no LSE for any qualifying interests which make up the breeding seabird assemblage at the Fowlsheugh SPA, hence there is no LSE for the breeding seabird assemblage at this site.

7.23 Troup, Pennan and Lion's Head SPA

The Troup, Pennan and Lion's Heads SPA is a 9km stretch of sea cliffs along the Aberdeenshire coast. The cliffs support large colonies of breeding seabirds (SNH, 2009u).

The boundary of the SPA overlaps with the boundary of Gamrie and Pennan coast SSSI and the seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009u).

The Troup, Pennan and Lion's Heads SPA qualifies under Article 4.2 of the Birds Directive by regularly supporting over 20,000 individual breeding seabirds. In 1995 the site supported about 150,000 individual seabirds of 9 species (SNH, 2009u).

The Troup, Pennan and Lion's Heads SPA qualifies further under Article 4.2 of the Birds Directive by regularly supporting internationally important breeding populations of the migratory species, black-legged kittiwake and common guillemot (SNH, 2009u).

In addition to the species mentioned above, the assemblage of breeding seabirds includes the regularly occurring migratory species Northern fulmar, herring gull, and razorbill (SNH, 2009u).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Troup, Pennan and Lion's Head SPA determined that there was unlikely to be ecological connectivity for common guillemot, herring gull, black-legged kittiwake, and razorbill (Table 7.23.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.23.1). As such, Northern fulmar and the breeding seabird assemblage, as qualifying interests of the Troup, Pennan and Lion's Head SPA, are taken forward for screening for LSE (Table 7.23.1). No LSE was identified for Northern fulmar and the breeding seabird assemblage associated with the Troup, Pennan and Lion's Head SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.23.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Troup, Pennan and Lion's Head SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 204km away from the Troup, Pennan and Lion's Head SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern fulmar associated with the Troup, Pennan and Lion's Head SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Troup, Pennan and Lion's Head SPA do not have LSE.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 204km away from the Troup, Pennan and Lion's Head SPA). Hence there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Troup, Pennan and Lion's Head SPA.
Breeding herring gull	No	The mean maximum foraging range of herring gull has been calculated at 85.6km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 204km away from the Troup, Pennan and Lion's Head SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of herring gull associated with the Troup, Pennan and Lion's Head SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 204km away from the Troup, Pennan and Lion's Head SPA). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 561km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for black-legged kittiwake and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the Troup, Pennan and Lion's Head SPA.
Breeding razorbill	No	The mean maximum foraging range of razorbill has been calculated at 122.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 204km away from the Troup, Pennan and Lion's Head SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of razorbill associated with the Troup, Pennan and Lion's Head SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Troup, Pennan and Lion's Head SPA includes, Northern fulmar, common guillemot, herring gull, black-legged kittiwake, and razorbill. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot herring gull, black-legged kittiwake, and razorbill associated with the Troup, Pennan and Lion's Head SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar associated with the Troup, Pennan and Lion's Head SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Troup, Pennan and Lion's Head SPA. There is no LSE for any qualifying interests which make up the breeding seabird assemblage at the Troup, Pennan and Lion's Head SPA, hence there is no LSE for the breeding seabird assemblage at this site.

7.24 Cape Wrath SPA

The Cape Wrath SPA covers two stretches of Torridonian sandstone and Lewisian gneiss cliff around Cape Wrath headland in north-west Scotland. These cliffs support large colonies of breeding seabirds (SNH, 2009e).

The boundary of the SPA overlaps with the boundary of Cape Wrath SSSI, and the seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009e).

The Cape Wrath SPA qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. It regularly supports 50,000 seabirds including nationally important populations of the following species: black-legged kittiwake, common guillemot, razorbill, Atlantic puffin, and Northern fulmar (SNH, 2009e).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Cape Wrath SPA determined that there was unlikely to be ecological connectivity for common guillemot, Atlantic puffin, black-legged kittiwake, and razorbill (Table 7.24.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.24.1). As such, Northern fulmar and the breeding seabird assemblage, as qualifying interests of the Cape Wrath SPA, are taken forward for screening for LSE (Table 7.24.1). No LSE was identified for Northern fulmar and the breeding seabird assemblage associated with the Cape Wrath SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.24.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Cape Wrath SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 205km away from the Cape Wrath SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern fulmar associated with the Cape Wrath SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar do not have LSE.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 205km away from the Cape Wrath SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Cape Wrath SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 205km away from the Cape Wrath SPA). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 326km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for black-legged kittiwake and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the Cape Wrath SPA.
Breeding Atlantic puffin	No	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 205km away from the Cape Wrath SPA). However, Atlantic puffin are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Atlantic puffin would need to travel approximately 326km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for Atlantic puffin and hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Atlantic puffin associated with the Cape Wrath SPA.
Breeding razorbill	No	The mean maximum foraging range of razorbill has been calculated at 122.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 205km away from the Cape Wrath SPA. Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of razorbill associated with the Cape Wrath SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Cape Wrath SPA includes Northern fulmar, common guillemot, black-legged kittiwake, Atlantic puffin, and razorbill. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot, Atlantic puffin, black-legged kittiwake, and razorbill associated with the Cape Wrath SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar associated with the Cape Wrath SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Cape Wrath SPA. There is no LSE for any qualifying interests which make up the breeding seabird assemblage at the Cape Wrath SPA, hence there is no LSE for the breeding seabird assemblage at this site.

7.25 Seas off St Kilda SPA

The Seas off St Kilda SPA is located in Scottish marine waters situated about 50 km northwest of North Uist in the Western Isles of Scotland. It covers 3,995km^2 of mainly offshore waters and encloses the St Kilda archipelago. The site lies very close to the continental shelf edge, with water depth quickly increasing to the west and to the north of its limits. Like most of the continental shelf edge, the Seas off St Kilda SPA is an area of key nursery grounds of mackerel (*Scomber scombrus*) (JNCC, 2020b).

The Seas off St Kilda SPA qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of international importance of the migratory species Northern gannet with a breeding population of 50,332 birds (JNCC, 2020b).

It also qualifies under Article 4.1 of the Birds Directive by regularly supporting an assemblage of breeding seabirds of 67,372 birds. This includes European storm-petrel, which qualifies as a main component of the breeding seabird assemblage.

It also qualifies under Article 4.2 of the Birds Directive by supporting internationally important populations of Northern fulmar, Northern gannet, common guillemot, and Atlantic puffin qualify as main components of this assemblage (JNCC, 2020b).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Seas off St Kilda SPA determined that there was unlikely to be ecological connectivity for common guillemot (Table 7.25.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar, Northern gannet, Atlantic puffin, European storm-petrel, and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.25.1). As such, Northern fulmar, Northern gannet, Atlantic puffin, European storm-petrel, and the breeding seabird assemblage, as qualifying interests of the Seas off St Kilda SPA, are taken forward for screening for LSE (Table 7.25.1). It was assessed that there was LSE for Northern gannet and the seabird assemblage associated with the Seas off St Kilda SPA, which were then taken forward to the assessment of adverse effects (Section 8.11: Seas off St Kilda SPA). No LSE was identified for Northern fulmar, European storm-petrel and Atlantic puffin associated with the Seas off St Kilda SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.25.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Seas off St Kilda SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 209km away from the Seas off St Kilda SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern fulmar associated with the Seas off St Kilda SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Seas off St Kilda SPA do not have LSE.
Breeding Northern gannet	Yes	The mean maximum foraging range of Northern gannet has been calculated at 509.4km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 209km away from the Seas off St Kilda SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern gannet associated with the Seas off St Kilda SPA. Northern gannet have been recorded within 2km of the CFIIS (NBN, 2025) and hence there is LSE for Northern gannet associated with the Seas off St Kilda SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 209km away from the Seas off St Kilda SPA). Hence there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Seas off St Kilda SPA.
Breeding Atlantic puffin	Yes	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 209km away from the Seas off St Kilda SPA). However, Atlantic puffin are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Atlantic puffin would need to travel approximately 245km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be within the mean maximum foraging distance for Atlantic puffin and hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Atlantic puffin associated with the Seas off St Kilda SPA. Atlantic puffin are a migratory seabird which nests in burrows on the east and west coast of the UK, including the Northern Isles. Individuals tend to spend the winter on the open ocean with many staying in British waters, however some travel as far south as the Mediterranean and west Africa (BTO, 2025e). As such, Atlantic puffin would not be expected to be in the vicinity of the CFIIS site during the non-breeding season. The species is more densely populated around areas with large colonies including the Western and Northern Isles and islands associated with the Firth of Forth (Scottish Government, 2023). The most important area identified for Atlantic puffin during the breeding season is the waters of the Outer Firth of Forth, with waters east and west of Harris important but to a lesser degree (Kober, 2012). A study on individuals associated with the Isle of May on the east coast of Scotland showed that foraging trips during the breeding season were either longer overnight trips of 38-66km or shorter trips at 9-17km from the colony (Harris *et al.,* 2012). This highlights that the species will usually forage at a smaller distance than its mean maximum foraging distance. Hence, as Atlantic puffin have not been recorded within 2km of the CFIIS, therefore there is no LSE for Atlantic puffin associated with the Seas off St Kilda SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Seas off St Kilda SPA includes Northern fulmar, common guillemot, Atlantic puffin, and Northern gannet. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot associated with the Seas off St Kilda SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar, Atlantic puffin, and Northern gannet associated with the Seas off St Kilda SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Seas off St Kilda SPA. There is LSE for Northern Gannet, which are within the breeding seabird assemblage for the Seas off St Kilda SPA. As there is LSE for one or more of the qualifying interests of the breeding seabird assemblage, there is also LSE for the breeding seabird assemblage at the Seas off St Kilda SPA.
Breeding European storm-petrel	Yes	The mean maximum foraging range of European storm-petrel has been calculated at 336km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 245km away from the Seas off St Kilda SPA). However, European storm-petrel are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, European storm-petrel would need to travel approximately 120km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be within the mean maximum foraging distance for European storm-petrel and hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of European storm-petrel associated with the Seas off St Kilda SPA. The European storm-petrel is a very small, extremely pelagic seabird which spends the majority of its life at sea, returning to the UK in summer to breed on offshore islands devoid of mammalian predators (BTO, 2025c). At-sea surveys have shown that European storm-petrel congregate far offshore near the continental shelf edge during the breeding season, with more recordings in the northeast and around the Northern Isles from September to November, but no sightings in Scottish waters between December and April (Scottish Government, 2022). As such, European storm-petrel are not expected to be in the vicinity of the CFIIS site in the non-breeding season. Tracking data suggests that the species may utilise waters over the continental shelf itself, specifically east of Shetland for those which nest there (Bolton, 2021). Regardless, European storm-petrel do not use inshore waters for foraging and have not been observed within 2km of the CFIIS site (NBN, 2025). As such no LSE is considered for European storm-petrel associated with the Seas off St Kilda SPA.

7.26 Buchan Ness to Collieston Coast SPA

The Buchan Ness to Collieston Coast SPA is a stretch of south-east facing cliff in Aberdeenshire, Scotland. The 15km stretch of cliffs, formed of granite, quartzite, and other rocks, runs south of Peterhead, broken only by the sandy beach of Cruden Bay. The varied coastal vegetation on the ledges and the cliff tops includes maritime heath, grassland, and brackish flushes (SNH, 2009b).

The boundary of the SPA follows the boundaries of Bullers of Buchan Coast SSSI and Collieston to Whinnyfold Coast SSSI, and the seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009b).

Buchan Ness to Collieston Coast SPA qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. It regularly supports 95,000 seabirds including nationally important populations of the following species: black-legged kittiwake, common guillemot, herring gull, European shag, and Northern fulmar (SNH, 2009b).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Buchan Ness to Collieston Coast SPA determined that there was unlikely to be ecological connectivity for common guillemot, herring gull, black-legged kittiwake, and European shag (Table 7.26.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.26.1). As such, Northern fulmar and the breeding seabird assemblage, as qualifying interests of the Buchan Ness to Collieston Coast SPA, are taken forward for screening for LSE (Table 7.26.1). No LSE was identified for Northern fulmar and the breeding seabird assemblage associated with the Buchan Ness to Collieston Coast SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.26.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Buchan Ness to Collieston Coast SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 210km away from the Buchan Ness to Collieston Coast SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern fulmar associated with the Buchan Ness to Collieston Coast SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Buchan Ness to Collieston Coast SPA do not have LSE.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 210km away from the Buchan Ness to Collieston Coast SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Buchan Ness to Collieston Coast SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding herring gull	No	The mean maximum foraging range of herring gull has been calculated at 85.6km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 210km away from the Buchan Ness to Collieston Coast SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of herring gull associated with the Buchan Ness to Collieston Coast SPA.
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 210km away from the Buchan Ness to Collieston Coast SPA). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 604km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for black-legged kittiwake and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the Buchan Ness to Collieston Coast SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Buchan Ness to Collieston Coast SPA includes Northern fulmar, common guillemot, herring gull, black-legged kittiwake, and European shag. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot, herring gull, black-legged kittiwake, and European shag associated with the Buchan Ness to Collieston SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar associated with the Buchan Ness to Collieston SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Buchan Ness to Collieston SPA. There is no LSE for any qualifying interests which make up the breeding seabird assemblage at the Buchan Ness to Collieston Coast SPA, hence there is no LSE for the breeding seabird assemblage at this site.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding European shag	No	The mean maximum foraging range of European shag has been calculated at 23.7km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 210km away from the Buchan Ness SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of European shag associated with the site.

7.27 Flannan Isles SPA

The Flannan Isles SPA consists of a group of seven rocky islands, outlying skerries and adjacent coastal waters lying approximately 30km west of Lewis in the Outer Hebrides off the north-west coast of Scotland. The islands provide a strategically placed nesting locality for seabirds, which feed in the rich waters off the Western Isles. The vegetation of the islands is predominantly maritime grassland (SNH, 2009g).

The boundary of the SPA overlaps with the boundary of the Flannan Isles SSSI, and the seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009g).

The Flannan Isles SPA qualify under Article 4.1 of the Birds Directive by regularly supporting populations of European importance of the Annex 1 species: Leach's storm-petrel (SNH, 2009g).

The Flannan Isles SPA further qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. It regularly supports 50,000 seabirds including nationally important populations of the following species: common guillemot, razorbill, Atlantic puffin, Northern fulmar, and black-legged kittiwake (SNH, 2009g).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Flannan Isles SPA determined that there was unlikely to be ecological connectivity for common guillemot, Atlantic puffin, and razorbill (Table 7.27.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar, black-legged kittiwake, Leach's storm-petrel, and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.27.1). As such, Northern fulmar, black-legged kittiwake, Leach's storm-petrel, and the breeding seabird assemblage, as qualifying interests of the Flannan Isles SPA, are taken forward for screening for LSE (Table 7.27.1). It was assessed that there was LSE for black-legged kittiwake within the Flannan Isles SPA, which were then taken forward to the assessment of adverse effects (Section 8.12: Flannan Isles SPA). No LSE was identified for Northern fulmar, Leach's storm-petrel and the seabird assemblage associated with the Flannan Isles SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.27.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Flannan Isles SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 218km away from the Flannan Isles SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern fulmar associated with the Flannan Isles SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Flannan Isles SPA do not have LSE.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 218km away from the Flannan Isles SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Flannan Isles SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding black-legged kittiwake	Yes	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 218km away from the Flannan Isles SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 272km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be within the mean maximum foraging distance for black-legged kittiwake and hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the Flannan Isles SPA. Black-legged kittiwake have been observed on numerous occasions within 2km of the CFIIS site (NBN, 2025) and hence there is LSE for black-legged kittiwake associated with the Flanna Isles SPA.
Breeding Leach's storm-petrel	Yes	The mean foraging range of Leach's storm-petrel has been calculated at 657km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 218km away from the Flannan Isles SPA). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Leach's storm-petrel associated with the Flannan Isles SPA. Leach's storm-petrel is the most marine breeding bird in the UK, with a highly restricted breeding distribution, limited to islands within 70km of the continental shelf (BTO, 2025d). The species is migratory and therefore rarely seen between December and April whereby it returns to the few islands around Scotland where it nests (Scottish Government, 2022). It is therefore unlikely that Leach's storm-petrel would be in the vicinity of the CFIIS development site during the non-breeding season. Data on the marine distribution of this species during the breeding season in St Kilda shows that it travels far offshore to the Rosemary Bank seamount where water depths can be >1,000m. This is corroborated by at-sea surveys which have shown there to be high densities of the species at the continental shelf edge and deep waters to the northwest of Scotland, with a large presence also observed around St Kilda (Scottish Government, 2022). However, there have been no sightings of this species within 2km of the CFIIS site (NBN, 2025). As such there is no LSE for Leach's storm-petrel associated with the Flannan Isles SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Atlantic puffin	No	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 218km away from the Flannan Isles SPA). However, Atlantic puffin are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Atlantic puffin would need to travel approximately 272km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for Atlantic puffin and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of Atlantic puffin associated with the Flannan Isles SPA.
Breeding razorbill	No	The mean maximum foraging range of razorbill has been calculated at 122.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 218km away from the Flannan Isles SPA. Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of razorbill associated with the Flannan Isles SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Flannan Isles SPA includes Northern fulmar, common guillemot, black-legged kittiwake, Atlantic puffin, and razorbill. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot, Atlantic puffin and razorbill associated with the Flannan Isles SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar and black-legged kittiwake associated with the Flannan Isles SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Flannan Isles SPA. There is LSE for black-legged kittiwake which make up part of the bird assemblage at the Flannan Isles SPA, however as they do not make up the majority of the seabird assemblage is no LSE for the breeding bird assemblage at this site.

7.28 North Caithness Cliffs SPA

The North Caithness Cliffs SPA is of special nature conservation and scientific importance within Britain and the European Community for supporting very large populations of breeding seabirds (SNH, 2018b).

The site overlaps either partly or wholly with the Duncansby Head, Stroma, Dunnet Head, Holborn Head, and Red Point Coast SSSIs. The seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2018b).

The North Caithness Cliffs SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting a population of European importance of the Annex 1 species peregrine (SNH, 2018b).

The North Caithness Cliffs SPA further qualifies under Article 4.2 of the Birds Directive by regularly supporting a population of European importance of the migratory species common guillemot (SNH, 2018b).

The North Caithness Cliffs SPA also qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. These include nationally important populations of Northern fulmar, black-legged kittiwake, common guillemot, razorbill, and Atlantic puffin (SNH, 2018b).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the North Caithness Cliffs SPA determined that there was unlikely to be ecological connectivity for common guillemot, Atlantic puffin, black-legged kittiwake, peregrine, and razorbill (Table 7.28.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.28.1). As such, Northern fulmar and the breeding seabird assemblage, as qualifying interests of the North Caithness Cliffs SPA, are taken forward for screening for LSE (Table 7.28.1). No LSE was identified for Northern fulmar and the breeding seabird assemblage associated with the North Caithness Cliffs SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.28.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the North Caithness Cliffs SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 220km away from the North Caithness Cliffs SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern fulmar associated with the North Caithness Cliffs SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the North Caithness Cliffs SPA do not have LSE.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 220km away from the North Caithness Cliffs SPA). Hence there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the North Caithness Cliffs SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 220km away from the North Caithness Cliffs SPA). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 413km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for black-legged kittiwake and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the North Caithness Cliffs SPA.
Breeding peregrine	No	The core foraging range of peregrine is 2km, with a maximum recorded distance in Britain of 18km (SNH, 2016) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 220km away from the North Caithness Cliffs SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of peregrine associated with the North Caithness Cliffs SPA.
Breeding Atlantic puffin	No	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 220km away from the North Caithness Cliffs SPA). However, Atlantic puffin are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Atlantic puffin would need to travel approximately 413km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for Atlantic puffin and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of Atlantic puffin associated with the North Caithness Cliffs SPA.
Breeding razorbill	No	The mean maximum foraging range of razorbill has been calculated at 122.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 220km away from the North Caithness Cliffs SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of razorbill associated with the North Caithness Cliffs SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the North Caithness Cliffs SPA includes Northern fulmar, common guillemot, black-legged kittiwake, Atlantic puffin, and razorbill. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot, black-legged kittiwake, Atlantic puffin, and razorbill associated with the North Caithness Cliffs SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar associated with the North Caithness Cliffs SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the North Caithness Cliffs SPA. There is no LSE for any qualifying interests which make up the breeding seabird assemblage at the North Caithness Cliffs SPA, hence there is no LSE for the breeding seabird assemblage at this site.

7.29 St Kilda SPA

The St Kilda SPA is a group of remote Scottish islands lying in the North Atlantic about 70km west of North Uist in the Outer Hebrides. The islands are steep, with precipitous cliffs reaching 430m on Hirta and 380m on Soay and Boreray. The vegetation is strongly influenced by sea spray and the presence of seabirds and livestock. Inland on Hirta, species-poor acidic grassland and sub-maritime heaths occupy extensive areas. The islands provide a strategic nesting locality for seabirds that feed in the rich waters to the west of Scotland. The total population of seabirds exceeds 600,000 individuals, making this one of the largest concentrations in the North Atlantic and the largest in the UK (SNH, 2009q).

The boundary of the SPA overlaps with the boundary of St. Kilda SSSI, and the seaward extension extends approximately 4km into the marine environment to include the seabed, water column and surface (SNH, 2009q).

The St Kilda SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting populations of European importance of the Annex 1 species including, Leach's storm-petrel and European storm-petrel (SNH, 2009q).

The St Kilda SPA qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of the migratory species including Northern gannet, great skua, and Atlantic puffin (SNH, 2009q). The St Kilda SPA also qualifies under Article 4.2 by regularly supporting in excess of 20,000 individual seabirds. This includes nationally important populations of razorbill, common guillemot, black-legged kittiwake, Manx shearwater, Northern fulmar, great skua, Northern gannet, Leach's storm-petrel, and European storm-petrel (SNH, 2009q).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the St Kilda SPA determined that there was unlikely to be ecological connectivity for common guillemot, Atlantic puffin, and razorbill (Table 7.29.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar, Northern gannet, great skua, black-legged kittiwake, Leach's storm-petrel, Manx shearwater, European storm-petrel, and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.29.1). As such, Northern fulmar, Northern gannet, great skua, black-legged kittiwake, Leach's storm-petrel, Manx shearwater, European storm-petrel, and the breeding seabird assemblage, as qualifying interests of the St Kilda SPA, are taken forward for screening for LSE (Table 7.29.1). It was assessed that there was LSE for black-legged kittiwake and Northern gannet associated with the St Kilda SPA, which were then taken forward to the assessment of adverse effects (Section 8.13: St Kilda SPA). No LSE was identified for Northern fulmar, great skua, Leach's storm-petrel, European storm-petrel, Manx shearwater and the seabird assemblage associated with the St Kilda SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.29.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the St Kilda SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 224km away from the St Kilda SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern fulmar associated with the St Kilda SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the St Kilda SPA do not have LSE.
Breeding Northern gannet	Yes	The maximum foraging range of Northern gannet has been calculated at 709km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 224km away from the St Kilda SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern gannet associated with the St Kilda SPA. Northern gannet have been recorded within 2km of the CFIIS (NBN, 2025) and hence there is LSE for Northern gannet associated with the St Kilda SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding great skua	Yes	The mean maximum foraging range of great skua has been calculated at 931.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 224km away from the St Kilda SPA). Furthermore, there is a record of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of great skua associated with the St Kilda SPA. Great skua are migratory, pelagic and predatory seabirds which hunt small birds, rabbits and will often mob other birds to try to relieve them of any food they have caught (BTO, 2025a). The breeding populations in the north and west of Scotland represent roughly 60% of the global population and are at the southern end of this species geographic range (Wade *et al.,* 2014). Most of this breeding population migrate south to the west coast of Africa where they overwinter, with some individuals from breeding colonies in Norway and Iceland overwintering around British shores (Magnusdottir *et al.,* 2012). As such it is less likely that great skua will be present around the CFIIS site in the non-breeding season. GPS tracking of adult great skua from Shetland and Orkney has shown they tend to forage north and east of the Northern Isles, with smaller foraging ranges occurring when they are incubating or rearing their chick (Fox *et al.,* 2018). This suggests populations of great skua around Scotland limit themselves to the immediate area to their breeding site or use deeper water to forage over, suggesting they would not be found around the CFIIS development. Furthermore, there is only one record of a great skua within 2km of the CFIIS which occurred in 1988, highlighting the rarity of such an observation. As such, great skua associated with the St Kilda SPA do not have LSE.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 224km away from the St Kilda SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the St Kilda SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding black-legged kittiwake	Yes	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 224km away from the St Kilda SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 288km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be still within the mean maximum foraging range of black-legged kittiwake and hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the St Kilda SPA. Black-legged kittiwake have been observed on numerous occasions within 2km of the CFIIS site (NBN, 2025) and hence there is LSE for black-legged kittiwake associated with the St Kilda SPA.
Breeding Leach's storm-petrel	Yes	The mean foraging range of Leach's storm-petrel has been calculated at 657km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 224km away from the St Kilda SPA). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Leach's storm-petrel associated with the St Kilda SPA. Leach's storm-petrel is the most marine breeding bird in the UK, with a highly restricted breeding distribution, limited to islands within 70km of the continental shelf (BTO, 2025d). The species is migratory and therefore rarely seen between December and April whereby it returns to the few islands around Scotland where it nests (Scottish Government, 2022). It is therefore unlikely that Leach's storm-petrel would be in the vicinity of the CFIIS development site during the non-breeding season. Data on the marine distribution of this species during the breeding season in St Kilda shows that it travels far offshore to the Rosemary Bank seamount where water depths can be >1,000m. This is corroborated by at-sea surveys which have shown there to be high densities of the species at the continental shelf edge and deep waters to the northwest of Scotland, with a large presence also observed around St Kilda (Scottish Government, 2022). However, there have been no sightings of this species within 2km of the CFIIS site (NBN, 2025). As such there is no LSE for Leach's storm-petrel associated with the St Kilda SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Manx shearwater	Yes	The mean maximum foraging range of Manx shearwater has been calculated at 2365.5km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 224km away from the St Kilda SPA). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Manx shearwater associated with the St Kilda SPA. Manx shearwater are a pelagic seabird, which migrate to South America in late-summer to overwinter, usually returning the waters around the UK in early spring to breed (RSPB, 2024a). As such, they would not be expected to be around the CFIIS development site during the non-breeding season. the UK supports over 93% of the breeding population of Manx shearwater, mostly on the west coast (Mitchell *et al.,* 2004). It has been shown that during the chick-rearing stage of the breeding season they forage over continental waters, especially the highly stratified Irish Sea, where its high productivity is thought to draw them in (Scottish Government, 2022). Furthermore, there have been no observations of Manx shearwater within 2km of the CFIIS (NBN, 2025). As such, there is no LSE for Manx shearwater associated with the St Kilda SPA.
Breeding Atlantic puffin	No	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 224km away from the St Kilda SPA). However, Atlantic puffin are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Atlantic puffin would need to travel approximately 288km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging range of Atlantic puffin and, hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of Atlantic puffin associated with the St Kilda SPA.
Breeding razorbill	No	The mean maximum foraging range of razorbill has been calculated at 122.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 224km away from the St Kilda SPA. Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of razorbill associated with the St Kilda SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the St Kilda SPA includes razorbill, common guillemot, black-legged kittiwake, Manx shearwater, Northern fulmar, Atlantic puffin, great skua, Northern gannet, Leach's storm-petrel, and European storm-petrel. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot, Atlantic puffin and razorbill associated with the St Kilda SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of black-legged kittiwake, Manx shearwater, Northern fulmar, great skua, Northern gannet, Leach's storm-petrel, and European storm-petrel associated with the St Kilda SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the St Kilda SPA. There is LSE for black-legged kittiwake and Northern gannet which make up part of the bird assemblage at the St Kilda SPA, however they do not make up the majority of the assemblage hence, there is no LSE for the breeding bird assemblage at this site.
Breeding European storm-petrel	Yes	The mean maximum foraging range of European storm-petrel has been calculated at 336km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 224km away from the St Kilda SPA). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of European storm-petrel associated with the St Kilda SPA. The European storm-petrel is a very small, extremely pelagic seabird which spends the majority of its life at sea, returning to the UK in summer to breed on offshore islands devoid of mammalian predators (BTO, 2025c). At-sea surveys have shown that European storm-petrel congregate far offshore near the continental shelf edge during the breeding season, with more recordings in the northeast and around the Northern Isles from September to November, but no sightings in Scottish waters between December and April (Scottish Government, 2022). As such, European storm-petrel are not expected to be in the vicinity of the CFIIS site in the non-breeding season. Tracking data suggests that the species may utilise waters over the continental shelf itself, specifically east of Shetland for those which nest there (Bolton, 2021). Regardless, European storm-petrel do not use inshore waters for foraging and have not been observed within 2km of the CFIIS site (NBN, 2025). As such there is no LSE for European storm-petrel associated with the St Kilda SPA.

7.30 Hoy SPA

The Hoy SPA is a located on the northern and western two-thirds of Hoy Island, a mountainous island at the south-western end of the Orkney archipelago. The island is formed of Old Red Sandstone and contains Orkney's highest hills, adjacent to which, are coastal waters. The SPA supports an extremely diverse mixture of mire, heath and alpine vegetation and Britain's most northerly native woodland. These upland areas and the high sea cliffs at the coast support an important assemblage of moorland breeding birds and breeding seabirds (SNH, 2009l).

The boundary of the SPA overlaps with that of the Hoy SSSI, and the seaward extension extends approximately 2 km into the marine environment to include the seabed, water column and surface (SNH, 2009l).

The Hoy SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting populations of European importance of the Annex 1 species, including red-throated diver and peregrine (SNH, 2009l).

The Hoy SPA further qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of the migratory great skua (SNH, 2009l).

The Hoy SPA also qualifies under Article 4.2 of the Birds directive by regularly supporting in excess of 20,000 individual seabirds. It regularly supports 120,000 seabirds including nationally important populations of Atlantic puffin, black-legged kittiwake, Arctic skua, Northern fulmar, great black-backed gull, and common guillemot (SNH, 2009l).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Hoy SPA determined that there was unlikely to be ecological connectivity for common guillemot, black-legged kittiwake, red-throated diver, Arctic skua, great black-backed gull, Atlantic puffin, and razorbill (Table 7.30.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of great skua, Northern fulmar, and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.30.1). As such, great skua, Northern fulmar, and the breeding seabird assemblage, as qualifying interests of the Hoy SPA, are taken forward for screening for LSE (Table 7.30.1). No LSE was identified for Northern fulmar, great skua and the breeding seabird assemblage associated with the Hoy SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.30.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Hoy SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Arctic skua	No	The mean foraging range of Arctic skua has been calculated at 2.7km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 253km away from the Hoy SPA. Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of Arctic skua associated with the Hoy SPA.
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 253km away from the Hoy SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of Northern fulmar associated with the Hoy SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Hoy SPA do not have LSE.
Breeding great black-backed gull	No	The maximum and mean maximum foraging range of great black-backed gull has been calculated at 73km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 253km away from the Hoy SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of great black-backed gull associated with the Hoy SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding great skua	Yes	The mean maximum foraging range of great skua has been calculated at 931.2km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 253km away from the Hoy SPA). Furthermore, there is a record of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the CFIIS development site and the population of great skua associated with the Hoy SPA. Great skua are migratory, pelagic and predatory seabirds which hunt small birds, rabbits and will often mob other birds to try to relieve them of any food they have caught (BTO, 2025a). The breeding populations in the north and west of Scotland represent roughly 60% of the global population and are at the southern end of this species geographic range (Wade *et al.,* 2014). Most of this breeding population migrate south to the west coast of Africa where they overwinter, with some individuals from breeding colonies in Norway and Iceland overwintering around British shores (Magnusdottir *et al.,* 2012). As such it is less likely that great skua will be present around the CFIIS site in the non-breeding season. GPS tracking of adult great skua from Shetland and Orkney has shown they tend to forage north and east of the Northern Isles, with smaller foraging ranges occurring when they are incubating or rearing their chick (Fox *et al.,* 2018). This suggests populations of great skua around Scotland limit themselves to the immediate area to their breeding site or use deeper water to forage over, suggesting they would not be found around the CFIIS development. Furthermore, there is only one record of a great skua within 2km of the CFIIS which occurred in 1988, highlighting the rarity of such an observation. As such, great skua associated with the Hoy SPA do not have LSE.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 153.7km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 253km away from the Hoy SPA). Hence there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of common guillemot associated with the Hoy SPA.
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 253km away from the Hoy SPA). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 426km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be not considered to be potential for ecological connectivity between the CFIIS development site and the population of black-legged kittiwake associated with the Hoy SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding peregrine	No	The core foraging range of peregrine is 2km, with a maximum recorded distance in Britain of 18km (SNH, 2016) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 253km away from the Hoy SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of peregrine associated with the Hoy SPA.
Breeding Atlantic puffin	No	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies within the theoretical foraging range (being situated approximately 253km away from the Hoy SPA). However, Atlantic puffin are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Atlantic puffin would need to travel approximately 426km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for Atlantic puffin and hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of Atlantic puffin associated with the Hoy SPA.
Breeding red-throated diver	No	The maximum and mean maximum foraging range of red-throated diver has been calculated at 9km (NatureScot, 2023a) (Table A1.1), therefore, the CFIIS development site lies outwith the theoretical foraging range (being situated approximately 253km away from the Hoy SPA). Hence, there is not considered to be potential for ecological connectivity between the CFIIS development site and the population of red-throated diver associated with the Hoy SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Hoy SPA includes common guillemot, Northern fulmar, Atlantic puffin, great black-backed gull and Arctic skua. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of Atlantic puffin, great black-backed gull and Arctic skua associated with the Hoy SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar, great skua associated with the Hoy SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Hoy SPA. There is no LSE for any qualifying interests which make up the breeding seabird assemblage at the Hoy SPA, hence there is no LSE for the breeding seabird assemblage at this site.

7.31 Sule Skerry and Sule Stack SPA

The Sule Skerry and Sule Stack are isolated islets 60km west of Mainland, Orkney, which make up the terrestrial component of the Sule Skerry and Sule Stack SPA. Sule Skerry is larger, low-lying, and vegetated, whereas Sule Stack is a higher, bare rock stack with no vascular plants (SNH, 2009r).

The boundary of the SPA overlaps with those of Sule Skerry SSSI and Sule Stack SSSI and the seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009r).

The Sule Skerry and Sule Stack SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting populations of European importance of the Annex 1 species European storm-petrel and Leach's storm-petrel (SNH, 2009r).

The Sule Skerry and Sule Stack SPA further qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of the migratory species Northern gannet and Atlantic puffin (SNH, 2009r).

The Sule Skerry and Sule Stack SPA also qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. The site regularly supports 100,000 seabirds including nationally important populations of common guillemot, European shag, Atlantic puffin, Northern gannet, European storm-petrel, and Leach's storm-petrel (SNH, 2009r).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Sule Skerry and Sule Stack SPA determined that there was unlikely to be ecological connectivity for common guillemot, Atlantic puffin, European shag, and European storm-petrel (Table 7.31.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern gannet, Leach's storm-petrel, and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.31.1). As such, Northern gannet, Leach's storm-petrel, and the breeding seabird assemblage, as qualifying interests of the Sule Skerry and Sule Stack SPA, are taken forward for screening for LSE (Table 7.31.1). It was assessed that there was LSE for Northern gannet and the breeding seabird assemblage associated with the Sule Skerry and Sule Stack SPA, which were then taken forward to the assessment of adverse effects (Section 8.14: Sule Skerry and Sule Stack SPA). No LSE was identified for Leach's storm-petrel associated with the Sule Skerry and Sule Stack SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.30.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Sule Skerry and Sule Stack SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern gannet	Yes	The mean maximum foraging range of Northern gannet has been calculated at 509.4km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 257km away from the Sule Skerry and Sule Stack SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Northern gannet associated with the Sule Skerry and Sule Stack SPA. Northern gannet have been recorded within 2km of the CFIIS (NBN, 2025) and there is LSE for Northern gannet associated with the Sule Skerry and Sule Stack SPA.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 257km away from the Sule Skerry and Sule Stack SPA). Hence there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of common guillemot associated with the Sule Skerry and Sule Stack SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Leach's storm-petrel	Yes	The mean foraging range of Leach's storm-petrel has been calculated at 657km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 257km away from the Sule Skerry and Sule Stack SPA). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Leach's storm-petrel associated with the Sule Skerry and Sule Stack SPA. Leach's storm-petrel is the most marine breeding bird in the UK, with a highly restricted breeding distribution, limited to islands within 70km of the continental shelf (BTO, 2025d). The species is migratory and therefore rarely seen between December and April whereby it returns to the few islands around Scotland where it nests (Scottish Government, 2022). It is therefore unlikely that Leach's storm-petrel would be in the vicinity of the CFIIS development site during the non-breeding season. Data on the marine distribution of this species during the breeding season in St Kilda shows that it travels far offshore to the Rosemary Bank seamount where water depths can be >1,000m. This is corroborated by at-sea surveys which have shown there to be high densities of the species at the continental shelf edge and deep waters to the northwest of Scotland, with a large presence also observed around St Kilda (Scottish Government, 2022). However, there have been no sightings of this species within 2km of the CFIIS site (NBN, 2025). As such there is no LSE for Leach's storm-petrel associated with the Sule Skerry and Sule Stack SPA.
Breeding Atlantic puffin	No	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 257km away from the Sule Skerry and Sule Stack SPA). However, Atlantic puffin are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Atlantic puffin would need to travel approximately 383km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for Atlantic puffin and hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of Atlantic puffin associated with the Sule Skerry and Sule Stack SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Sule Skerry and Sule Stack SPA includes common guillemot, Atlantic puffin, Northern gannet, European shag, European storm-petrel, and Leach's storm-petrel. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot, Atlantic puffin, European shag, and European storm-petrel associated with the Sule Skerry and Sule Stack SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern gannet and Leach's storm-petrel associated with the Sule Skerry and Sule Stack SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Sule Skerry and Sule Stack SPA. There is LSE for Northern gannet, which are within the breeding seabird assemblage for the Sule Skerry and Sule Stack SPA. As there is LSE for one or more of the qualifying interests of the breeding seabird assemblage, there is also LSE for the breeding seabird assemblage at the Sule Skerry and Sule Stack SPA.
Breeding European shag	No	The mean maximum foraging range of European shag has been calculated at 23.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 257km away from the Sule Skerry and Sule Stack SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of European shag associated with the Sule Skerry and Sule Stack SPA.
Breeding European storm-petrel	No	The mean maximum foraging range of European storm-petrel has been calculated at 336km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 257km away from the Sule Skerry and Sule Stack SPA). However, European storm-petrel are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, European storm-petrel would need to travel approximately 383km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for European storm-petrel and hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of European storm-petrel associated with the Sule Skerry and Sule Stack SPA.

7.32 North Rona and Sula Sgeir SPA

The uninhabited islands of North Rona and Sula Sgeir, together with several outlying rocky islets and adjacent waters, lie 65km north of Lewis, which makes up the terrestrial component of the North Rona and Sula Sgeir SPA. The coastlines of both islands consist mainly of cliffs except for two low-lying peninsulas on North Rona. North Rona is well covered by peat or soil and vegetated by sub-maritime grassland. Sula Sgeir lies about 15km west of North Rona. It is much the smaller of the two islands and has little soil or vegetation (SNH, 2009n).

The boundary of the SPA overlaps with the boundary of North Rona and Sula Sgeir SSSI, and the seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009n).

The North Rona and Sula Sgeir SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting populations of European importance of two Annex 1 species, European storm-petrel and Leach's storm-petrel (SNH, 2009n).

The North Rona and Sula Sgeir SPA further qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of the migratory species Northern gannet and common guillemot (SNH, 2009n).

The North Rona and Sula Sgeir SPA also qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. It regularly supports 130,000 seabirds including nationally important populations of Northern fulmar, great black-backed gull, black-legged kittiwake, razorbill, and Atlantic puffin (SNH, 2009n).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the North Rona and Sula Sgeir SPA determined that there was unlikely to be ecological connectivity for common guillemot, great black-backed gull, European storm-petrel, black-legged kittiwake, Atlantic puffin, and razorbill (Table 7.32.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern gannet, Northern fulmar, Leach's storm-petrel, and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.32.1). As such, Northern gannet, Northern fulmar, Leach's storm-petrel and the breeding seabird assemblage, as qualifying interests of the North Rona and Sula Sgeir SPA, are taken forward for screening for LSE (Table 7.32.1). It was assessed that there was LSE for Northern gannet the breeding seabird assemblage associated with the North Rona and Sula Sgeir SPA, which were then taken forward to the assessment of adverse effects (Section 8.15: North Rona and Sula Sgeir SPA). No LSE was identified for Northern fulmar, Leach's storm-petrel associated with the North Rona and Sula Sgeir SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.32.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the North Rona and Sula Sgeir SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 266km away from the North Rona and Sula Sgeir SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Northern fulmar associated with the North Rona and Sula Sgeir SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the North Rona and Sula Sgeir do not have LSE.
Breeding Northern gannet	Yes	The mean maximum foraging range of Northern gannet has been calculated at 509.4km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 266km away from the North Rona and Sula Sgeir SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Northern gannet associated with the North Rona and Sula Sgeir SPA. Northern gannet have been recorded within 2km of the CFIIS (NBN, 2025) and hence there is LSE is for Northern gannet associated with the North Rona and Sula Sgeir SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding great black-backed gull	No	The maximum and mean maximum foraging range of great black-backed gull has been calculated at 73km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 266km away from the North Rona and Sula Sgeir SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of great black-backed gull associated with the North Rona and Sula Sgeir SPA.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 95.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 266km away from the North Rona and Sula Sgeir SPA). Hence there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of common guillemot associated with the North Rona and Sula Sgeir SPA.
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 266km away from the North Rona and Sula Sgeir SPA). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 371km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for black-legged kittiwake and hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of black-legged kittiwake associated with the North Rona and Sula Sgeir SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Leach's storm-petrel	Yes	The mean foraging range of Leach's storm-petrel has been calculated at 657km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 266km away from the North Rona and Sula Sgeir SPA). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Leach's storm-petrel associated with the North Rona and Sula Sgeir SPA. Leach's storm-petrel is the most marine breeding bird in the UK, with a highly restricted breeding distribution, limited to islands within 70km of the continental shelf (BTO, 2025d). The species is migratory and therefore rarely seen between December and April whereby it returns to the few islands around Scotland where it nests (Scottish Government, 2022). It is therefore unlikely that Leach's storm-petrel would be in the vicinity of the CFIIS development site during the non-breeding season. Data on the marine distribution of this species during the breeding season in St Kilda shows that it travels far offshore to the Rosemary Bank seamount where water depths can be >1,000m. This is corroborated by at-sea surveys which have shown there to be high densities of the species at the continental shelf edge and deep waters to the northwest of Scotland, with a large presence also observed around St Kilda (Scottish Government, 2022). However, there have been no sightings of this species within 2km of the CFIIS site (NBN, 2025). As such there is no LSE for Leach's storm-petrel associated with the North Rona and Sula Sgeir SPA.
Breeding Atlantic puffin	No	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 266km away from the North Rona and Sula Sgeir SPA). Furthermore, Atlantic puffin are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Atlantic puffin would need to travel approximately 371km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for Atlantic puffin and hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of Atlantic puffin associated with the North Rona and Sula Sgeir SPA.
Breeding razorbill	No	The mean maximum foraging range of razorbill has been calculated at 122.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 266km away from the North Rona and Sula Sgeir SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of razorbill associated with the North Rona and Sula Sgeir SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the North Rona and Sula Sgeir SPA includes Atlantic puffin, Northern fulmar, great black-backed gull, black-legged kittiwake, and razorbill. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of Atlantic puffin, great black-backed gull, black-legged kittiwake, and razorbill associated with the North Rona and Sula Sgeir SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar associated with the North Rona and Sula Sgeir SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the North Rona and Sula Sgeir SPA. There is LSE for Northern gannet, which are within the breeding seabird assemblage for the North Rona and Sula Sgeir SPA. As there is LSE for one or more of the qualifying interests of the breeding seabird assemblage, there is also LSE for the breeding seabird assemblage at the North Rona and Sula Sgeir SPA.
Breeding European storm-petrel	No	The mean maximum foraging range of European storm-petrel has been calculated at 336km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 266km away from the North Rona and Sula Sgeir SPA). However, European storm-petrel are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, European storm-petrel would need to travel approximately 371km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for European storm-petrel and hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of European storm-petrel associated with the North Rona and Sula Sgeir SPA.

7.33 Copinsay SPA

The Copinsay SPA comprises a group of islands 4km off the east coast of Orkney Mainland. The islands have a cliffed rocky coastline and maritime vegetation that support large colonies of breeding seabirds (SNH, 2009f).

The boundary of the SPA encompasses Copinsay SSSI, and the seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009f).

The Copinsay SPA qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. It regularly supports 70,000 seabirds including nationally important populations of common guillemot, black-legged kittiwake, greater black-backed gull, and Northern fulmar (SNH, 2009f).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Copinsay SPA determined that there was unlikely to be ecological connectivity for great black-backed gull and common guillemot (Table 7.33.1). Nonetheless, potential ecological connectivity between the CFIIS development site and the populations of Northern fulmar, and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.33.1). As such, Northern fulmar and the breeding seabird assemblage, as qualifying interests of the Copinsay SPA, are taken forward for screening for LSE (Table 7.33.1). No LSE was identified for Northern fulmar and the breeding seabird assemblage associated with the Copinsay SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.33.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Copinsay SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 282km away from the Copinsay SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Northern fulmar associated with the Copinsay SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Copinsay SPA do not have LSE.
Breeding great black-backed gull	No	The maximum and mean maximum foraging range of great black-backed gull has been calculated at 73km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 282km away from the Copinsay SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of great black-backed gull associated with the Copinsay SPA.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 153.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 282km away from the Copinsay SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of common guillemot associated with the Copinsay SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 282km away from the Copinsay SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 477km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for black-legged kittiwake and hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of black-legged kittiwake associated with the Copinsay SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Copinsay SPA includes Northern fulmar, great black-backed gull, common guillemot, black-legged kittiwake. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of great black-backed gull, common guillemot, and black-legged kittiwake associated with the Copinsay SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar associated with the Copinsay SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Copinsay SPA. There is no LSE for any qualifying interests which make up the breeding seabird assemblage at the Copinsay SPA, hence there is no LSE for the breeding seabird assemblage at this site.

7.34 Rousay SPA

Rousay is an island off the north-east coast of Mainland, Orkney, which makes up the terrestrial component of the Rousay SPA. The SPA consists of sea cliffs and areas of maritime heath and grassland in the northwest and northeast of the island (SNH, 2009p).

The boundary of the SPA overlaps with the boundary of Rousay SSSI, and the seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009p).

The Rousay SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting a population of European importance of the Annex 1 species Arctic tern (SNH, 2009p).

The Rousay SPA also qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. The site regularly supports about 30,000 seabirds, including nationally important populations of Arctic tern, black-legged kittiwake, common guillemot, and Northern fulmar (SNH, 2009p).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Rousay SPA determined that there was unlikely to be ecological connectivity for common guillemot, black-legged kittiwake, Arctic skua, and Arctic tern (Table 7.34.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.34.1). As such, Northern fulmar and the breeding seabird assemblage, as qualifying interests of the Rousay SPA, are taken forward for screening for LSE (Table 7.34.1). No LSE was identified for Northern fulmar and the breeding seabird assemblage associated with the Rousay SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.34.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Rousay SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Arctic skua	No	The mean foraging range of Arctic skua has been calculated at 2.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 297km away from the Rousay SPA. Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of Arctic skua associated with the Rousay SPA.
Breeding Arctic tern	No	The mean maximum foraging range of Arctic tern has been calculated at 40.5km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 297km away from the Rousay SPA. Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of Arctic tern associated with the Rousay SPA.
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 297km away from the Rousay SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Northern fulmar associated with the Rousay SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Rousay SPA do not have LSE.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 153.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 297km away from the Rousay SPA). Hence there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of common guillemot associated with the Rousay SPA.
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 297km away from the Rousay SPA). However, black-legged kittiwake are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, black-legged kittiwake would need to travel approximately 455km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for black-legged kittiwake and hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of black-legged kittiwake associated with the Rousay SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Rousay SPA includes Northern fulmar, common guillemot, black-legged kittiwake, Arctic skua, and Arctic tern. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot, black-legged kittiwake, Arctic skua, and Arctic tern associated with the Rousay SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar associated with the Rousay SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Rousay SPA. There is no LSE any qualifying interests which make up the breeding seabird assemblage at the Rousay SPA, hence there is no LSE for the breeding seabird assemblage at this site.

7.35 West Westray SPA

The West Westray SPA is an 8km stretch of sea cliffs, together with adjacent grassland and heathland, along the west coast of the island of Westray in Orkney (SNH, 2009v).

The boundary of the SPA overlaps with that of the West Westray SSSI, and the seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009v).

The West Westray SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting populations of European importance of the Annex 1 species Arctic tern (SNH, 2009v).

The West Westray SPA also qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of the migratory species common guillemot (SNH, 2009v).

The West Westray SPA further qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. It regularly supports 113,000 seabirds including nationally important populations of razorbill, black-legged kittiwake, Arctic skua, and Northern fulmar (SNH, 2009v).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the West Westray SPA determined that there was unlikely to be ecological connectivity for common guillemot, black-legged kittiwake, Arctic skua, razorbill, and Arctic tern (Table 7.35.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.35.1). As such, Northern fulmar and the breeding seabird assemblage, as qualifying interests of the West Westray SPA, are taken forward for screening for LSE (Table 7.35.1). No LSE was identified for Northern fulmar and the breeding seabird assemblage associated with the West Westray SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.35.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the West Westray SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Arctic skua	No	The mean foraging range of Arctic skua has been calculated at 2.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 311km away from the West Westray SPA. Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of Arctic skua associated with the West Westray SPA.
Breeding Arctic tern	No	The mean maximum foraging range of Arctic tern has been calculated at 40.5km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 311km away from the West Westray SPA. Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of Arctic tern associated with the West Westray SPA.
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 311km away from the West Westray SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Northern fulmar associated with the West Westray SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the West Westray SPA do not have LSE.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 153.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 311km away from the West Westray SPA). Hence there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of common guillemot associated with the West Westray SPA.
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 311km away from the West Westray SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of black-legged kittiwake associated with the West Westray SPA.
Breeding razorbill	No	The mean maximum foraging range of razorbill has been recorded at 164.6km (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 311km away from the West Westray SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of razorbill associated with the West Westray SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the West Westray SPA includes Northern fulmar, black-legged kittiwake, Arctic skua, and razorbill. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of black-legged kittiwake, Arctic skua, and razorbill associated with the West Westray SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar associated with the West Westray SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the West Westray SPA. There is no LSE for any qualifying interests which make up the breeding seabird assemblage at the West Westray SPA, hence there is no LSE for the breeding seabird assemblage at this site.

7.36 Calf of Eday SPA

The Calf of Eday SPA is a small maritime island to the north of Eday in Orkney. Calf of Eday has a rocky shoreline with cliffs to the north and the west. The island is covered by maritime heath and grassland (SNH, 2009c).

The boundary of the SPA encompasses the boundary of the Calf of Eday SSSI, and the seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009c).

The Calf of Eday SPA qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. It regularly supports 30,000 seabirds including nationally important populations of great cormorant, great black-backed gull, common guillemot, Northern fulmar, and black-legged kittiwake (SNH, 2009c).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Calf of Eday SPA determined that there was unlikely to be ecological connectivity for common guillemot, great cormorant, great black-backed gull, and black-legged kittiwake (Table 7.36.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.36.1). As such, Northern fulmar and the breeding seabird assemblage, as qualifying interests of the Calf of Eday SPA, are taken forward for screening for LSE (Table 7.36.1). No LSE was identified for Northern fulmar and the breeding seabird assemblage associated with the Calf of Eday SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.36.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Calf of Eday SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding great cormorant	No	The mean maximum foraging range of great cormorant has been calculated at 33.9km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 314km away from the Calf of Eday SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of great cormorant associated with the Calf of Eday SPA.
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 314km away from the Calf of Eday SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Northern fulmar associated with the Calf of Eday SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Calf of Eday SPA do not have LSE.
Breeding great black-backed gull	No	The maximum and mean maximum foraging range of great black-backed gull has been calculated at 73km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 314km away from the Calf of Eday SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of great black-backed gull associated with the Calf of Eday SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 153.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 314km away from the Calf of Eday SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of common guillemot associated with the Calf of Eday SPA.
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 314km away from the Calf of Eday SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of black-legged kittiwake associated with the Calf of Eday SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Calf of Eday SPA includes Northern fulmar, great cormorant, great black-backed gull, common guillemot, and black-legged kittiwake. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of black-legged kittiwake, great-black backed gull, great cormorant, and razorbill associated with the Calf of Eday SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar associated with the Calf of Eday SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Calf of Eday SPA. There is no LSE for any qualifying interests which make up the breeding seabird assemblage at the Calf of Eday SPA, hence there is no LSE for the breeding seabird assemblage at this site.

7.37 Seas off Foula SPA

The Seas off Foula SPA is a marine site to the west of Shetland. It covers 3,412km^2 of inshore and offshore waters and surrounds the island of Foula. The site overlaps with low intensity spawning and nursery grounds of sandeels (*Ammodytidae*). Water depths range mainly between 50m and 150m, with deepest areas in the northwest of the site (JNCC, 2020a).

The Seas off Foula SPA qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of international importance of the migratory species great skua (JNCC, 2020a).

The Seas off Foula SPA further qualifies under Article 4.2 of the Birds Directive by regularly supporting an assemblage of breeding seabirds of >20,000 individuals, the named components of which are Northern fulmar, Arctic skua, great skua, common guillemot, and Atlantic puffin (JNCC, 2020a).

The Seas off Foula SPA also qualifies under Article 4.2 of the Birds Directive by regularly supporting an assemblage of seabirds during the non-breeding season of 20,175 individuals, the named components of which are Northern fulmar, great skua, and common guillemot (JNCC, 2020a).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Seas off Foula SPA determined that there was unlikely to be ecological connectivity for common guillemot (breeding and non-breeding), Atlantic puffin, and Arctic skua (Table 7.37.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of Northern fulmar (breeding and non-breeding), great skua (breeding and non-breeding) and subsequently, the seabird assemblage (breeding and non-breeding) associated with the SPA (Table 7.37.1). As such, Northern fulmar (breeding and non-breeding), great skua (breeding and non-breeding) and the seabird assemblage (breeding and non-breeding), as qualifying interests of the Seas off Foula SPA, are taken forward for screening for LSE (Table 7.37.1). No LSE was identified for Northern fulmar (breeding and non-breeding), great skua (breeding and non-breeding) and the seabird assemblage (breeding and non-breeding) associated with the Seas off Foula SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.37.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Seas off Foula SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Arctic skua	No	The mean foraging range of Arctic skua has been calculated at 2.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 387km away from the Seas off Foula SPA. Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of Arctic skua associated with the Seas off Foula SPA.
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 387km away from the Seas off Foula SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Northern fulmar associated with the Seas off Foula SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Seas off Foula SPA do not have LSE.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Non-breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 387km away from the Seas off Foula SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Northern fulmar associated with the Seas off Foula SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Seas off Foula SPA do not have LSE.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding great skua	Yes	The mean maximum foraging range of great skua has been calculated at 931.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 387km away from the Seas off Foula SPA). Furthermore, there is a record of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of great skua associated with the Seas off Foula SPA. Great skua are migratory, pelagic and predatory seabirds which hunt small birds, rabbits and will often mob other birds to try to relieve them of any food they have caught (BTO, 2025a). The breeding populations in the north and west of Scotland represent roughly 60% of the global population and are at the southern end of this species geographic range (Wade *et al.,* 2014). Most of this breeding population migrate south to the west coast of Africa where they overwinter, with some individuals from breeding colonies in Norway and Iceland overwintering around British shores (Magnusdottir *et al.,* 2012). As such it is less likely that great skua will be present around the CFIIS site in the non-breeding season. GPS tracking of adult great skua from Shetland and Orkney has shown they tend to forage north and east of the Northern Isles, with smaller foraging ranges occurring when they are incubating or rearing their chick (Fox *et al.,* 2018). This suggests populations of great skua around Scotland limit themselves to the immediate area to their breeding site or use deeper water to forage over, suggesting they would not be found around the CFIIS development. Furthermore, there is only one record of a great skua within 2km of the CFIIS which occurred in 1988, highlighting the rarity of such an observation. As such, great skua associated with Seas off Foula SPA do not have LSE.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Non-breeding great skua	Yes	The mean maximum foraging range of great skua has been calculated at 931.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 387km away from the Seas off Foula SPA). Furthermore, there is a record of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of great skua associated with the Seas off Foula SPA. Great skua are migratory, pelagic and predatory seabirds which hunt small birds, rabbits and will often mob other birds to try to relieve them of any food they have caught (BTO, 2025a). The breeding populations in the north and west of Scotland represent roughly 60% of the global population and are at the southern end of this species geographic range (Wade *et al.,* 2014). Most of this breeding population migrate south to the west coast of Africa where they overwinter, with some individuals from breeding colonies in Norway and Iceland overwintering around British shores (Magnusdottir *et al.,* 2012). As such it is less likely that great skua will be present around the CFIIS site in the non-breeding season. Furthermore, there is only one record of a great skua within 2km of the CFIIS which occurred in 1988, highlighting the rarity of such an observation. As such, great skua associated with the Seas off Foula SPA do not have LSE.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 153.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 387km away from the Seas off Foula SPA). Hence there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of common guillemot associated with the Seas off Foula SPA.
Non-breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 153.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 387km away from the Seas off Foula SPA). Hence there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of common guillemot associated with the Seas off Foula SPA.
Breeding Atlantic puffin	No	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 387km away from the Seas off Foula SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of Atlantic puffin associated with the Seas off Foula SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Seas off Foula SPA includes Northern fulmar, Arctic skua, great skua, and common guillemot. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of Arctic skua and common guillemot associated with the Seas off Foula SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar and great skua associated with the Seas off Foula SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Seas off Foula SPA. There is no LSE for any qualifying interests which make up the breeding seabird assemblage at the Seas off Foula SPA, hence there is no LSE for the breeding seabird assemblage at this site.
Non-breeding seabird assemblage	Yes	The non-breeding seabird assemblage associated with the Seas off Foula SPA includes Northern fulmar, great skua, and common guillemot. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of common guillemot associated with the Seas off Foula SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar and great skua associated with the Seas off Foula SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the non-breeding seabird assemblage associated with the Seas off Foula SPA. There is no LSE for any qualifying interests which make up the non-breeding seabird assemblage at the Seas off Foula SPA, hence there is no LSE for the non-breeding seabird assemblage at this site.

7.38 Sumburgh Head SPA

The Sumburgh Head SPA covers an area of cliffs and boulder beaches at the southern tip of Mainland, Shetland (SNH, 2009s).

The boundary of the Sumburgh Head SPA encompasses the boundary of the Sumburgh Head SSSI and the seaward extension extends approximately 2 km into the marine environment to include the seabed, water column and surface (SNH, 2009s).

The Sumburgh Head SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting populations of European importance of the Annex 1 species Arctic tern (SNH, 2009s).

The Sumburgh Head SPA also qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. The site regularly supports 35,000 seabirds including nationally important populations of common guillemot, black-legged kittiwake, and Northern fulmar (SNH, 2009s).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Sumburgh Head SPA determined that there was unlikely to be ecological connectivity for Arctic tern, common guillemot, and black-legged kittiwake (Table 7.38.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of breeding Northern fulmar and subsequently, the breeding seabird assemblage associated with the SPA (Table 7.38.1). As such, Northern fulmar and the breeding seabird assemblage, as qualifying interests of the Sumburgh Head SPA, are taken forward for screening for LSE (Table 7.38.1). No LSE was identified for Northern fulmar and the breeding seabird assemblage associated with the Sumburgh Head SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.38.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Sumburgh Head SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Arctic tern	No	The mean maximum foraging range of Arctic tern has been calculated at 40.5km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 416km away from the Sumburgh Head SPA. Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of Arctic tern associated with the Sumburgh Head SPA.
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 416km away from the Sumburgh Head SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Northern fulmar associated with the Sumburgh Head SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Sumburgh Head SPA do not have LSE.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 153.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 416km away from the Sumburgh Head SPA). Hence there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of common guillemot associated with the Sumburgh Head SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 416km away from the Sumburgh Head SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of black-legged kittiwake associated with the Sumburgh Head SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Sumburgh Head SPA includes Northern fulmar, black-legged kittiwake, and common guillemot. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of black-legged kittiwake and common guillemot associated with the Sumburgh Head SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar associated with the Sumburgh Head SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Sumburgh Head SPA. There is no LSE for any qualifying interests which make up the breeding seabird assemblage at the Sumburgh Head SPA, hence there is no LSE for the breeding seabird assemblage at this site.

7.39 Foula SPA

Foula is the most westerly of the Shetland Islands which are situated to the north of the Scottish mainland and Orkney, lying 20km west of Shetland Mainland and making up the terrestrial component of the Foula SPA. The SPA consists of a rocky coastline, large areas of mire, and adjacent coastal waters which support internationally important breeding populations of seabirds (SNH, 2009h).

The boundary of the SPA overlaps with the boundary of Foula SSSI and Foula Coast SSSI, and the seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009h).

The Foula SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting populations of European importance of the Annex 1 species Arctic tern and red-throated diver (SNH, 2009h).

The Foula SPA further qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of the migratory species great skua, common guillemot, Atlantic puffin, and European shag (SNH, 2009h).

The Foula SPA also qualifies under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. It regularly supports 250,000 seabirds including nationally important populations of black-legged kittiwake, razorbill, Arctic skua, Northern fulmar, Atlantic puffin, common guillemot, great skua, European shag, Leach's storm-petrel, and Arctic tern (SNH, 2009h).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Foula SPA determined that there was unlikely to be ecological connectivity for Arctic tern, Arctic skua, common guillemot, Atlantic puffin, razorbill, red-throated diver, European shag, and black-legged kittiwake (Table 7.39.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of breeding Northern fulmar, great skua, Leach's storm-petrel, and subsequently the breeding seabird assemblage associated with the SPA (Table 7.39.1). As such, Northern fulmar, great skua, Leach's storm-petrel, and the breeding seabird assemblage, as qualifying interests of the Foula SPA, are taken forward for screening for LSE (Table 7.39.1). No LSE was identified for Northern fulmar, great skua, Leach's storm-petrel and the breeding seabird assemblage associated with the Foula SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.39.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Foula SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Arctic skua	No	The mean foraging range of Arctic skua has been calculated at 2.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 416km away from the Foula SPA. Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of Arctic skua associated with the Foula SPA.
Breeding Arctic tern	No	The mean maximum foraging range of Arctic tern has been calculated at 40.5km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 416km away from the Foula SPA. Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of Arctic tern associated with the Foula SPA.
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 416km away from the Foula SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Northern fulmar associated with the Foula SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Foula SPA do not have LSE.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding great skua	Yes	The mean maximum foraging range of great skua has been calculated at 931.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 416km away from the Foula SPA). Furthermore, there is a record of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of great skua associated with the Foula SPA. Great skua are migratory, pelagic and predatory seabirds which hunt small birds, rabbits and will often mob other birds to try to relieve them of any food they have caught (BTO, 2025a). The breeding populations in the north and west of Scotland represent roughly 60% of the global population and are at the southern end of this species geographic range (Wade *et al.,* 2014). Most of this breeding population migrate south to the west coast of Africa where they overwinter, with some individuals from breeding colonies in Norway and Iceland overwintering around British shores (Magnusdottir *et al.,* 2012). As such it is less likely that great skua will be present around the CFIIS site in the non-breeding season. GPS tracking of adult great skua from Shetland and Orkney has shown they tend to forage north and east of the Northern Isles, with smaller foraging ranges occurring when they are incubating or rearing their chick (Fox *et al.,* 2018). This suggests populations of great skua around Scotland limit themselves to the immediate area to their breeding site or use deeper water to forage over, suggesting they would not be found around the CFIIS development. Furthermore, there is only one record of a great skua within 2km of the CFIIS which occurred in 1988, highlighting the rarity of such an observation. As such, great skua associated with the Foula SPA do not have LSE.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 153.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 416km away from the Foula SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of common guillemot associated with the Foula SPA.
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 416km away from the Foula SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of black-legged kittiwake associated with the Foula SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Leach's storm-petrel	Yes	The mean foraging range of Leach's storm-petrel has been calculated at 657km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 416km away from the Foula SPA). However, Leach's storm-petrel are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Leach's storm-petrel would need to travel approximately 560km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be within the mean foraging distance for Leach's storm-petrel and hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Leach's storm-petrel associated with the Foula SPA. Leach's storm-petrel is the most marine breeding bird in the UK, with a highly restricted breeding distribution, limited to islands within 70km of the continental shelf (BTO, 2025d). The species is migratory and therefore rarely seen between December and April whereby it returns to the few islands around Scotland where it nests (Scottish Government, 2022). It is therefore unlikely that Leach's storm-petrel would be in the vicinity of the CFIIS development site during the non-breeding season. Data on the marine distribution of this species during the breeding season in St Kilda shows that it travels far offshore to the Rosemary Bank seamount where water depths can be >1,000m. This is corroborated by at-sea surveys which have shown there to be high densities of the species at the continental shelf edge and deep waters to the northwest of Scotland, with a large presence also observed around St Kilda (Scottish Government, 2022). However, there have been no sightings of this species within 2km of the CFIIS site (NBN, 2025). As such there is no LSE for Leach's storm-petrel associated with the Foula SPA.
Breeding Atlantic puffin	No	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 416km away from the Foula SPA). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Atlantic puffin associated with the Foula SPA.
Breeding razorbill	No	The mean maximum foraging range of razorbill has been calculated at 164.6km (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 416km away from the Foula SPA. Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of razorbill associated with the Foula SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding red-throated diver	No	The maximum and mean maximum foraging range of red-throated diver has been calculated at 9km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 416km away from the Foula SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of red-throated diver associated with the Foula SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Foula SPA includes black-legged kittiwake, razorbill, Arctic skua, Northern fulmar, Atlantic puffin, common guillemot, great skua, European shag, Leach's storm-petrel. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of black-legged kittiwake, razorbill, Arctic skua, Atlantic puffin, common guillemot, and European shag associated with the Foula SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar, great skua, and Leach's storm-petrel associated with the Foula SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Foula SPA. There is no LSE anticipated for any qualifying interests which make up the breeding seabird assemblage at the Foula SPA, hence there is no LSE for the breeding seabird assemblage at this site.
Breeding European shag	No	The mean maximum foraging range of European shag has been calculated at 23.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 416km away from the Foula SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of European shag associated with the Foula SPA.

7.40 Noss SPA

The Noss SPA is an offshore island lying 5km east of Lerwick, Shetland. It supports breeding seabirds on cliffs and also on inland heathlands and grasslands (SNH, 2009o).

The boundary of the SPA overlaps that of the Noss SSSI and National Nature Reserve (NNR) and the seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009o).

The Noss SPA qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of the migratory species Northern gannet, great skua, and common guillemot (SNH, 2009o).

The Noss SPA also qualifies under Article 4.2 by regularly supporting in excess of 20,000 individual seabirds. It regularly supports 35,000 seabirds including, in addition to the species listed above, nationally important populations of Northern fulmar, black-legged kittiwake, and Atlantic puffin (SNH, 2009o).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Noss SPA determined that there was unlikely to be ecological connectivity for common guillemot, Atlantic puffin, and black-legged kittiwake (Table 7.40.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of breeding Northern fulmar, Northern gannet, great skua, and subsequently the breeding seabird assemblage associated with the SPA (Table 7.40.1). As such, Northern fulmar, Northern gannet, great skua, and the breeding seabird assemblage, as qualifying interests of the Noss SPA, are taken forward for screening for LSE (Table 7.40.1). It was assessed that there was LSE for Northern gannet and the breeding seabird assemblage associated with the Noss SPA, which were then taken forward to the assessment of adverse effects (Section 8.16: Noss SPA). No LSE was identified for Northern fulmar and great skua associated with the Noss SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.40.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Noss SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 449km away from the Noss SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Northern fulmar associated with the Noss SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Noss SPA do not have LSE.
Breeding Northern gannet	Yes	The mean maximum foraging range of Northern gannet has been calculated at 509.4km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 449km away from the Noss SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Northern gannet associated with the Noss SPA. Northern gannet have been recorded within 2km of the CFIIS (NBN, 2025) and hence there is LSE for Northern gannet associated with the Noss SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding great skua	Yes	The mean maximum foraging range of great skua has been calculated at 931.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 449km away from the Noss SPA). Furthermore, there is a record of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of great skua associated with the Noss SPA. Great skua are migratory, pelagic and predatory seabirds which hunt small birds, rabbits and will often mob other birds to try to relieve them of any food they have caught (BTO, 2025a). The breeding populations in the north and west of Scotland represent roughly 60% of the global population and are at the southern end of this species geographic range (Wade *et al.,* 2014). Most of this breeding population migrate south to the west coast of Africa where they overwinter, with some individuals from breeding colonies in Norway and Iceland overwintering around British shores (Magnusdottir *et al.,* 2012). As such it is less likely that great skua will be present around the CFIIS site in the non-breeding season. GPS tracking of adult great skua from Shetland and Orkney has shown they tend to forage north and east of the Northern Isles, with smaller foraging ranges occurring when they are incubating or rearing their chick (Fox *et al.,* 2018). This suggests populations of great skua around Scotland limit themselves to the immediate area to their breeding site or use deeper water to forage over, suggesting they would not be found around the CFIIS development. Furthermore, there is only one record of a great skua within 2km of the CFIIS which occurred in 1988, highlighting the rarity of such an observation. As such, great skua associated with the Noss SPA do not have LSE.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 153.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 449km away from the Noss SPA). Hence there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of common guillemot associated with the Noss SPA.
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 449km away from the Noss SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of black-legged kittiwake associated with the Noss SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Atlantic puffin	No	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 449km away from the Noss SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of Atlantic puffin associated with the Noss SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Noss SPA includes black-legged kittiwake, Northern fulmar, and Atlantic puffin. One of these species are deemed to have ecological connectivity. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of black-legged kittiwake and Atlantic puffin associated with the Noss SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar associated with the Noss SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Noss SPA. There is LSE for Northern gannet, which are within the breeding seabird assemblage for the Noss SPA. As there is LSE for one or more of the qualifying interests of the breeding seabird assemblage, there is also LSE for the breeding seabird assemblage at the Noss SPA.

7.41 Hermaness, Saxa Vord and Valla Field SPA

The Hermaness, Saxa Vord and Valla Field SPA lies in the north-west corner of the island of Unst, Shetland, at the northernmost tip of Britain. It consists of 100-200m high sea cliffs and adjoining areas of grassland, heath, and blanket bog (SNH, 2009k).

The boundary of the SPA overlaps that of the Hermaness SSSI, Saxa Vord SSSI, and Valla Field SSSI. The seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface (SNH, 2009k).

Part of the site (Hermaness SSSI and Saxa Vord SSSI) was previously classified as Hermaness and Saxa Vord SPA on 29th March 1994 for Northern fulmar, Northern gannet, great skua, common guillemot and Atlantic puffin (SNH, 2009k).

The Hermaness, Saxa Vord and Valla Field SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting populations of European importance of the Annex I species red-throated diver (SNH, 2009k).

The Hermaness, Saxa Vord and Valla Field SPA also qualifies under Article 4.2 of the Birds Directive by regularly supporting populations of European importance of the migratory species Northern gannet, great skua, and Atlantic puffin (SNH, 2009k).

The Hermaness, Saxa Vord and Valla Field SPA qualifies further under Article 4.2 of the Birds Directive by regularly supporting in excess of 20,000 individual seabirds. It regularly support 157,500 seabirds including nationally important populations of Northern fulmar, European shag, common guillemot, and black-legged kittiwake (SNH, 2009k).

An assessment for potential ecological connectivity between the CFIIS development site and the ornithological qualifying interests associated with the Hermaness, Saxa Vord and Valla Field SPA determined that there was unlikely to be ecological connectivity for red-throated diver, European shag, Northern gannet, common guillemot, Atlantic puffin, and black-legged kittiwake (Table 7.41.1). Nonetheless, potential ecological connectivity was identified between the CFIIS development site and the populations of breeding Northern fulmar, great skua, and subsequently the breeding seabird assemblage associated with the SPA (Table 7.41.1). As such, Northern fulmar, great skua, and the breeding seabird assemblage, as qualifying interests of the Hermaness, Saxa Vord and Valla Field SPA, are taken forward for screening for LSE (Table 7.41.1). No LSE was identified for Northern fulmar, great skua and the breeding seabird assemblage associated with the Hermaness, Saxa Vord and Valla Field SPA, and hence they are not taken forward to the assessment of adverse effects.

Table 7.41.1: Assessment for Potential Ecological Connectivity and LSE of the Qualifying Interests Associated with the Hermaness, Saxa Vord and Valla Field SPA

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Northern fulmar	Yes	The mean maximum foraging range of Northern fulmar has been calculated at 1200.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 510km away from the Hermaness, Saxa Vord and Valla Field SPA). Furthermore, there are records of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of Northern fulmar associated with the Hermaness, Saxa Vord and Valla Field SPA. Northern fulmar are a stocky, pelagic seabird which nest and breed on cliffs around the UK, especially those in the north of Scotland (BTO, 2025b). Breeding occurs between April and mid-September, however Northern fulmar are present all year round in UK waters and hence are more likely to be observed during the breeding season at the CFIIS, though could be present at any time (Scottish Government, 2022). From March to July the highest densities of individuals occur over the continental shelf edge, far offshore, most likely on foraging trips (Stone *et al.,* 1995). Post-fledging of young they are more prevalent in the North Sea, with many of these juveniles not returning to land for four or five years (BTO, 2025b; Stone *et al.,* 1995). It has been shown in one individual that they will travel as far as the Charlie-Gibbs Fracture Zone, a benthic region of the northern mid-Atlantic, culminating in a 6,200km round trip, showing the readiness of Northern fulmar to travel far offshore on foraging trips (Edwards *et al.,* 2013). Furthermore, there is only one record of a Northern fulmar with 2km of the CFIIS site which occurred in 2011, showing how uncommon they are in the area. As such, Northern fulmar associated with the Hermanness, Saxa Vord and Valla Field SPA do not have LSE.
Breeding Northern gannet	No	The mean maximum foraging range of Northern gannet has been calculated at 509.4km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 510km away from the Hermaness, Saxa Vord and Valla Field SPA). However, Northern gannet are a pelagic species, that would generally only be expected to travel over marine and coastal habitats. As such, Northern gannet would need to travel approximately 663km through marine/coastal habitats to reach the CFIIS development site. As such, the CFIIS site is considered to be outwith the mean maximum foraging distance for Northern gannet and hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of Northern gannet associated with the Hermaness, Saxa Vord and Valla Field SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding great skua	Yes	The mean maximum foraging range of great skua has been calculated at 931.2km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies within the theoretical foraging range (being situated approximately 510km away from the Hermaness, Saxa Vord and Valla Field SPA). Furthermore, there is a record of the species within the proximity of the CFIIS development site (NBN, 2025). Hence, there is considered to be potential for ecological connectivity between the area of the proposed development site and the population of great skua associated with the Hermaness, Saxa Vord and Valla Field SPA. Great skua are migratory, pelagic and predatory seabirds which hunt small birds, rabbits and will often mob other birds to try to relieve them of any food they have caught (BTO, 2025a). The breeding populations in the north and west of Scotland represent roughly 60% of the global population and are at the southern end of this species geographic range (Wade *et al.,* 2014). Most of this breeding population migrate south to the west coast of Africa where they overwinter, with some individuals from breeding colonies in Norway and Iceland overwintering around British shores (Magnusdottir *et al.,* 2012). As such it is less likely that great skua will be present around the CFIIS site in the non-breeding season. GPS tracking of adult great skua from Shetland and Orkney has shown they tend to forage north and east of the Northern Isles, with smaller foraging ranges occurring when they are incubating or rearing their chick (Fox *et al.,* 2018). This suggests populations of great skua around Scotland limit themselves to the immediate area to their breeding site or use deeper water to forage over, suggesting they would not be found around the CFIIS site. Furthermore, there is only one record of a great skua within 2km of the CFIIS which occurred in 1988, highlighting the rarity of such an observation. As such, great skua associated with the Hermaness, Saxa Vord and Valla Field SPA do not have LSE.
Breeding common guillemot	No	The mean maximum foraging range of common guillemot has been calculated at 153.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 510km away from the Hermaness, Saxa Vord and Valla Field SPA). Hence there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of common guillemot associated with the Hermaness, Saxa Vord and Valla Field SPA.
Breeding black-legged kittiwake	No	The mean maximum foraging range of black-legged kittiwake has been calculated at 300.6km (NatureScot. 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 510km away from the Hermaness, Saxa Vord and Valla Field SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of black-legged kittiwake associated with the Hermaness, Saxa Vord and Valla Field SPA.

Qualifying Interest	Potential Ecological Connectivity (Yes/No)	Assessment Summary
Breeding Atlantic puffin	No	The mean maximum foraging range of Atlantic puffin has been calculated at 265.4km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 510km away from the Hermaness, Saxa Vord and Valla Field SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of Atlantic puffin associated with the Hermaness, Saxa Vord and Valla Field SPA.
Breeding red-throated diver	No	Maximum and mean maximum foraging range of red-throated diver has been calculated at 9km (NatureScot, 2023a)(Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 510km away from the Hermaness, Saxa Vord and Valla Field SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of red-throated diver associated with the Hermaness, Saxa Vord and Valla Field SPA.
Breeding seabird assemblage	Yes	The breeding seabird assemblage associated with the Hermaness, Saxa Vord and Valla Field SPA includes black-legged kittiwake, Northern fulmar, common guillemot, and European shag. All these species are assessed individually within the sections above. No potential for ecological connectivity was identified between the CFIIS site and the populations of black-legged kittiwake common guillemot and European shag associated with the Hermaness, Saxa Vord and Valla Field SPA. However, potential for ecological connectivity was identified between the CFIIS site and the populations of Northern fulmar associated with the Hermaness, Saxa Vord and Valla Field SPA. Therefore, there is potential for ecological connectivity between the CFIIS development site, and the breeding seabird assemblage associated with the Hermaness, Saxa Vord and Valla Field SPA. There is no LSE for any qualifying interests which make up the breeding seabird assemblage at the Hermaness, Saxa Vord and Valla Field SPA, hence there is no LSE for the breeding seabird assemblage at this site.
Breeding European shag	No	The mean maximum foraging range of European shag has been calculated at 23.7km (NatureScot, 2023a) (Table A1.1), therefore, the proposed development site lies outwith the theoretical foraging range (being situated approximately 510km away from the Hermaness, Saxa Vord and Valla Field SPA). Hence, there is not considered to be potential for ecological connectivity between the area of the proposed development site and the population of European shag associated with the Hermaness, Saxa Vord and Valla Field SPA.

8 Assessment of Adverse Effects

All the qualifying interests included within this section have already been identified to have potential for LSE (Table 8.0.1). Hence, this section assesses all qualifying interests associated with European Sites.

Table 8.0.1: Qualifying Interest of European Sites Considered to Have LSE to Occur Due to the CFIIS

European Site	Qualifying Interest(s)
Moidart and Ardgour SPA	**Breeding:** • Golden eagle.
Glen Etive and Glen Fyne SPA	**Breeding:** • Golden eagle.
Eileanan Agus Sgeiran Lios Mor SAC	• Harbour seal.
Inner Hebrides and Minches SAC	• Harbour porpoise.
Rum SPA	**Breeding:** • Black-legged kittiwake; and • Breeding seabird assemblage
Canna and Sanday SPA	**Breeding:** • Herring gull; • Black-legged kittiwake; and • Breeding seabird assemblage.
Shiant Isles SPA	**Breeding:** • Black-legged kittiwake; and • Breeding seabird assemblage.
Mingulay and Berneray SPA	**Breeding:** • Black-legged kittiwake; and • Breeding seabird assemblage.
Ailsa Craig SPA	**Breeding:** • Black-legged kittiwake; • Lesser black-backed gull; • Northern gannet; and • Breeding seabird assemblage.
Handa SPA	**Breeding:** • Black-legged kittiwake; and • Breeding seabird assemblage.
Seas off St Kilda SPA	**Breeding:** • Northern gannet; and • Breeding seabird assemblage.
Flannan Isles SPA	**Breeding:** • Black-legged kittiwake; and • Breeding seabird assemblage.
St Kilda SPA	**Breeding:** • Black-legged kittiwake; • Northern gannet; and • Breeding seabird assemblage.
Sule Skerry and Sule Stack SPA	**Breeding:** • Northern gannet; and • Breeding seabird assemblage.
North Rona and Sula Sgeir SPA	**Breeding:** • Northern gannet; and • Breeding seabird assemblage.

European Site	Qualifying Interest(s)
Noss SPA	**Breeding:** • Northern gannet; and • Breeding seabird assemblage.

It is the responsibility of Marine Directorate to determine whether there will be any adverse effects on European Sites. However, based on sound understanding of the CFIIS and the ecological nature of the site, an assessment has been undertaken to determine whether there are likely to be any adverse effects associated with the CFIIS Development. The assessment for adverse effects is largely based on the findings of the EIA. It can be assumed that if there is unlikely to be a significant effect (in EIA terms) upon a species or habitat, then there would unlikely be an adverse effect on any conservation objectives associated with qualifying interests of European Sites.

The following sections provide an overview of the qualifying interests of European Sites which are considered to have potential for LSE and detailing their assessment for adverse effects.

8.1 Moidart and Ardgour SPA

The conservation objectives for the Moidart and Ardgour SPA are shown in Table 8.1.1. An assessment of the potential for adverse effects for each qualifying interest included for the Moidart and Ardgour SPA is shown in Table 8.1.2.

Table 8.1.1: Conservation Objectives of the Moidart and Ardgour SPA

Conservation Objectives of the European Site
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.
Further Conservation Objectives: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within the site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species.

The potential for significant effects (in EIA terms) to occur on the ornithological receptor due to the CFIIS has been assessed within the Terrestrial Ecology and Ornithology chapter of the EIA (see Chapter 11: Terrestrial Ecology and Ornithology). Mitigation has been proposed in order to minimise effects to birds, which has ensured that all impacts to ornithological receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the qualifying interests listed in Table 8.1.1, and therefore the Moidart and Ardgour SPA. Further details, including the relevant sections of the EIA are provided in Table 8.1.2.

Table 8.1.2: Qualifying Interests of the Moidart and Ardgour SPA

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding golden eagle	Chapter 11: Terrestrial Ecology and Ornithology: • 11.2 • 11.4.1.1 • 11.5.1 • 11.5.1.2 • 11.5.5.7 • 11.7.1.1.4.6 • 11.7.2.1.4 • 11.7.2.1.4.2 • 11.10.1	The Moidart and Ardgour SPA supports more than 2.4% of the Great Britain (GB) population of golden eagle (11 active territories in 2003) (SNH, 2010b). The core range for the species is 6km (SNH, 2016) and there are no known breeding sites within this distance from the CFIIS site (Duncan, 2024). However, there are no known records of golden eagle within 2km of the CFIIS (NBN, 2025). Golden eagle are not expected to favour the area of the CFIIS, as it is surrounded by more suitable habitat that is designated for their protection. Furthermore, the area around the CFIIS is subject to fragmentation and anthropogenic disturbance associated with its urban usage, which is expected to limit prey resources. Golden eagle are known to use the same home range during the breeding season as they do for the non-breeding season, although it is expected that they may use different areas for breeding nests and winter roosts (Hardey *et al.*, 2013). However, golden eagle have a maximum disturbance distance of 250-500m during the breeding season (NatureScot, 2025) and hence they have been assessed for disturbance from the construction of the CFIIS and habitat modification from the operational phase. Any increases in disturbance from the construction of the CFIIS are expected to be highly localised and in an area where golden eagle are not expected to be. The fragmentation of the area is caused by public highways and residential areas leaving available pockets of habitat which are small in size and subjected to ongoing disturbance (Fielding et al., 2024). Considering that the area that will be lost in the construction of the CFIIS is 3ha and that the average foraging range of golden eagle in Argyll during the winter is 6,827ha (McGrady et al., 1997), this would only result in the temporary avoidance of <0.05% of the total foraging range. Therefore, based on the current data on golden eagle nesting sites, their average winter range size and the lack of suitability of the area for the species the CFIIS would not result in an impact on golden eagle distribution or population size. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Moidart and Ardgour SPA.

8.2 Glen Etive and Glen Fyne SPA

The conservation objectives for the Glen Etive and Glen Fyne SPA are shown in Table 8.2.1. An assessment of the potential for adverse effects for each qualifying interest included for the Glen Etive and Glen Fyne SPA is shown in Table 8.2.2.

Table 8.2.1: Conservation Objectives of the Glen Etive and Glen Fyne SPA

Conservation Objectives of the European Site
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.
Further Conservation Objectives: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within the site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species.

The potential for significant effects (in EIA terms) to occur on the ornithological receptor due to the CFIIS has been assessed within the Terrestrial Ecology and Ornithology chapter of the EIA (see Chapter 11: Terrestrial Ecology and Ornithology). Mitigation has been proposed in order to minimise effects to birds, which has ensured that all impacts to ornithological receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the qualifying interests listed in Table 8.2.1, and therefore the Glen Etive and Glen Fyne SPA. Further details, including the relevant sections of the EIA are provided in Table 8.2.2.

Table 8.2.2: Qualifying Interests of the Glen Etive and Glen Fyne SPA

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding golden eagle	Chapter 11: Terrestrial Ecology and Ornithology: • 11.2 • 11.4.1.1 • 11.5.1 • 11.5.1.3 • 11.5.5.7 • 11.7.1.1.4.6 • 11.7.2.1.4 • 11.7.2.1.4.2 • 11.10.1	The Glen Etive and Glen Fyne SPA supports more than 4.2% of the GB population of golden eagle (19 active territories in 2003) (SNH, 2010b). The core range for the species is 6km (SNH, 2016) and there are no known breeding sites within this distance from the CFIIS site (Duncan, 2024). However, there are no known records of golden eagle within 2km of the CFIIS (NBN, 2025). Golden eagle are not expected to favour the area of the CFIIS, as it is surrounded by more suitable habitat that is designated for their protection. Furthermore, the area around the CFIIS is subject to fragmentation and anthropogenic disturbance associated with its urban usage, which is expected to limit prey resources. Golden eagle are known to use the same home range during the breeding season as they do for the non-breeding season, although it is expected that they may use different areas for breeding nests and winter roosts (Hardey et al., 2013). However, golden eagle have a maximum disturbance distance of 250-500m during the breeding season (NatureScot, 2025) and hence they have been assessed for disturbance from the construction of the CFIIS and habitat modification from the operational phase. Any increases in disturbance from the construction of the CFIIS are expected to be highly localised and in an area where golden eagle are not expected to be. The fragmentation of the area is caused by public highways and residential areas leaving available pockets of habitat which are small in size and subjected to ongoing disturbance (Fielding et al., 2024). Considering that the area that will be lost in the construction of the CFIIS is 3ha and that the average foraging range of golden eagle in Argyll during the winter is 6,827ha (McGrady et al., 1997), this would only result in the temporary avoidance of <0.05% of the total foraging range. Therefore, based on the current data on golden eagle nesting sites, their average winter range size and the lack of suitability of the area for the species the CFIIS would not result in an impact on golden eagle distribution or population size. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Glen Etive and Glen Fyne SPA.

8.3 Eileanan Agus Sgeiran Lios Mor SAC

The conservation objectives for the Eileanan Agus Sgeiran Lios Mor SAC are shown in Table 8.3.1. An assessment of the potential for adverse effects for each qualifying interest included for the Eileanan Agus Sgeiran Lios Mor SAC is shown in Table 8.3.2.

Table 8.3.1: Conservation Objectives of the Eileanan Agus Sgeiran Lios Mor SAC

Conservation Objectives of the European Site
Overarching Conservation Objective: 1. To ensure that harbour seals at Eileanan agus Sgeiran Lios mór SAC are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status; and 2. To ensure that the integrity of Eileanan agus Sgeiran Lios mór SAC is maintained in the context of environmental changes by meeting objectives 2a, 2b and 2c.
Further Conservation Objectives: 2a. The population of harbour seal is a viable component of the site. 2b. The distribution of harbour seal throughout the site is maintained by avoiding significant disturbance of harbour seal. 2c. The supporting habitats relevant to harbour seal are maintained

The potential for significant effects (in EIA terms) to marine mammal receptors to occur due to the CFIIS has been assessed within the Marine Mammals chapter of the EIA (see Chapter 12: Marine Mammals). Mitigation has been proposed in order to minimise effects to harbour seal, which has ensured that all impacts to marine mammal receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the qualifying interests listed in Table 8.3.1, and therefore the Eileanan Agus Sgeiran Lios Mor SAC. Further details, including the relevant sections of the EIA are provided in Table 8.3.2.

Table 8.3.2: Qualifying Interests of the Eileanan Agus Sgeiran Lios Mor SAC

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Harbour Seal	Chapter 12: Marine Mammals: • 12.3.2 • 12.4.2 • 12.5.1 • 12.5.1.1 • 12.5.1.3 • 12.5.2.2.2 • 12.7.1.1.4 • 12.7.1.2	The Eileanan Agus Sgeiran Lios Mor SAC supports just over 1% of the UK population of harbour seal (JNCC, 2024d), with the UK itself holding 32% of the European population (Special Committee on Seals (SCOS), 2022). Harbour seal are susceptible to hearing impairment from loud noises, especially the construction technique of blasting, which will generate a large amount of underwater noise. It has been suggested through underwater noise modelling that this could occur at distances of 530m, resulting in a significant effect. Mitigation to be implemented has been proposed, which would reduce the impact to non-significant. They are also at risk of increased vessel movements during the construction phase of the CFIIS, though it is expected they will have a degree of habituation to vessel movements already present in Loch Linnhe. This increase in vessel movements will not be proportionally large as the area is used frequently and so is not expected to cause significant disturbance, resulting a non-significant effect. Harbour seal may also be subject to physical injury due to dredge disposal at the Armadale Disposal Site, though only if they are directly underneath the vessel as it deposits dredge material. This is highly unlikely though is still a potential significant impact. As such a marine mammal protocol will be implemented which will ensure no marine mammals are present beneath the disposal vessel at the point of disposal, reducing the effect to non-significant. Therefore, based on the proposed mitigation for harbour seal and their predicted habituation to vessel movements the CFIIS would not result in an impact on harbour seal population or distribution. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Eileanan Agus Sgeiran Lios Mor SAC.

8.4 Inner Hebrides and the Minches SAC

The conservation objectives for the Inner Hebrides and the Minches SAC are shown in Table 8.4.1. An assessment of the potential for adverse effects for each qualifying interest included for the Inner Hebrides and Minches SAC is shown in Table 8.4.2.

Table 8.4.1: Conservation Objectives of the Inner Hebrides and the Minches SAC

Conservation Objectives of the European Site
Overarching Conservation Objective: 1. To ensure that the Inner Hebrides and the Minches SAC continues to make an appropriate contribution to harbour porpoise remaining at favourable conservation status; and 2. To ensure for harbour porpoise within the context of environmental changes, that the integrity of the Inner Hebrides and the Minches SAC is maintained through 2a, 2b and 2c.
Further Conservation Objectives: 2a. Harbour porpoise within the Inner Hebrides and the Minches are not at significant risk from injury or killing. 2b. The distribution of harbour porpoise throughout the site is maintained by avoiding significant disturbance. 2c. The condition of supporting habitats and the availability of prey for harbour porpoise are maintained.

The potential for significant effects (in EIA terms) to marine mammal receptors to occur due to the CFIIS has been assessed within the Marine Mammals chapter of the EIA (see Chapter 12: Marine Mammals). Mitigation has been proposed in order to minimise effects to harbour porpoise, which has ensured that all impacts to marine mammal receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the qualifying interests listed in Table 8.4.1, and therefore the Inner Hebrides and Minches SAC. Further details, including the relevant sections of the EIA are provided in Table 8.4.2.

Table 8.4.2: Qualifying Interests of the Inner Hebrides and Minches SAC

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Harbour porpoise	Chapter 12: Marine Mammals: • 12.3.1.1 • 12.4.2 • 12.5.1 • 12.5.1.2 • 12.5.2.1 • 12.5.2.1.1 • 12.7.1.1.1 • 12.7.1.1.2 • 12.7.1.1.3 • 12.7.1.1.4 • 12.7.1.2 • 12.7.1.3 • 12.7.2.1 • 12.7.2.3 • 12.8.2	The Inner Hebrides and Minches SAC is designated for the qualifying feature of harbour porpoise (JNCC, 2019). Harbour porpoise are susceptible to hearing impairment from loud noises, which in the context of the CFIIS may arise from general construction techniques, piling, rock breaking and blasting. The latter of these is the only method to result in a significant effect, with harbour porpoise needing to be within 4km for this to occur. As such mitigation is proposed through the use of a bubble curtain which will reduce the magnitude of the sound created and reduce the impact to non-significant. Harbour porpoise may also be impacted by vessel movements during the construction phase. Harbour porpoise are expected to be habituated to vessel movements and the low proportional increase is not expected to cause a significant effect. During the operational phase vessel movements and dredge disposal may impact harbour porpoise, with the same mitigation used as for the construction phase. The distribution of the species will not be affected as blasting will occur for a short period of time, after which there will be no effect of construction on harbour porpoise. Harbour porpoise may also be subject to physical injury due to dredge disposal at the Armadale Disposal Site during the construction phase, though only if they are directly underneath the vessel as it deposits dredge material. This is highly unlikely though is still a potential significant impact. As such a marine mammal protocol will be implemented which will ensure no marine mammals are present beneath the disposal vessel at the point of disposal, reducing the effect to non-significant. Therefore, based on the proposed mitigation for harbour porpoise and their predicted habituation to vessel movements the CFIIS would not result in an impact on harbour porpoise distribution or physical injury. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Inner Hebrides and Minches SAC.

8.5 Rum SPA

The conservation objectives for the Rum SPA are shown in Table 8.5.1. An assessment of the potential for adverse effects for each qualifying interest included for the Rum SPA is shown in Table 8.5.2.

Table 8.5.1: Conservation Objectives of the Rum SPA

Conservation Objectives of the European Site
Overarching Conservation Objective: 1. To ensure that the qualifying features of Rum SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status; and 2. To ensure that the integrity of Rum SPA is restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature.
Further Conservation Objectives: 2a. The populations of the qualifying features are viable components of Rum SPA. 2b. The distributions of the qualifying features throughout the site are maintained by avoiding significant disturbance of the species. 2c. The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained, or where appropriate, restored at Rum SPA.

The potential for significant effects (in EIA terms) to occur on the ornithological receptor due to the CFIIS has been assessed within the Terrestrial Ecology and Ornithology chapter of the EIA (see Chapter 11: Terrestrial Ecology and Ornithology). Mitigation has been proposed in order to minimise effects to birds, which has ensured that all impacts to ornithological receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the qualifying interests listed in Table 8.5.1, and therefore the Rum SPA. Further details, including the relevant sections of the EIA are provided in Table 8.5.2.

Table 8.5.2: Qualifying Interests of the Rum SPA

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding black-legged kittiwake (breeding seabird assemblage)	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.11 • 11.5.5 • 11.5.5.11 • 11.7.1.1.4 • 11.7.1.1.4.2	The Rum SPA supports 0.3% of the GB population of black-legged kittiwake (1,500 pairs) (NatureScot, 2020b). Black-legged kittiwake are the most marine species of gull in the UK, which nest on maritime cliffs and ledges (Mousley and Kershaw, 2023). There are no suitable nesting areas for this species in the vicinity of the CFIIS and hence disturbance is not expected for birds actively breeding in the area. Individuals which use the area to forage are expected to be habituated to disturbance in the form of vessel movements and hence will be used to disturbance arising from the construction of the CFIIS. If black-legged kittiwake are disturbed and avoid the area, the avoidance will be small and localised. Therefore, based on the ecology of black-legged kittiwake and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in and impact on black-legged kittiwake distribution or prey availability, nor does it affect the breeding seabird assemblage. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Rum SPA.

8.6 Canna and Sanday SPA

The conservation objectives for the Canna and Sanday SPA are shown in Table 8.6.1. An assessment of the potential for adverse effects for each qualifying interest included for the Canna and Sanday SPA is shown in Table 8.6.2.

Table 8.6.1: Conservation Objectives of the Canna and Sanday SPA

Conservation Objectives of the European Site
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.
Further Conservation Objectives: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within the site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species.

The potential for significant effects (in EIA terms) to occur on the ornithological receptor due to the CFIIS has been assessed within the Terrestrial Ecology and Ornithology chapter of the EIA (see Chapter 11: Terrestrial Ecology and Ornithology). Mitigation has been proposed in order to minimise effects to birds, which has ensured that all impacts to ornithological receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the

qualifying interests listed in Table 8.6.1, and therefore the Canna and Sanday SPA. Further details, including the relevant sections of the EIA are provided in Table 8.6.2.

Table 8.6.2: Qualifying Interests of the Canna and Sanday SPA

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding herring gull (breeding seabird assemblage)	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.12 • 11.5.5 • 11.5.5.10 • 11.7.1.1.4.3 • 11.7.2.1.4.4	The Canna and Sanday SPA supports 0.8% of the GB population of herring gull (1,300 pairs) (SNH, 2009d). Herring gull are well established in the area of the CFIIS (NBN, 2025). Hence those which already choose to nest or forage within the area of the CFIIS planning boundary will have some level of habituation to disturbance, due to ongoing vessel movements and people. If individuals are displaced during construction, the result would be localised, especially when considering the abundance of available habitat in the immediate area. Therefore, based on the prevalence of herring gull and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in and impact on herring gull distribution or disturbance, nor does it affect the breeding seabird assemblage. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Canna and Sanday SPA.
Breeding black-legged kittiwake (breeding seabird assemblage)	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.12 • 11.5.5 • 11.5.5.11 • 11.7.1.1.4 • 11.7.1.1.4.2	The Canna and Sanday SPA supports 0.1% of the GB population of black-legged kittiwake (930 pairs) (SNH, 2009d). Black-legged kittiwake are the most marine species of gull in the UK, which nest on maritime cliffs and ledges (Mousley and Kershaw, 2023). There are no suitable nesting areas for this species in the vicinity of the CFIIS and hence disturbance is not expected for birds actively breeding in the area. Individuals which use the area to forage are expected to be habituated to disturbance in the form of vessel movements and hence will be used to disturbance arising from the construction of the CFIIS. If black-legged kittiwake are disturbed and avoid the area, the avoidance will be small and localised. Therefore, based on the ecology of black-legged kittiwake and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in an impact on black-legged kittiwake distribution and prey availability. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Canna and Sanday SPA.

8.7 Shiant Isles SPA

The conservation objectives for the Shiant Isles SPA are shown in Table 8.7.1. An assessment of the potential for adverse effects for each qualifying interest included for the Shiant Isles SPA is shown in Table 8.7.2.

Table 8.7.1: Conservation Objectives of the Shiant Isles SPA

Conservation Objectives of the European Site
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.
Further Conservation Objectives: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within the site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species.

The potential for significant effects (in EIA terms) to occur on the ornithological receptor due to the CFIIS has been assessed within the Terrestrial Ecology and Ornithology chapter of the EIA (see Chapter 11: Terrestrial Ecology and Ornithology). Mitigation has been proposed in order to minimise effects to birds, which has ensured that all impacts to ornithological receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the qualifying interests listed in Table 8.7.1, and therefore the Shiant Isles SPA. Further details, including the relevant sections of the EIA are provided in Table 8.7.2.

Table 8.7.2: Qualifying Interests of the Shiant Isles SPA

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding black-legged kittiwake (breeding seabird assemblage)	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.13 • 11.5.5 • 11.5.5.11 • 11.7.1.1.4 • 11.7.1.1.4.2	The Shiant Isles SPA supports 0.4% of the GB population of black-legged kittiwake (1,800 pairs) (SNH, 2009t). Black-legged kittiwake are the most marine species of gull in the UK, which nest on maritime cliffs and ledges (Mousley and Kershaw, 2023). There are no suitable nesting areas for this species in the vicinity of the CFIIS and hence disturbance is not expected for birds actively breeding in the area. Individuals which use the area to forage are expected to be habituated to disturbance in the form of vessel movements and hence will be used to disturbance arising from the construction of the CFIIS. If black-legged kittiwake are disturbed and avoid the area, the avoidance will be small and localised. Therefore, based on the ecology of black-legged kittiwake and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in impacts on black-legged kittiwake distribution and prey availability, nor does it affect the breeding seabird assemblage. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Shiant Isles SPA.

8.8 Mingulay and Berneray SPA

The conservation objectives for the Mingulay and Berneray SPA are shown in Table 8.8.1. An assessment of the potential for adverse effects for each qualifying interest included for the Mingulay and Berneray SPA is shown in Table 8.8.2.

Table 8.8.1: Conservation Objectives of the Mingulay and Berneray SPA

Conservation Objectives of the European Site
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.
Further Conservation Objectives: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within the site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species.

The potential for significant effects (in EIA terms) to occur on the ornithological receptor due to the CFIIS has been assessed within the Terrestrial Ecology and Ornithology chapter of the EIA (see Chapter 11: Terrestrial Ecology and Ornithology). Mitigation has been proposed in order to minimise effects to birds, which has ensured that all impacts to ornithological receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the

qualifying interests listed in Table 8.8.1, and therefore the Mingulay and Berneray SPA. Further details, including the relevant sections of the EIA are provided in Table 8.8.2.

Table 8.8.2: Qualifying Interests of the Mingulay and Berneray SPA

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding black-legged kittiwake (breeding seabird assemblage)	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.14 • 11.5.5 • 11.5.5.11 • 11.7.1.1.4 • 11.7.1.1.4.2	The Mingulay and Berneray SPA supports 2% of the GB population of black-legged kittiwake (8,600 pairs) (SNH, 2009m). Black-legged kittiwake are the most marine species of gull in the UK, which nest on maritime cliffs and ledges (Mousley and Kershaw, 2023). There are no suitable nesting areas for this species in the vicinity of the CFIIS and hence disturbance is not expected for birds actively breeding in the area. Individuals which use the area to forage are expected to be habituated to disturbance in the form of vessel movements and hence will be used to disturbance arising from the construction of the CFIIS. If black-legged kittiwake are disturbed and avoid the area, the avoidance will be small and localised. Therefore, based on the ecology of black-legged kittiwake and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in an impact on black-legged kittiwake distribution and prey availability, nor does it affect the breeding seabird assemblage. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Mingulay and Berneray SPA.

8.9 Ailsa Craig SPA

The conservation objectives for the Ailsa Craig SPA are shown in Table 8.9.1. An assessment of the potential for adverse effects for each qualifying interest included for the Ailsa Craig SPA is shown in Table 8.9.2.

Table 8.9.1: Conservation Objectives of the Ailsa Craig SPA

Conservation Objectives of the European Site
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.
Further Conservation Objectives: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within the site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species.

The potential for significant effects (in EIA terms) to occur on the ornithological receptors due to the CFIIS has been assessed within the Terrestrial Ecology and Ornithology chapter of the EIA (see Chapter 11: Terrestrial Ecology and Ornithology). Mitigation has been proposed in order to minimise effects to birds, which has ensured that all impacts to ornithological

receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the qualifying interests listed in Table 8.9.1, and therefore the Ailsa Craig SPA. Further details, including the relevant sections of the EIA are provided in Table 8.9.2.

Table 8.9.2: Qualifying Interests of the Ailsa Craig SPA

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding black-legged kittiwake (breeding seabird assemblage)	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.15 • 11.5.5 • 11.5.5.11 • 11.7.1.1.4 • 11.7.1.1.4.2	The Ailsa Craig SPA supports 0.6% of the GB population of black-legged kittiwake (3,100 pairs) (SNH, 2009a). Black-legged kittiwake are the most marine species of gull in the UK, which nest on maritime cliffs and ledges (Mousley and Kershaw, 2023). There are no suitable nesting areas for this species in the vicinity of the CFIIS and hence disturbance is not expected for birds actively breeding in the area. Individuals which use the area to forage are expected to be habituated to disturbance in the form of vessel movements and hence will be used to disturbance arising from the construction of the CFIIS. If black-legged kittiwake are disturbed and avoid the area, the avoidance will be small and localised. Therefore, based on the ecology of black-legged kittiwake and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in and impact on black-legged kittiwake distribution and prey availability, nor does it affect the breeding seabird assemblage. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Ailsa Craig SPA.
Breeding lesser black-backed gull	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.15 • 11.5.5 • 11.5.5.12 • 11.7.1.1.4.3 • 11.7.2.1.4.2	The Ailsa Craig SPA supports 1.4% of the *L.f. greallsii* biogeographic population of lesser black-backed gull (1,800 pairs) (SNH, 2009a). Lesser black-backed gull are known to frequent the area of the CFIIS (NBN, 2025). Hence those which already choose to nest or forage within the area of the CFIIS planning boundary will have some level of habituation to disturbance, due to ongoing vessel movements and people. If individuals are displaced during construction, the result would be localised, especially when considering the abundance of available habitat in the immediate area. Therefore, based on the presence of lesser black-backed gull and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in an impact on lesser black-backed gull distribution or disturbance. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Ailsa Craig SPA.

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding Northern gannet	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.15 • 11.5.5 • 11.5.5.6 • 11.7.1.1.4 • 11.7.1.1.4.2	The Ailsa Craig SPA supports 8.7% of the world biogeographic population of Northern gannet (23,000 pairs) (SNH, 2009a). Northern gannet are a strictly marine species which nest on rocky cliffs and islands around the UK (BirdLife International, 2018). There are no suitable nesting areas for this species in the vicinity of the CFIIS and hence disturbance is not expected for birds actively breeding in the area. Individuals which use the area to forage are expected to be habituated to disturbance in the form of vessel movements and hence will be used to disturbance arising from the construction of the CFIIS. If Northern gannet are disturbed and avoid the area, the avoidance will be small and localised. Therefore, based on the ecology of Northern gannet and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in an impact on Northern gannet populations and habitats. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Ailsa Craig SPA.

8.10 Handa SPA

The conservation objectives for the Handa SPA are shown in Table 8.10.1. An assessment of the potential for adverse effects for each qualifying interest included for the Handa SPA is shown in Table 8.10.2.

Table 8.10.1: Conservation Objectives of the Handa SPA

Conservation Objectives of the European Site
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.
Further Conservation Objectives: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within the site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species.

The potential for significant effects (in EIA terms) to occur on the ornithological receptor due to the CFIIS has been assessed within the Terrestrial Ecology and Ornithology chapter of the EIA (see Chapter 11: Terrestrial Ecology and Ornithology). Mitigation has been proposed in order to minimise effects to birds, which has ensured that all impacts to ornithological receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the qualifying interests listed in Table 8.10.1, and therefore the Handa SPA. Further details, including the relevant sections of the EIA are provided in Table 8.10.2.

Table 8.10.2: Qualifying Interests of the Handa SPA

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding black-legged kittiwake (breeding seabird assemblage)	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.16 • 11.5.5 • 11.5.5.11 • 11.7.1.1.4 • 11.7.1.1.4.2	The Handa SPA supports 2.2% of the GB population of black-legged kittiwake (10,732 pairs) (SNH, 2009j). Black-legged kittiwake are the most marine species of gull in the UK, which nest on maritime cliffs and ledges (Mousley and Kershaw, 2023). There are no suitable nesting areas for this species in the vicinity of the CFIIS and hence disturbance is not expected for birds actively breeding in the area. Individuals which use the area to forage are expected to be habituated to disturbance in the form of vessel movements and hence will be used to disturbance arising from the construction of the CFIIS. If black-legged kittiwake are disturbed and avoid the area, the avoidance will be small and localised. Therefore, based on the ecology of black-legged kittiwake and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in impacts on black-legged kittiwake distribution and population, nor does it affect the breeding seabird assemblage. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Handa SPA.

8.11 Seas off St Kilda SPA

The conservation objectives for the Seas off St Kilda SPA are shown in Table 8.11.1. An assessment of the potential for adverse effects for each qualifying interest included for the Seas off St Kilda SPA is shown in Table 8.11.2.

Table 8.11.1: Conservation Objectives of the Seas off St Kilda SPA

Conservation Objectives of the European Site
Overarching Conservation Objective: 1. To ensure that the qualifying features of St Kilda SPA and the Seas off St Kilda SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status; and 2. To ensure that the integrity of St Kilda SPA and the Seas off St Kilda SPA is restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature.
Further Conservation Objectives: 2a. The populations of qualifying features are viable components of St Kilda SPA and Seas off St Kilda SPA; 2b. The distributions of the qualifying features throughout St Kilda SPA and Seas off St Kilda SPA are maintained by avoiding significant disturbance of the species; and 2c. The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained, or where appropriate restored, at St Kilda SPA and/or Seas off St Kilda SPA.

The potential for significant effects (in EIA terms) to occur on the ornithological receptor due to the CFIIS has been assessed within the Terrestrial Ecology and Ornithology chapter of the EIA (see Chapter 11: Terrestrial Ecology and Ornithology). Mitigation has been proposed in

order to minimise effects to birds, which has ensured that all impacts to ornithological receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the qualifying interests listed in Table 8.11.1, and therefore the Seas off St Kilda SPA. Further details, including the relevant sections of the EIA are provided in Table 8.11.2.

Table 8.11.2: Qualifying Interests of the Seas off St Kilda SPA

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding Northern gannet (breeding seabird assemblage)	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.17 • 11.5.5 • 11.5.5.6 • 11.7.1.1.4 • 11.7.1.1.4.2	The Seas off St Kilda SPA supports 5.2% of the biogeographic population of Northern gannet (50,332 individuals) (JNCC, 2020b). Northern gannet are a strictly marine species which nest on rocky cliffs and islands around the UK (BirdLife International, 2018). There are no suitable nesting areas for this species in the vicinity of the CFIIS and hence disturbance is not expected for birds actively breeding in the area. Individuals which use the area to forage are expected to be habituated to disturbance in the form of vessel movements and hence will be used to disturbance arising from the construction of the CFIIS. If Northern gannet are disturbed and avoid the area, the avoidance will be small and localised. Therefore, based on the ecology of Northern gannet and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in impacts on Northern gannet habitat and distribution, nor does it affect the breeding seabird assemblage. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Seas off St Kilda SPA.

8.12 Flannan Isles SPA

The conservation objectives for the Flannan Isles SPA are shown in Table 8.12.1. An assessment of the potential for adverse effects for each qualifying interest included for the Flannan Isles SPA is shown in Table 8.12.2.

Table 8.12.1: Conservation Objectives of the Flannan Isles SPA

Conservation Objectives of the European Site
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.
Further Conservation Objectives: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within the site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and

Conservation Objectives of the European Site
• No significant disturbance of the species.

The potential for significant effects (in EIA terms) to occur on the ornithological receptor due to the CFIIS has been assessed within the Terrestrial Ecology and Ornithology chapter of the EIA (see Chapter 11: Terrestrial Ecology and Ornithology). Mitigation has been proposed in order to minimise effects to birds, which has ensured that all impacts to ornithological receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the qualifying interests listed in Table 8.12.1, and therefore the Flannan Isles SPA. Further details, including the relevant sections of the EIA are provided in Table 8.12.2.

Table 8.12.2: Qualifying Interests of the Flannan Isles SPA

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding black-legged kittiwake (breeding seabird assemblage)	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.18 • 11.5.5 • 11.5.5.11 • 11.7.1.1.4 • 11.7.1.1.4.2	The Flannan Isles SPA supports 0.6% of the GB population of black-legged kittiwake (2,780 pairs) (SNH, 2009g). Black-legged kittiwake are the most marine species of gull in the UK, which nest on maritime cliffs and ledges (Mousley and Kershaw, 2023). There are no suitable nesting areas for this species in the vicinity of the CFIIS and hence disturbance is not expected for birds actively breeding in the area. Individuals which use the area to forage are expected to be habituated to disturbance in the form of vessel movements and hence will be used to disturbance arising from the construction of the CFIIS. If black-legged kittiwake are disturbed and avoid the area, the avoidance will be small and localised. Therefore, based on the ecology of black-legged kittiwake and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in impacts on black-legged kittiwake population and distribution, nor does it affect the breeding seabird assemblage. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Flannan Isles SPA.

8.13 St Kilda SPA

The conservation objectives for the St Kilda SPA are shown in Table 8.13.1. An assessment of the potential for adverse effects for each qualifying interest included for the St Kilda is shown in Table 8.13.2.

Table 8.13.1: Conservation Objectives of the St Kilda SPA

Conservation Objectives of the European Site
Overarching Conservation Objective: 1. To ensure that the qualifying features of St Kilda SPA and the Seas off St Kilda SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status; and 2. To ensure that the integrity of St Kilda SPA and the Seas off St Kilda SPA is restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature.

Conservation Objectives of the European Site
Further Conservation Objectives: 2a. The populations of qualifying features are viable components of St Kilda SPA and Seas off St Kilda SPA; 2b. The distributions of the qualifying features throughout St Kilda SPA and Seas off St Kilda SPA are maintained by avoiding significant disturbance of the species; and 2c. The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained, or where appropriate restored, at St Kilda SPA and/or Seas off St Kilda SPA.

The potential for significant effects (in EIA terms) to occur on the ornithological receptors due to the CFIIS has been assessed within the Terrestrial Ecology and Ornithology chapter of the EIA (see Chapter 11: Terrestrial Ecology and Ornithology). Mitigation has been proposed in order to minimise effects to birds, which has ensured that all impacts to ornithological receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the qualifying interests listed in Table 8.13.1, and therefore the St Kilda SPA. Further details, including the relevant sections of the EIA are provided in Table 8.13.2.

Table 8.13.2: Qualifying Interests of the St Kilda SPA

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding Northern gannet (breeding seabird assemblage)	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.19 • 11.5.5 • 11.5.5.6 • 11.7.1.1.4 • 11.7.1.1.4.2	The St Kilda SPA supports 19% of the world biogeographic population of Northern gannet (50,050 pairs) (SNH, 2009q). Northern gannet are a strictly marine species which nest on rocky cliffs and islands around the UK (BirdLife International, 2018). There are no suitable nesting areas for this species in the vicinity of the CFIIS and hence disturbance is not expected for birds actively breeding in the area. Individuals which use the area to forage are expected to be habituated to disturbance in the form of vessel movements and hence will be used to disturbance arising from the construction of the CFIIS. If Northern gannet are disturbed and avoid the area, the avoidance will be small and localised. Therefore, based on the ecology of Northern gannet and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in impacts on Northern gannet habitat and distribution, nor does it affect the breeding seabird assemblage. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the St Kilda SPA.

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding black-legged kittiwake (breeding seabird assemblage)	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.19 • 11.5.5 • 11.5.5.11 • 11.7.1.1.4 • 11.7.1.1.4.2	The St Kilda SPA supports 2% of the GB population of black-legged kittiwake (7,830 pairs) (SNH, 2009q). Black-legged kittiwake are the most marine species of gull in the UK, which nest on maritime cliffs and ledges (Mousley and Kershaw, 2023). There are no suitable nesting areas for this species in the vicinity of the CFIIS and hence disturbance is not expected for birds actively breeding in the area. Individuals which use the area to forage are expected to be habituated to disturbance in the form of vessel movements and hence will be used to disturbance arising from the construction of the CFIIS. If black-legged kittiwake are disturbed and avoid the area, the avoidance will be small and localised. Therefore, based on the ecology of black-legged kittiwake and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in impacts on black-legged kittiwake distribution and prey availability, nor does it affect the breeding seabird assemblage. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the St Kilda SPA.

8.14 Sule Skerry and Sule Stack SPA

The conservation objectives for the Sule Skerry and Sule Stack SPA are shown in Table 8.14.1. An assessment of the potential for adverse effects for each qualifying interest included for the Sule Skerry and Sule Stack SPA is shown in Table 8.14.2.

Table 8.14.1: Conservation Objectives of the Sule Skerry and Sule Stack SPA

Conservation Objectives of the European Site
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.
Further Conservation Objectives: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within the site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species.

The potential for significant effects (in EIA terms) to occur on the ornithological receptor due to the CFIIS has been assessed within the Terrestrial Ecology and Ornithology chapter of the EIA (see Chapter 11: Terrestrial Ecology and Ornithology). Mitigation has been proposed in order to minimise effects to birds, which has ensured that all impacts to ornithological receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the

qualifying interests listed in Table 8.14.1, and therefore the Sule Skerry and Sule Stack SPA. Further details, including the relevant sections of the EIA are provided in Table 8.14.2.

Table 8.14.2: Qualifying Interests of the Sule Skerry and Sule Stack SPA

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding Northern gannet (breeding seabird assemblage)	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.20 • 11.5.5 • 11.5.5.6 • 11.7.1.1.4 • 11.7.1.1.4.2	The Sule Skerry and Sule Stack SPA supports 2.2% of the world biogeographic population of Northern gannet (5,900 pairs) (SNH, 2009r). Northern gannet are a strictly marine species which nest on rocky cliffs and islands around the UK (BirdLife International, 2018). There are no suitable nesting areas for this species in the vicinity of the CFIIS and hence disturbance is not expected for birds actively breeding in the area. Individuals which use the area to forage are expected to be habituated to disturbance in the form of vessel movements and hence will be used to disturbance arising from the construction of the CFIIS. If Northern gannet are disturbed and avoid the area, the avoidance will be small and localised. Therefore, based on the ecology of Northern gannet and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in impacts on Northern gannet population or distribution, nor does it affect the breeding seabird assemblage. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Sule Skerry and Sule Stack SPA.

8.15 North Rona and Sula Sgeir SPA

The conservation objectives for the North Rona and Sula Sgeir SPA are shown in Table 8.15.1. An assessment of the potential for adverse effects for each qualifying interest included for the North Rona and Sula Sgeir SPA is shown in Table 8.15.2.

Table 8.15.1: Conservation Objectives of the North Rona and Sula Sgeir SPA

Conservation Objectives of the European Site
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.
Further Conservation Objectives: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within the site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species.

The potential for significant effects (in EIA terms) to occur on the ornithological receptor due to the CFIIS has been assessed within the Terrestrial Ecology and Ornithology chapter of the EIA (see Chapter 11: Terrestrial Ecology and Ornithology). Mitigation has been proposed in

order to minimise effects to birds, which has ensured that all impacts to ornithological receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the qualifying interests listed in Table 8.15.1, and therefore the North Rona and Sula Sgeir SPA. Further details, including the relevant sections of the EIA are provided in Table 8.15.2.

Table 8.15.2: Qualifying Interests of the North Rona and Sula Sgeir SPA

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding Northern gannet (breeding seabird assemblage)	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.21 • 11.5.5 • 11.5.5.6 • 11.7.1.1.4 • 11.7.1.1.4.2	The North Rona and Sula Sgeir SPA supports 4% of the North Atlantic biogeographic population of Northern gannet (10,400 pairs) (SNH, 2009n). Northern gannet are a strictly marine species which nest on rocky cliffs and islands around the UK (BirdLife International, 2018). There are no suitable nesting areas for this species in the vicinity of the CFIIS and hence disturbance is not expected for birds actively breeding in the area. Individuals which use the area to forage are expected to be habituated to disturbance in the form of vessel movements and hence will be used to disturbance arising from the construction of the CFIIS. If Northern gannet are disturbed and avoid the area, the avoidance will be small and localised. Therefore, based on the ecology of Northern gannet and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in impacts on Northern gannet population and disturbance, nor does it affect the breeding seabird assemblage. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the North Rona and Sula Sgeir SPA.

8.16 Noss SPA

The conservation objectives for the Noss SPA are shown in Table 8.16.1. An assessment of the potential for adverse effects for each qualifying interest included for the Noss SPA is shown in Table 8.16.2.

Table 8.16.1: Conservation Objectives of the Noss SPA

Conservation Objectives of the European Site
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.
Further Conservation Objectives: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within the site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species.

The potential for significant effects (in EIA terms) to occur on the ornithological receptor due to the CFIIS has been assessed within the Terrestrial Ecology and Ornithology chapter of the EIA (see Chapter 11: Terrestrial Ecology and Ornithology). Mitigation has been proposed in order to minimise effects to birds, which has ensured that all impacts to ornithological receptors are **non-significant**. Hence, providing the mitigation detailed within the EIA is implemented, **no adverse effects** would be anticipated to the conservation objectives for the qualifying interests listed in Table 8.16.1, and therefore the Noss SPA. Further details, including the relevant sections of the EIA are provided in Table 8.16.2.

Table 8.16.2: Qualifying Interests of the Noss SPA

Qualifying Interest	Relevant EIAR Sections	Summary of Assessment
Breeding Northern gannet (breeding seabird assemblage)	Chapter 11: Terrestrial Ecology and Ornithology: • 11.5.1 • 11.5.1.22 • 11.5.5 • 11.5.5.6 • 11.7.1.1.4 • 11.7.1.1.4.2	The Noss SPA supports 3% of the western European breeding population of Northern gannet (6,860 pairs) (SNH, 2009o). Northern gannet are a strictly marine species which nest on rocky cliffs and islands around the UK (BirdLife International, 2018). There are no suitable nesting areas for this species in the vicinity of the CFIIS and hence disturbance is not expected for birds actively breeding in the area. Individuals which use the area to forage are expected to be habituated to disturbance in the form of vessel movements and hence will be used to disturbance arising from the construction of the CFIIS. If Northern gannet are disturbed and avoid the area, the avoidance will be small and localised. Therefore, based on the ecology of Northern gannet and the presumed habituation to current disturbance levels the construction of the CFIIS would not result in impacts on Northern gannet distribution and disturbance, nor does it affect the breeding seabird assemblage. Furthermore, there is not expected to be any adverse effects to the conservation objectives of the Noss SPA.

9 Cumulative Effects

Cumulative effects of four projects which could affect qualifying interests identified as having LSE were identified in Chapters 3: Methodology, 11: Terrestrial Ecology and Ornithology and 12: Marine Mammals of the EIAR, including:

For ornithological qualifying interests:

- Glen Gour Hydro Scheme.

For marine mammal qualifying interests:

- Hunterston Construction Yard Upgrade; and
- Govan Land Reclamation.

Following assessment, no significant effects are anticipated on any of the qualifying interests identified as having LSE, as detailed in the following sections.

9.1 Ornithology

The Glen Gour Hydro Scheme would affect the territory of a resident breeding pair of golden eagles that regularly success in raising a chick. As breeding success is linked to prey availability, the potential for resource deprivation was considered. However, due to the regularity of successful chick rearing, it was assumed that prey availability in the territory was good and, therefore, less sensitivity to small losses of habitat. Since the area of the CFIIS is not suitable for golden eagle and that no significant effects are expected, there are also no cumulative impacts of this hydro scheme.

9.2 Marine Mammals

The Hunterston Construction Yard Upgrade (110km away) and Govan Land Reclamation (112km away) were considered for the cumulative effects of pilling during the construction phase of the CFIIS. However, since the proposed mitigation measures for the CFIIS reduce any significant effects to non-significant, the cumulative effect of these developments is also considered to be non-significant.

10 Conclusion

The European Sites and associated qualifying interests that have LSE due to the CFIIS have been considered, within this document and the EIAR.

Taking into account mitigation outlined within Chapter 21: Schedule of Mitigation of the EIA, it was determined that impacts on any qualifying interests associated with European Sites would not be of the magnitude that would be likely to result in adverse effects on any conservation objectives of any European Sites. It is the responsibility of Marine Directorate to carry out an AA to confirm whether the CFIIS will give rise to any adverse effects on European Sites. Hence, appropriate information to allow the AA to be undertaken has been provided in the EIA chapters, sign posting the relevant sections has been provided in this document to facilitate the assessment.

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12 Glossary

Acronym	Definition
AA	Appropriate Assessment
BTO	British Trust for Ornithology
CFIIS	Corran Ferry Infrastructure Improvement Scheme
cSAC	Candidate Special Area of Conservation
E	East
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ENE	East-North-East
EOMS	European Offshore Marine Sites
ESE	East-South-East
EU	European Union
GB	Great Britain
GPS	Global Positioning System
ha	Hectares
HRA	Habitats Regulations Appraisal
IAMMWG	Inter-Agency Marine Mammal Working Group
JNCC	Joint Nature Conservation Committee
km	Kilometres
km^2	Square Kilometres
LSE	Likely Significant Effect
m	Metres
m/s	Meters/Second
MHWS	Mean High Water Springs
MPA(NC)	Nature Conservation Marine Protected Area
NBN	National Biodiversity Network
NE	North-East
NMPi	National Marine Plan Interactive
NNE	North-North-East
NNR	National Nature Reserve
NW	North-West
pSAC	Proposed Special Protection Area
pSPA	Proposed Special Area of Conservation
S	South
SAC	Special Area of Conservation
SCOS	Special Committee on Seals
SE	South-East
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SSE	South-South-East
SSSI	Site Of Special Scientific Interest
SSW	South-South-West
SW	South-West
THC	The Highland Council
UK	United Kingdom
W	West
WNW	West-North-West

Appendix 1: Recommended Foraging Ranges for Assessing Ecological Connectivity

Table A1.1: Recommended Foraging Ranges of Ornithological Qualifying Interests Assessed in the HRA (SNH, 2016; NatureScot, 2023a)

Species	Recommended Foraging Range (km)	Metric
Golden eagle	Core range – 6, Maximum range – 9	Not Specified
Peregrine	Core range – 2, Maximum range – 18	Not Specified
Greenland barnacle goose	Core range – 15, Maximum recorded distance – 25	Not Specified
Common eider	21.5	Mean Maximum
Red-throated diver	9	Maximum/Mean Maximum
European storm petrel	336	Maximum/Mean Maximum
Leach's storm petrel	657	Mean
Northern fulmar	1200.2	Mean Maximum + Standard Deviation
Manx shearwater	2365.5	Mean Maximum + Standard Deviation
Northern gannet	509.4	Mean Maximum + Standard Deviation
European shag	23.7	Mean Maximum + Standard Deviation
Cormorant	33.9	Mean Maximum + Standard Deviation
Black-legged kittiwake	300.6	Mean Maximum + Standard Deviation
Black-headed gull	18.5	Maximum/Mean Maximum
Common gull	50	Maximum/Mean Maximum
Great black-backed gull	73	Maximum/Mean Maximum
Herring gull	85.6	Mean Maximum + Standard Deviation
Lesser black-backed gull	236	Mean Maximum + Standard Deviation
Sandwich tern	57.5	Mean Maximum + Standard Deviation
Roseate tern	23.2	Mean Maximum + Standard Deviation
Common tern	26.9	Mean Maximum + Standard Deviation
Arctic tern	40.5	Mean Maximum + Standard Deviation
Great skua	931.2	Mean Maximum + Standard Deviation
Arctic skua	2.7	Mean + Standard Deviation
Common guillemot (excluding data from Fair Isle)	95.2	Mean Maximum + Standard Deviation
Razorbill	122.2	Mean Maximum + Standard Deviation
Atlantic Puffin	265.4	Mean Maximum + Standard Deviation

Corran Ferry Infrastructure Improvement Scheme

Appendix K.1: Preliminary Ecological Appraisal Report

Wallace Stone
Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

Corran Ferry

Infrastructure Improvement Scheme

Preliminary Ecological Appraisal Report

Report No: 99_REP_05

Date: 06/09/2022

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Executive Summary

Affric Limited have undertaken a Preliminary Ecological Appraisal (PEA) of the land surrounding the existing ferry terminals at Ardgour and Nether Lochaber, either side of the Corran Narrows in Loch Linnhe, south of Fort William. The survey was undertaken to help inform the suitability of proposed locations for development works associated with the Corran Ferry Infrastructure Improvement Scheme (CFIIS) by outlining potential ecological constraints to development by providing baseline information on the ecological nature of the Survey Area and recommendations on further ecological survey work (if required). The PEA was undertaken by suitably qualified ecologists, Ffion Maguire and Texa Sim, on 23rd August 2022.

The site is situated within 5km of five designated sites, including Onich to North Ballachulish Woods and Shore Site of Special Scientific Interest (SSSI), Onich to North Ballachulish Special Area of Conservation (SAC), Moidart and Ardgour Special Protection Area (SPA), Glen Etive and Glen Fyne SPA and Kentallen SSSI. Habitats within the Survey Area are not considered to be an extension of the designates sites, however, may provide connective habitat for protected species in the wider locality. Both Moidart and Ardgour SPA and Glen Etive and Glen Fyne SPA are protected due to the presence of Golden Eagle (*Aquila chrysaetos*). However, the Survey Area was considered to be sub-optimal for the species due to the sub-urban nature of the site and subsequent disturbance and lack of suitable resources.

The Survey Area has been divided into four zones (Zone 1, 2, 3 and 4). Zones 1 – 3 are situated on the eastern bank of Loch Linnhe. Zone 4 is situated on the western bank of the loch. The Survey Area supports a range of habitats typical of a sub-urban coastal area, including buildings, amenity grassland, broadleaved woodland, coniferous woodland, scrub and heathland. The land surrounding the Survey Area is predominantly comprised of coniferous woodland, heathland, grazing pasture and hard infrastructure.

The broadleaved woodland situated in Zone 1 and the small pockets of coniferous and broadleaved woodland in Zones 2 and 3 have potential suitability for bats, Badger (*Meles meles*), Red squirrel (*Sciurus vulgaris*) and Pine marten (*Martes martes*). Therefore, if works are proposed within these Zones, further species-specific surveys will be required.

Breeding Bird Surveys were undertaken by Atmos Consulting Limited in the summer of 2022 to determine potential ecological constraints in relation to ornithology. Thus, although this report contains comment on birds identified within the Survey Area, the Breeding Bird Survey Report should be referred to for recommendations in relation to ornithology.

Rhododendron (*Rhododendron ponticum*) and Japanese Knotweed (*Fallopia japonica*) were identified within the Survey Area. Both species are Invasive Non-Native Species (INNS) listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). If construction works encroach upon areas supporting invasive species, INNS Management Plans (INNSMP) will be required. Extensive Rhododendron clearance has recently been undertaken within Zone 3. As such, the current habitat predominantly comprised of cleared vegetation. The clearance of invasive species is likely to have a positive impact upon the habitat by promoting the growth of native species. If construction works are to take place within Zone 3, there may be a need to re-survey the area. Habitats within Zone 3 are known to support Lesser butterfly-orchid (*Platanthera bifolia*), a UK Biodiversity Action Plan (BAP) protected species. Lesser butterfly-orchid was not identified during the Extended Phase 1 Habitat Survey, however, a National

Vegetation Classification (NVC) Survey of Zone 3 would be advisable if it is to be included within the proposed design.

1 Introduction

Affric Limited have undertaken a Preliminary Ecological Appraisal (PEA) of the land surrounding the existing ferry terminals at Ardgour and Nether Lochaber, either side of the Corran Narrows in Loch Linnhe, south of Fort William. The purpose of the survey was to help inform the suitability of proposed locations for development works associated with the Corran Ferry Infrastructure Improvement Scheme (CFIIS) by providing baseline information on the ecological nature of the Survey Area and identifying potential ecological constraints to development.

For the purpose of this report, the 'Survey Area' includes the land situated within the blue line boundary (Drawing 99_DRG_02_01). The Survey Area covers in the region of 20ha, which includes land on both the eastern and western banks of Loch Linnhe. The Survey Area has been split into four Zones (Zones 1, 2, 3 and 4), in order to help identify specific areas requiring further survey work. Survey Zones are shown in Drawing 99_DRG_02_1.

1.1 Objectives of Study

The purpose of the Preliminary Ecological Appraisal Report (PEAR) is to establish the baseline ecological conditions of the Survey Area and inform of potential ecological constraints to development by undertaking an Extended Phase 1 Habitat Survey and desktop study.

This report will detail the following:

- Desk study results;
- Field survey methodology;
- Field survey results; and
- Recommendations for further survey (if required).

1.2 Survey Area Description

The Survey Area runs alongside either side of Loch Linnhe, through the villages of Nether Lochaber and Ardgour. As such, much of the surrounding area incorporates habitats and infrastructure associated with a coastal village. A large part of the Survey Area is part of the sub-urban landscape, comprised of residential and commercial buildings with associated hard and soft landscaping. However, areas of woodland, grassland, scrub and heathland remain. Rhododendron (*Rhododendron ponticum)* has become a significant problem within the local area, dominating much of the existing habitats.

1.3 Proposed Works

The Highland Council (THC) are proposing to upgrade the existing ferry terminals at Corran. The upgrade will involve the replacement of the existing ferry with two electric vessels requiring installation of infrastructure to support their use, including a new slipway at Ardgour and Nether-Lochaber, marshalling areas, public facilities, and a berthing pier. The development will involve both marine construction and dredging works below Mean High Water Springs (MHWS), as well as construction works above Mean Low Water Springs (MLWS). Several designs are proposed. The PEAR will help assist design selection by informing the suitability of proposed locations for development works associated with the CFIIS.

2 Methodology

2.1 Study Area

The Survey Area covers around 20ha of land along the western and eastern banks of Loch Linnhe. As the PEAR was undertaken to inform optioneering. The Survey Area was comprised of four Zones (Zones 1, 2, 3 and 4) which were chosen with the various design proposals in mind and were comprised of potential construction zones with an buffer deemed appropriate for the ecological nature and landscape of the site. The desktop study was extended to include a 5km buffer from the Survey Area in order to properly assess local records of species populations which may utilise the wider habitat mosaic.

2.2 Desktop Study

A data collection exercise was undertaken to provide additional contextual ecological information of the site.

Ecological background information of the survey area and 5km buffer was obtained from a variety of sources. Information of designated sites was obtained from DEFRA via MAGIC Map (DEFRA, 2022) and NatureScot via SiteLink (NatureScot, 2022). A review of information available on the National Biodiversity Network (NBN) Atlas (NBN, 2022) was undertaken to obtain information on local records of protected species. Aerial photography from Google Maps (Google, 2022) was also utilised.

2.3 Extended Phase 1 Habitat Survey

An Extended Phase 1 Habitat Survey was undertaken by suitably qualified ecologists, Ffion Maguire and Texa Sim on 23rd August 2022 following the guidance of CIEEM's Guidelines for Baseline Ecological Assessment (CIEEM, 2017). The Extended Phase 1 Habitat Survey was undertaken across the entirety of the Survey Area. The survey should not be considered to be representative of a full protected species or botanical survey but a baseline survey to provide an overview of the ecology of the site to help inform upon the need for further survey work (if required).

Phase 1, as described in JNCC's Handbook for Phase 1 Habitat Survey, a Technique for Environmental Audit (JNCC, 2010), is considered to be a standardised method of assessing and recording habitat types. Habitats within the Survey Area were mapped on-site. Where required, descriptive 'Target Notes' were recorded for features of ecological interest (Appendix 2). A Site Habitat Map was produced using Quantum Geographic Information System (QGIS) software.

The Extended Phase 1 Habitat Survey included a preliminary survey of the site's suitability to support protected species. In order to assess the site's suitability for protected species, species-specific best practice guidelines were followed.

2.4 Limitations

The survey was undertaken during heavy rain. The heavy rain caused much of the rocky coastline to become inaccessible due to risk of slipping. However, as the habitat was situated below the high tide mark, access was not required as part of the terrestrial Extended Phase 1 Habitat Survey. There were access limitations within the woodland and heathland due to dense ground flora, although it was still possible to suitably map the habitats. Some locations within the Survey Area could not be accessed due to constraints of land ownership. However, this

land was part of residential plots, and as such will not be impacted as part of development. Residential plots comprised of residential dwellings, outbuildings, mown gardens and introduced shrub were mapped as 'buildings'. The site survey was undertaken during August, which is considered to be an appropriate time to complete a Phase 1 Habitat Survey. On the other hand, August is considered to be sub-optimal for the survey of certain species, such as Badger (*Meles meles*).

3 Results

3.1 Desktop Study

3.1.1 Statutory Designated Sites

A review of SiteLink and MAGIC Maps confirmed that there are several designated sites within 5km of the Survey Area (Table 3.1).

Table 3.1.1: Summary of Designated Sites within 5km of the Survey Area

Designated Site	Approximate distance from Survey Area	Ecological Features of Importance	Comments
Onich to North Ballachulish Woods and Shore SSSI	0.5km SE	Structural and metamorphic geology; calcium-rich spring water-fed fens; upland mixed ash woodland; and upland oak woodland	The site supports semi-natural woodland, unusual mire communities and Dalradian rocks. The woods are of ecological interest both for their extent and for the variation in structure and flora
Onich to North Ballachulish SAC	0.5km SE	Old Sessile oak (*Quercus petraea*) woods with Ilex and Blechnum with smaller areas of alkaline fens and Tilio-Acerion forests	The site supports three Annex I habitats, including 91A0 old Sessile oak woods with Ilex and Blechnum; 7230 Alkaline fens and 9180 Tilio-Acerion forests
Moidart and Ardgour SPA	1km NW	Regularly supports a population of Golden eagle (*Aquila chrysaetos*)	In 2003, 11 territories of Golden eagle were recorded, which is more than 2.4% of the GB population
Glen Etive and Glen Fyne SPA	4km SSE	Regularly supports a population of Golden eagle (*Aquila chrysaetos*)	In 2003, 19 territories of Golden eagle were recorded, which is more than 4.2% of the GB population
Kentallen SSSI	5km SSW	Geological SSSI	No further information available

3.1.2 Non-statutory Designated Sites

There are no known non-statutory designated sites within 5km of the Survey Area.

3.1.3 Protected Species Records

A review of existing species records on NBN Atlas indicates that there are records of protected within the Survey Area and 5km buffer. An overview of herptiles (amphibians and reptiles) and

protected terrestrial mammals recorded within 500m of the Survey Area and Red Birds of Conservation Concern (BoCC) and protected invertebrate species recorded within the Survey Area is shown in Table 3.2.

Table 3.1.2: Overview of species records

Group	Common name	Scientific name
Amphibians	Common frog	*Rana temporaria*
Birds	Common bullfinch	*Pyrrhula pyrrhula*
	Common cuckoo	*Cuculys canorus*
	Dunlin	*Calidris alpina*
	Eurasian curlew	*Numenius arquata*
	Herring gull	*Larus argentatus*
	House sparrow	*Passer domesticus*
	Kittiwake	*Rissa tridactyla*
	Long-tailed tit	*Aegithalos caudatus*
	Mistle thrush	*Turdus viscivorus*
	Ringed plover	*Charadrius hiaticula*
	Shag	*Phalacrocorax aristotelis*
	Song thrush	*Turdus philomelos*
	Starling	*Sturnus vulgaris*
	Whinchat	*Saxicola rubetra*
	Wood warbler	*Phylloscopus sibilatrix*
Reptiles	Common lizard	*Zootoca vivipara*
	Slow-worm	*Anguis fragilis*
Terrestrial mammals (excl. bats)	Eurasian otter	*Lutra lutra*
	Eurasia red squirrel	*Sciurus vulgaris*
	Pine marten	*Martes martes*
Invertebrates - bees	Moss carder-bee	*Bombus muscorum subsp. celtibus*

3.1.4 Invasive Species Records

Japanese knotweed (*Fallopia japonica*) and Himalayan balsam (*Impatiens glandulifera*) have been previously recorded within Zone 4, on the western banks of Loch Linnhe. Both species are listed as invasive under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

3.2 Extended Phase 1 Habitat Survey

3.2.1 Habitats

The Survey Area was comprised of habitats associated with a coastal village in the Scottish Highlands. Much of the Survey Area was developed with residential and commercial plots. However, the Survey Area also supports semi-natural habitats such as woodland and heathland. The areas of habitat types identified within each of the four zones is provided in Table 3.3. A description of habitats present within the Survey Area is shown in Table 3.4. A Site Habitat Map has been produced using QGIS to provide a visual representation of the habitats present within the Survey Area (Drawing 99_DRG_02_1).

Table 3.3: Approximate Area of Each Habitat Type (as Described in JNCC, 2010), Identified within the Four Survey Zones

Habitat Type	Approximate Area within Zone 1	Approximate Area within Zone 2	Approximate Area within Zone 3	Approximate Area within Zone 4
Semi-natural broadleaved woodland	0.023km^2	0.005km^2	0.006km^2	N/A
Semi-natural coniferous woodland	N/A	0.003km^2	0.001km^2	N/A
Planted coniferous woodland	N/A	N/A	N/A	0.001km^2
Dense/continuous scrub	N/A	N/A	N/A	0.003km^2
Improved grassland	N/A	<0.001km^2	0.003km^2	0.001km^2
Poor semi-improved grassland	N/A	N/A	N/A	0.003km^2
Amenity grassland	N/A	0.003km^2	N/A	N/A
Introduced shrub	N/A	0.001km^2	0.024km^2	N/A
Buildings	N/A	0.022km^2	0.002km^2	0.018km^2
Other habitat	N/A	N/A	0.057km^2	N/A

Table 3.4: Overview Habitats Present within the Survey Area

Habitat code	Habitat	Description
A1.1.1	Semi-natural broadleaved woodland	Zone 1 is predominantly comprised of semi-natural broadleaved woodland. The majority of the woodland is dominated by stands of Silver birch (*Fagus sylvatica*) of forest growth form, with a low abundance of Alder (*Alnus glutinosa*), Rowan (*Sorbus aucuparia*), Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*), Wild cherry (*Prunus avium*) and Scots pine (*Pinus sylvestris*). In these areas, patches of Bracken (*Pteridium spp.*) and Bramble (*Rubus fruticosus*) dominate the understorey. A patch of Japanese Knotweed (*Fallopia japonica*) is present within the woodland and appears to be spreading westwards. Rhododendron (*Rhododendron ponticum*) is also present. In areas of the woodland where the ground becomes wetter due to small fens, Alder dominates. In these areas there is a decrease in the abundance of Bracken and Bramble, as Soft rush (*Juncus effusus*) takes precedence. Small patches of semi-natural broadleaved woodland are also present in Zones 2 and 3, though these were inaccessible due to dense scrub. However, the woodlands appeared to be dominated by Silver birch with an understorey dominated by Bramble.
A1.2.1	Semi-natural coniferous woodland	A small area of coniferous woodland is present in Zone 2. The woodland canopy isa monoculture of Scots Pine (*Pinus sylvestris*). The ground vegetation appears to be dominated by dense Rhododendron (*Rhododendron ponticum*) scrub, which limited accessibility to survey.
A1.3.2	Planted mixed woodland	Small linear feature dominated by Cherry laurel (*Prunus laurocerasus*) separating the residential plots in Zone 4 from grazing pasture at the rear.
A2.1	Continuous scrub	Linear feature of dense scrub situated in Zone 4 upon the western banks above the A861. Scrub dominated by Gorse (*Ulex spp.*), Bramble (*Rubus fruticosus*) and Rhododendron (*Rhododendron ponticum*). Young/semi-mature Rowan (*Sorbus* aucuparia) and Scots Pine (*Pinus sylvestris*) also present.

Habitat code	Habitat	Description
B4	Improved grassland	Equine grazing pasture in Zone 3 was inaccessible due to land ownership. Appeared to be dominated by Ryegrass (*Lolium spp.*). The grass sward was heavily grazed and showed indication of improvement. Sheep grazing pasture situated towards the west of Zone 4. Dominated by Ryegrass (*Lolium spp.*) and White clover (*Trifolium repens*), with a low abundance of Buttercup (*Ranunculus spp.*), and Dandelion (*Taraxacum officinale*). Small patches of tall herb, Thistle (*Cirsium spp.*) and large patches of Rush (*Juncus effusus*) are present.
B6	Poor semi-improved grassland	Patches of poor semi-improved grassland situated between residential and commercial plots and hard infrastructure within Zone 4. Grassland is relatively patchy. However, covers <75% of the ground. Low species diversity.
D1 & J1.4 matrix	Dry dwarf shrub heath, introduced shrub matrix	Dry upland dwarf heath dominated by Heather (*Calluna spp.*) and Gorse (*Ulex spp.*) that has become heavily encroached by dense patches of Rhododendron (*Rhododendron ponticum*) scrub situated towards the southwest of Zone 3.
J1.2	Amenity grassland	Area of amenity grassland to the north of the eastern ferry terminal in Zone 2. Species identification limited due to heavy mowing. Grassland appears to be dominated by Ryegrass (*Lolium spp.*) and White clover (*Trifolium repens*)
J5	Cleared introduced shrub (other habitat)	Area of recently cleared Rhododendron (*Rhododendron ponticum*) scrub, situated towards the southeast of Zone 3.
J6	Buildings	Residential plots, comprised of buildings with associated hard and soft landscaping, commercial buildings and hard infrastructure are present on both the western and eastern banks of Loch Linnhe (Zones 1, 2, 3 and 4).

3.2.2 Protected Species

3.2.2.1 Amphibians

No freshwater standing waterbodies have been formerly mapped within 250m of Zones 1, 2 or 3. Nonetheless, woodland, grassland and heathland habitats within the Survey Area provide suitable terrestrial habitats to support amphibians. As smaller, unmapped waterbodies may provide suitable breeding habitat for amphibians, it is recommended that Zones 1, 2 and 3 be considered suitable to support common and widespread amphibians as a precautionary approach.

Two lochans are present within 250m of Zone 4. The lochans are part of a larger habitat mosaic of standing waterbodies, grassland and heathland which likely support metapopulations of

common and widespread amphibian species. There are records of Common Frog (*Rana temporaria*) and Common Toad within 5km of the Survey Area. Residential plots and grassland within Zone 4 provide some suitability for amphibians and may be used as 'steppingstone' habitat whilst commuting.

Ultimately the entirety of the Survey Area was considered to have suitability to support populations of common and widespread amphibian species such as Common Frog.

3.2.2.2 Bats

A scoping survey was undertaken concurrently to the PEA to determine suitable habitats on-site for roosting bats which may require a Preliminary Bat Roost Assessment (PRA). Several woodland blocks were identified within Zones 1, 2 and 3. This included a large woodland block dominated by Silver birch (*Betula pendula*) which made up the majority of Zone 1, a small block of native coniferous woodland dominated by Scots pine (*Pinus sylvestris*) to the rear of the existing toilet block in Zone 2, and some small pockets of Silver birch dominated broadleaved woodland within Zones 2 and 3. The woodland blocks were all considered to have suitability for roosting bats. Although no specific Potential Roosting Features (PRF) were identified during the initial scoping survey, it was acknowledged that the woodlands provided features of old growth often associated with roosting bats. As such, the woodlands were perceived to have suitability for roosting bats as a precautionary approach (trees should be inspected on a tree-by-tree basis once proposal designs are complete). Common pipistrelle (*Pipistrellus pipistrellus*) and Soprano pipistrelle (*Pipistrellus pygmaeus*) have been recorded within 5km of the Survey Area. Both are crevice dwelling bat species that may use small PRFs within the trees on-site for roosting. It was identified that there were constraints to a ground-level inspection due to the density of the canopy and ground vegetation. Thus, it is likely that a climbed inspection will be required during further survey work.

Built structures within the Survey Area predominantly comprised of in-use residential and commercial buildings. If works are proposed to any existing built structure as part of the proposed development, a PRA of the built structure will be required.

The entirety of the Survey Area was also surveyed for suitability for foraging/commuting bats. The Survey Area is comprised of a matrix of invertebrate-rich habitats suitable for bat foraging, including grassland, heathland, scrub woodland, residential plots and Loch Linnhe. The Survey Area is surrounded by a range of high-quality habitats, particularly native coniferous woodland. Therefore, suitability for foraging/commuting bats was considered to be high.

3.2.2.3 Birds

The Survey Area supports several habitat types which are considered to be suitable for the associated bird species, including broadleaved woodland, coniferous woodland, heathland, amenity grassland and coastal margins. The potential for the proposals to impact upon protected bird species has already been identified early on in the planning process. As such, a Breeding Bird Survey was carried out by Atmos Consulting Limited in the summer of 2022. The survey report should be referenced for information on ecological constraints in relation to ornithology.

3.2.2.4 Invertebrates

Common hawker (*Aeshna juncea*) were identified within the grazing pasture west of Zone 4. No protected invertebrate species were identified during the suite survey. However, Moss

carder bee (*Bombus muscorum subsp. celticus*), a UK BAP invertebrate species, has been previously identified immediately adjacent to the southwestern boundary of Zone 4. However, habitats within Zone 4 are considered to be largely unsuitable for the species due to their sub-urban nature. Habitats within the Survey Area are not considered to be unique or of particularly high quality for invertebrates within the wider locality. As such, the project is unlikely to have any long-term impact upon local populations of invertebrates.

3.2.2.5 Reptiles

No reptiles, or evidence of reptiles, were identified during the site survey. However, Slow-worm (*Anguis fragilis*) and Common lizard (*Zootoca vivipara*) have been previously recorded within 5km of the Survey Area. Habitats within the Survey Area, including grassland, heathland, scrub and woodland are considered to provide a suitable habitat mosaic to the support populations of common and widespread reptilian species, such as Slow-worm.

A large area of Rhododendron (Rhododendron ponticum) scrub has recently been cleared within Zone 3. The clearance of an invasive scrub is likely to decrease shading and promote the growth of locally native flora. Thus, there is the potential for heathland habitat to become more favourable to reptiles. If construction works are to take place within Zone 3, there will be a need to resurvey the area to inform whether the habitat has suitability for reptiles, particularly Adder (*Vipera berus*).

3.2.2.6 Badger

There are records of Badger (*Meles meles*) within 5km of the site. The substrate within the woodland in Zone 1 was heavily waterlogged, and so was considered to be sub-optimal for sett building. Nonetheless, there is potential for Badger to forage/commute through the site. Suspected snuffle holes were identified within the broadleaved woodland in Zone 1 by an observer during the Breeding Bird Survey in March 2022. Mammal trails were noted within the dense ground vegetation during the Extended Phase 1 Habitat Survey, however no setts, day beds, latrines, foraging signs, scratching posts, hair or footprints were identified. The site survey was undertaken during August, which is considered to be sub-optimal for Badger survey due to the density of the ground vegetation and a reduction in Badger activity. It is therefore recommended that further species survey work take place during the optimal time period (October to April) for disturbance in Zone 1. The Badger Survey should also incorporate the small pockets of woodland within Zones 2 and 3 which were inaccessible during the site survey. These woodlands are well connected to high quality habitats within the wider locality and may provide suitable refuge for sett building.

3.2.2.7 Hedgehog

No Hedgehog (*Erinaceus europaeus*), or evidence of Hedgehog, was identified during the site survey. However, the species are known to be present within the local area. Habitats within the Survey Area, including woodland, amenity grassland and residential gardens are considered to provide a suitable habitat mosaic to support a population of Hedgehog.

3.2.2.8 Otter

There are records of Otter (*Lutra lutra*) within 500m of the Survey Area, however no Otter, or evidence of Otter, was identified during the site survey. Otter are known to be present in the area (confirmed sighting from local residents). Habitats within the Survey Area are not considered to be suitable to support a holt, due to lack of suitable habitat above high tide.

However, Otter may use the coastal margins as a layup. Otter likely use the coastal habitats spontaneously for foraging/commuting.

3.2.2.9 Pine Marten

No Pine marten (*Martes martes*), or evidence of Pine marten, was identified during the site survey. There are, however, records of Pine Marten within 500m of the Survey Area. The broadleaved woodland in Zone 1 and the smaller pockets of broadleaved and coniferous woodland in Zones 2 and 3 are considered to provide suitability to support Pine marten, when taking into consideration the larger habitat mosaic within the wider locality.

3.2.2.10 Red Squirrel

No Red squirrel (*Sciurus vulgaris*), footprints, feeding signs or dreys were identified during the site survey. However, there are records of Red squirrel within the broadleaved woodland in Zone 1. The broadleaved woodland in Zone 1 and the smaller pockets of broadleaved and coniferous woodland in Zones 2 and 3 are considered to provide suitability to support Red squirrel, when taking into consideration the larger habitat mosaic within the wider locality. In particular, it is likely that Red squirrel utilise the woodland in Zone 1 in conjunction with the coniferous woodland situated on the other side of the A82. Species record notes state that the species have been observed running across the A82 between the two woodland blocks.

3.2.2.11 Scottish Wildcat

There are records of Scottish wildcat within 5km of the Survey Area, however no evidence of Scottish wildcat (*Felix silvestris*) was identified during the site survey. Suitable habitat within the Survey Area is small in size and fragmented from any high-quality habitat by urban development, including busy roads (such as the A82) and residential and commercial structures. Therefore, it would be considered justifiable to assume that Scottish wildcat are absent from the Survey Area.

3.2.2.12 Water Vole

There are no known records of Water vole (*Arvicola amphibius*) within 5km of the Survey Area. Furthermore, no suitable watercourses or drains were identified within the Survey Area to provide suitable habitat to support Water vole. Based on the lack of suitable habitat it would be considered justifiable to assume that Water Vole are not present within the Survey Area.

3.2.2.13 Common and Widespread Terrestrial Mammals

The Survey Area supports a range of different habitats suitable to support populations of common and widespread terrestrial mammals, such as Rabbit (*Oryctolagus cuniculus*). Furthermore, habitats within Zone 3 were considered to be suitable to support Mountain Hare (*Lepus timidus*) which has been recorded within 5m of the Survey Area.

3.2.2.14 Protected Plant Species

Habitats within Zone 3 are known to support Lesser butterfly-orchid (*Platanthera bifolia*).. However, Lesser butterfly-orchid was not identified during the site survey. Heathland habitat within the area is considered to be suitable for the species. Although, the area has become heavily encroached by Rhododendron (*Rhododendron ponticum*) scrub which is likely to have increased shading and degraded the former habitat.

3.2.3 Invasive Species

3.2.3.1 Japanese Knotweed

A large patch of Japanese Knotweed (*Fallopia japonica*) was identified within the broadleaved woodland in Zone 1 (Target Note TN7; drawing 99_DRG_03_1. The patch was formerly identified during the Breeding Bird Survey, undertaken by Atmos. Japanese Knotweed is an INNS listed in Section 9 of the Wildlife and Countryside Act 1981 (as amended). The species is considered to be highly invasive and can have considerable impact upon hard infrastructure.

3.2.3.2 Rhododendron

Rhododendron (*Rhododendron ponticum*) is present throughout much of the Survey Area and has become established within several different habitats, including broadleaved woodland, coniferous woodland, scrub and heathland. Where present, the species dominates the ground-flora and has likely impacted upon former biodiversity. Rhododendron is an INNS listed in Section 9 of the Wildlife and Countryside Act 1981 (as amended).

A large area, previously dominated by Rhododendron, has recently been cleared to manage the INNS (Target Note TN11; depicted as J5 on drawing 99_DRG_03_01). The habitat was once a matrix of dry dwarf heath and introduced shrub (Rhododendron). It is hoped that the clearance will promote a growth of native flora and have a positive impact upon local biodiversity.

4 Discussion

The Extended Phase 1 Habitat Survey was undertaken in order to scope the Survey Area for potential ecological constraints to re-development in the area. As such, ecological features requiring further survey work within different zones (Zones 1, 2, 3 and 4) are provided to help inform upon suitable locations for re-development. Recommendations in relation to each survey Zone are provided below.

4.1 Zone 1

R1 A Badger Walkover Survey of the broadleaved woodland should be undertaken by a suitably qualified ecologist during an appropriate season (October – April).

R2 A Terrestrial Mammal Survey of the broadleaved woodland should be undertaken by a suitably qualified ecologist to determine the presence and distribution of Red squirrel and Pine marten (if any).

R3 A Preliminary Bat Roost Assessment (PRA) of individual trees requiring tree works (including removal) should be undertaken by a suitably qualified ecologist. Due to the complexity of the woodland and constraints of a ground-level inspection, a climbed inspection may be required. Potential Roost Features (PRF) should be inspected by endoscope by a suitably licenced bat worker.

R4 An Invasive Non-Native Species Management Plan (INNSMP) for Japanese Knotweed should be put in place and implemented with a matter of urgency.

R5 Otter are likely to utilise coastal margins spontaneously for foraging, commuting and potentially, as a layup. Therefore, suitable mitigation strategies to protect the species

should be produced. This should include a pre-construction survey to check for resting places and mitigation to avoid physical harm.

4.2 Zone 2

R1 A Badger Walkover Survey of the small pockets of broadleaved and coniferous woodland should be undertaken by a suitably qualified ecologist during an appropriate season (October – April).

R2 A Terrestrial Mammal Survey of the small pockets of broadleaved and coniferous woodland should be undertaken by a suitably qualified ecologist to determine the presence and distribution of Red squirrel and Pine marten (if any).

R3 A PRA of individual trees requiring tree works (including removal) should be undertaken by a suitably qualified ecologist. Due to the complexity of the woodland and constraints of a ground-level inspection, a climbed inspection may be required. PRFs should be inspected by endoscope by a suitably licenced bat worker.

R5 Otter are likely to utilise coastal margins spontaneously for foraging, commuting and potentially, as a layup. Therefore, suitable mitigation strategies to protect the species should be determined. This should include a pre-construction survey to check for holts

R6 An INNSMP for Rhododendron should be put in place to clear the Rhododendron from site, which will help promote the growth of native flora and provide a positive contribution to biodiversity net gain.

4.3 Zone 3

R7 An updated Extended Phase 1 Habitat Survey of the area should be undertaken by a suitably qualified ecologist prior to final project design as the existing habitats are likely to change as a result of recent clearance of the site. The updated PEAR should outline further survey work (if required).

R8 National Vegetation Communities (NVC) Surveys would be advisable to determine whether the habitat still support Lesser butterfly-orchid. Rhododendron clearance is likely to enhance the existing habitat to make it more suitable for Lesser butterfly-orchid. However, care should be taken when choosing suitable pesticides for clearance that is does not impact the protected species.

4.4 Zone 4

R6 An INNSMP for Rhododendron should be put in place to clear the Rhododendron from site, which will help promote the growth of native flora and provide a positive contribution to biodiversity net gain.

5 References

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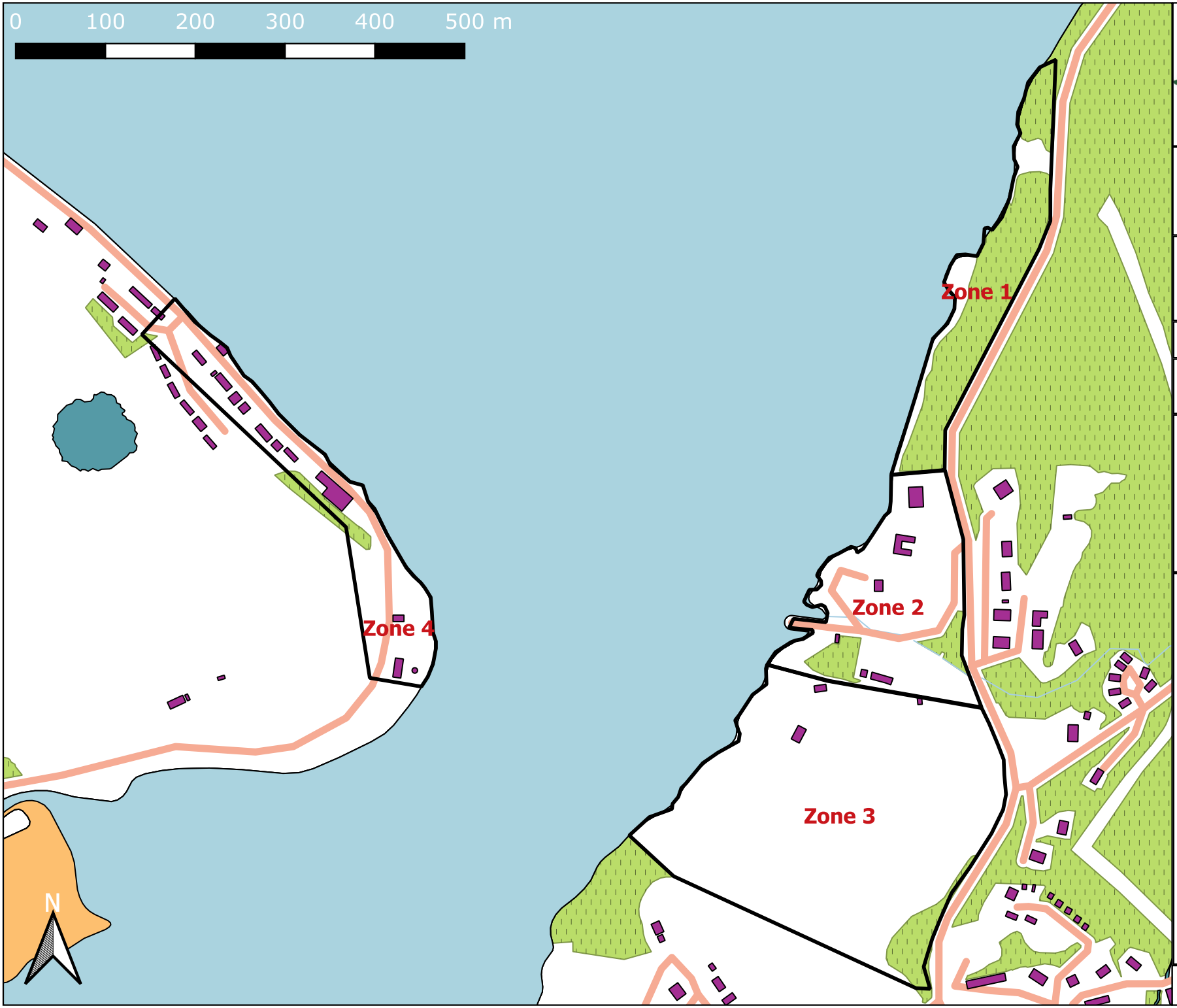
6 Glossary

Table 6.1: Glossary of terms used within the report

Acronym	Definition
BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BoCC	Birds of Conservation Concern
CIEEM	Chartered Institute of Ecology and Environmental Management
INNS	Invasive Non-Native Species
INNSMP	Invasive Non-Native Species Management Plan
JNCC	Joint Nature Conservation Committee
NBN	National Biodiversity Network
PEA	Preliminary Ecological Appraisal
PEAR	Preliminary Ecological Appraisal Report
PRA	Preliminary Bat Roost Assessment
PRF	Potential Roost Feature
SSSI	Site of Special Scientific Interest
SAC	Special Area of Conservation
SPA	Special Protection Area
THC	The Highland Council
QGIS	Quantum Geographic Information System

Appendix 1: Drawings



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99_DRG_02_1: Survey Area

Projection: OSGB 1936/British National Grid EPSG: 27700

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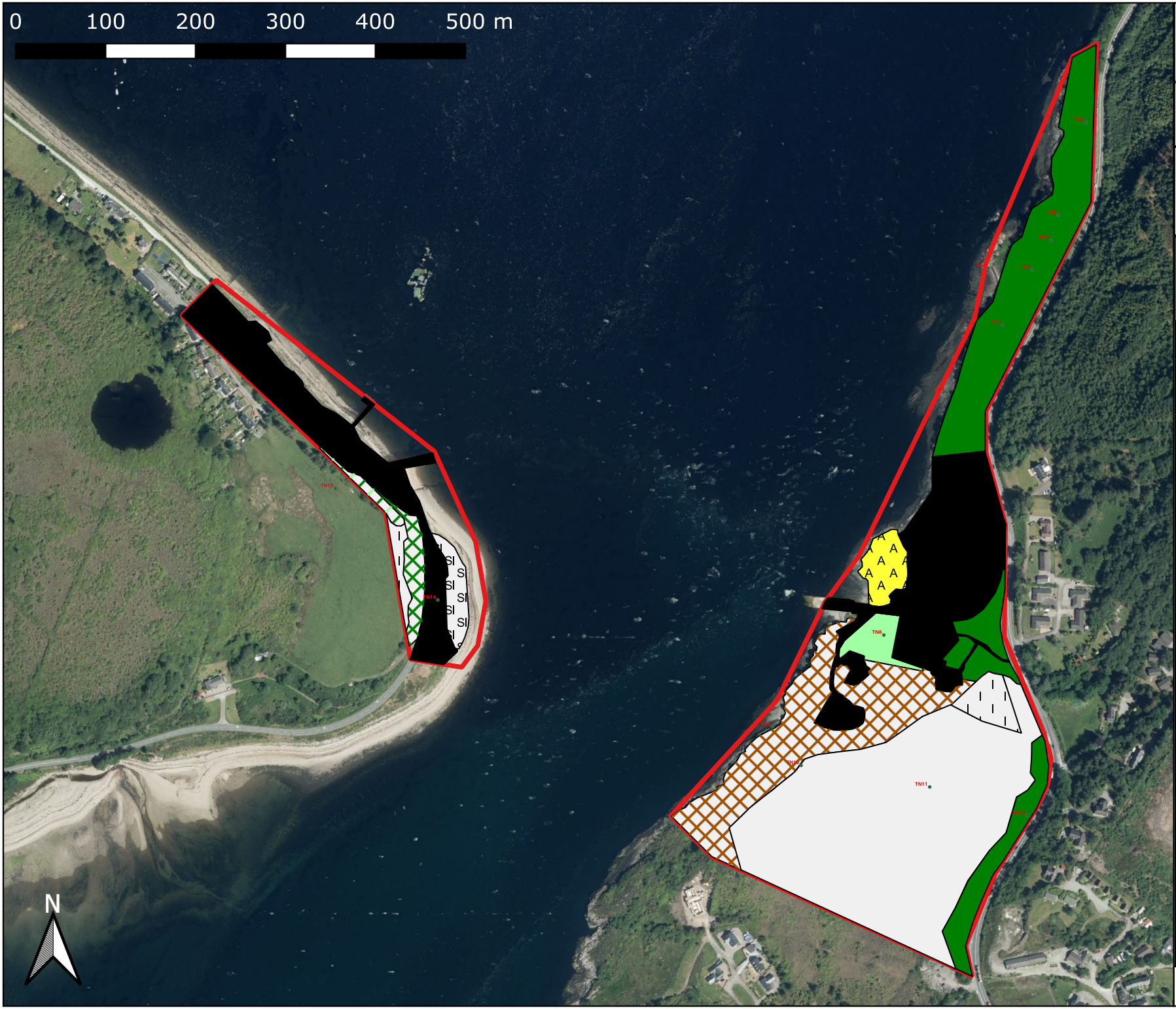
Open Streetmap "Base map and data from OpenStreetMap and OpenStreetMapFoundation".

Legend

- Buildings
- Foreshore
- Fresh Water
- Roads
- Tidal Water
- Woodland
- Zone 1
- Zone 2
- Zone 3
- Zone 4



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99_DRG_03_1: Site Habitat Map

Projection: OSGB 1936/British National Grid EPSG: 27700

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Legend

Habitats

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.2.1 - Coniferous woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- B4 - Improved grassland
- B6 - Poor semi - improved grassland
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.4 - Introduced shrub
- J3.6 - Buildings
- J5 - Other habitat
- Target Notes PEA
- Survey Area

Appendix 2: Target Notes

Table A2.1: Target notes recorded during the Extended Phase 1 Habitat Survey on the 23rd August 2022

Target Note No.	Easting	Northing	Description
TN1	202245	763783	Rocks slippery due to seaweed and heavy rain largely inaccessible
TN2	202307	763858	Large patch of Rhododendron
TN3	202291	763921	Cormorant identified on rocks
TN4	202369	763980	Mature Sycamore
TN5	202361	763952	Alder with Bracken understorey
TN6	202400	764083	Scattered Scots pine present
TN7	202340	763919	Large patch of Japanese knotweed spreading westwards
TN8	202175	763513	Woodland inaccessible due to Rhododendron shrub
TN9	202051	763411	Rocks slippery due to seaweed and heavy rain largely inaccessible
TN10	202083	763368	Steep incline difficult to climb due to rain and heathland vegetation
TN11	202226	763344	Rhododendron clearance recently taken place. Grasses starting to grow through dead vegetation
TN12	202334	763312	Linear feature of woodland inaccessible due to dense Bramble scrub
TN13	201565	763676	Offsite grazing pasture with patches of Juncus
TN14	201679	763552	Disused building with potential bat suitability

Appendix 3: Photographs

Figure A3.1: Coastal habitats adjacent to the Survey Area, Zone 1

Figure A3.2: Semi-natural broadleaved woodland within Zone 1

Figure A3.3: Semi-natural broadleaved woodland with a Bracken understorey within Zone 1

Figure A3.4: Broadleaved woodland bordering Loch Linnhe

Figure A3.5: Unusual structure within Zone 1, potential 'black house'

Figure A3.6: Patch of Rhododendron growing within the broadleaved woodland in Zone 1

Figure A3.7: Patch of Japanese knotweed growing within the broadleaved woodland in Zone 1

Figure A3.8: Rhododendron scrub dry heathland mix situated towards the southwest of Zone 3

Figure A3.9: Cleared Rhododendron scrub situated towards the southeast of Zone 3

Figure A3.10: Sheep grazing pasture towards the west of Zone 4

Figure A3.11: Boundary feature dominated by Cherry Laurel situated to the rear of the residential plots in Zone 4

Figure A3.12: Scrub dominated by Bramble, Gorse and Rhododendron situated on the western bank above the A in Zone 4

Appendix 4: Botanical Species List

Botanical species identified during the PEA include:

Alder (*Alnus glutinosa*)

Ash (*Fraxinus excelsior)*

Bell heather (*Erica cinerea*)

Bilberry (*Vaccinium spp.*)

Bracken (*Pteridium spp.)*

Bramble (*Rubus fruticosus*)

Buttercup (*Ranunculus spp.*)

Cherry laurel (*Prunus laurocerasus*)

Common knapweed (*Cantaurea nigra*)

Common nettle *(Urtica dioica*)

Creeping bent (*Agrostis stolonifera*)

Dandelion (*Taraxacum officinale*)

False oat-grass (*Arrhenatherum elatius*)

Field wood-rush (*Luzula campestris*)

Gorse (*Ulex spp.*)

Greater plantain (*Plantago major*)

Greater tussock-sedge (*Carex paniculate*)

Ground elder (*Aegopodium podagraria*)

Heather (*Calluna vulgaris*)

Heaths (*Erica spp.*)

Hogweed (*Heracleum sphondylium*)

Japanese knotweed (*Fallopia japonica*)

Rhododendron (*Rhododendron ponticum*)

Ribwort plantain (*Plantago lanceolata*)

Rowan (*Sorbus aucupari*)

Ryegrass (*Lolium spp.*)

Scots pine (*Pinus sylvestris*)

Silver birch (*Betula pendula*)

Soft rush (*Fallopia japonica*)

Stickyweed (*Galium aparine*)

Sycamore (*Acer pseudoplatanus*)

Thistle (*Cirsium spp.)*

Tufted hair-grass (*Deschampsia cespitosa*)

White clover (*Trifolium repens*)

Wild cherry (*Prunus avium*)

Wood sorrel (*Oxalis acetosella*)

Yorkshire fog (*Holcus lanatus*)

Corran Ferry Infrastructure Improvement Scheme

Appendix K.2: Breeding Bird Survey Report

Wallace Stone
Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

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Corran Ferry
19410

Technical Report

Corran Ferry

Breeding Bird Survey

Affric limited

September 2022

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1 Introduction

1.1 Terms of Reference

Atmos Consulting Ltd. was commissioned by Affric Limited on behalf of Highland Council to undertake a breeding bird survey at Corran Narrows, Corran, Scottish Highlands (hereafter referred to as the "Site").

1.2 Site Location and Description

The Site is located on either side of the Corran Narrows, the narrowest point of Loch Linnhe, approximately 13km south-west of Fort William. The Site comprises two sections: one on the western side of the Corran Narrows at Corran Ferry Port, and another on the eastern side at Ardgour Ferry Terminal. The Site boundary of the Corran section extends from Corran Point north-west along the A861 and includes much of the Corran settlement. The Site boundary of the Ardgour section incorporates land between the waters of Loch Linnhe and the A82, extending north from Blàr Moine to Poll a' Phloid.

1.3 Objectives

The objectives of this report are to:

- Summarise the avian desk study information obtained to date for the Site; and
- Document the ornithological survey methodologies and avian species recorded.

1.4 Proposed Development

The proposed scheme is for expansion of the Corran and Ardgour ferry port facilities.

2 Methodology

2.1 Desktop Study

2.1.1 Designated Sites

The desktop study consisted of a search for statutory and non-statutory designated Sites with avian qualifying features within 10km of the Site, as well as a data review for sources of information relating to bird populations on and within the vicinity. Various data sources were utilised including the website of the statutory agency, NatureScot via the "Site Link Portal" (https://sitelink.nature.scot/home).

2.1.2 Species Records

A search of publicly available records within 2km of the Site was undertaken using various data sources including datasets freely available for commercial use held on the National Biodiversity Network (NBN) Atlas website (https://data.nbn.org.uk).

2.2 Survey Methodologies

Survey methodologies were in accordance with SNH (2017b) guidance as well as survey methodologies described in Gilbert *et al*. (1998) and Hardey *et al*. (2013).

All surveys were carried out by experienced ornithological surveyors who hold NatureScot Schedule 1 bird licences.

2.2.1 Breeding Bird Survey

A breeding bird survey was carried out using the Brown & Shepherd breeding bird survey method (Brown & Shepherd, 1993). This technique is used to census upland breeding waders such as golden plover *Pluvialis apricaria*, dunlin *Calidris alpina*, greenshank *Tringa nebularia* and other species of open upland moor, but can be used in a residential / agricultural setting to record all species and provides a reliable estimate for most species.

Surveys were undertaken between April and June, avoiding high winds and other unfavourable weather conditions. The method is based on a constant search effort, allowing 20 to 25 minutes per 500 x 500m quadrat of open land. A predetermined route through each quadrat was followed so that all areas of each quadrat were approached to within at least 100m, with the surveys taking place between 08:30 and 18:00, in accordance with the guidelines.

The behaviour and location of each individual bird was recorded on a 1:25,000 scale map, using standard BTO codes. Records from each survey were combined into a final visit map, so that duplicate records of the same birds could be removed.

Birds were assumed to be breeding or holding a territory (confirmed breeding) at a location if one or more of the following was recorded:

- Presence of a nest, eggs or young (including newly fledged); and / or
- A bird was observed carrying food or breeding material.

In the absence of either of these indicative behaviours, birds were classified as probable breeding if one or more of the following was recorded:

- Courtship, displaying or singing in the same location on more than one visit;
- Agitated behaviour including alarm calls or distraction display; and / or
- Territorial disputes.

In the absence of any of the above indicative behaviours, birds were classified as possible breeding if one or more of the following was recorded:

- Singing or displaying on one visit;
- A pair in suitable habitat; and / or
- Birds reacting antagonistically on one visit.

Other records were considered to be of non-breeding birds.

2.3 Survey Limitations

Surveys were undertaken at a suitable time of year and under suitable weather conditions and no limitations have been identified in this regard.

3 Results

3.1 Desk Study

3.1.1 Designated Sites

Statutory Designations

There are two designated sites with avian qualifying features in the vicinity (< 10km) of the proposed development (Table 1 refers).

Table 1: Designated Sites

Designated Site	Designated Feature	Distance from Site Boundary
Special Protection Areas (SPA)		
Moidary and Ardgour (NatureScot, 2010)	Golden Eagle *Aquila chrysaetos*	Approximately 1.5km to the north-west
Glen Etive and Glen Fyne (NatureScot, 2010)	Golden Eagle *Aquila chrysaetos*	Approximately 3.75km to the south-east

3.1.2 Species Records

A search of the NBN Atlas (undertaken under licence OGL, CC-BY-NC) for the last 10 years within a 2km radius of the proposed development showed records for six species (Table 2 refers) that are listed either on:

- Annex I of the EC Birds Directive (2009/147/EC);
- Schedule 1 of the Wildlife and Countryside Act 1981 (as amended); or
- Red or Amber lists of Birds of Conservation Concern 5 (BoCC 5) (Stanbury *et al.*, 2021).

Table 2: Recorded Bird Species (data from NBN Atlas)

Species[1]	Annex I	Schedule 1	Red list (BoCC 5)	Amber list (BoCC 5)
Dunnock *Prunella modularis* [1]				X
House sparrow *Passer domesticus* [1]			X	
Wren *Troglodytes troglodytes* [1]				X
Black guillemot *Cepphus grille* [1]				X
Herring gull *Larus argentatus* [1]			X	
Willow warbler *Phylloscopus trochilus* [1]				X

[1] Data sourced from Birds (BTO / JNCC / RSPB Partnership)

3.2 Breeding Bird Survey

Three Brown and Shepherd visits were carried out as detailed in Table 3. The study area for this survey included the site boundary plus a 200m buffer (access permitting) (Appendix A, Figure 1 refers).

Table 3: Moorland Breeding Bird Survey Effort 2020

Visit Number	Date	Observer	Start time	Stop time	Duration
1	23/06/2022	Alexander Kennard	09:30	13:30	4hrs
2	12/07/2022	Alexander Kennard	10:00	14:30	4hrs 30mins
3	27/07/2022	Alexander Kennard	09:50	13:20	3hrs 30mins

During the breeding bird survey, a total of 42 species were recorded (Appendix A, Figure 1 refers). Table 4 presents, alphabetically, each of the species in terms of their conservation value and breeding status at the Site.

Table 4: Breeding Bird Survey Recorded Species

BTO Code	Common Name	Scientific Name	EU Birds Directive: Annex I	Schedule 1 Wildlife & Countryside Act 1981	Scottish Biodiversity List (SBL)	Birds of Conservation Concern (BoCC)	Breeding Status and number of territories (possible, probable, confirmed or non-breeding)
AE	Arctic tern	*Sterna paradisaea*	X		X	Amber	Non-breeding (1)
TY	Black guillemot	*Cepphus grylle*				Amber	Confirmed (1) Non-breeding (2)
B.	Blackbird	*Turdus merula*				Green	Probable (3) Possible (2)
BT	Blue Tit	*Cyanistes caeruleus*				Green	Possible (2)
CG	Canada goose	*Branta canadensis*				Introduced	Non-breeding (2)
C.	Carrion crow	*Corvus corone*				Green	Probable (1)
CH	Chaffinch	*Fringilla coelebs*				Green	Probable (3)
CT	Coal tit	*Periparus ater*				Green	Probable (1) Possible (1)
CD	Collared dove	*Streptopelia decaocto*				Green	Possible (1)
CM	Common gull	*Larus canus*				Amber	Probable (2) Possible (2) Non-breeding (4)
CS	Common sandpiper	*Actitis hypoleucos*				Amber	Possible (2)
CN	Common tern	*Sterna hirundo*	X		X	Amber	Non-breeding (2)
E.	Eider	*Somateria mollissima*				Amber	Possible (1) Non-breeding (4)
GC	Goldcrest	*Regulus regulus*				Green	Possible (2)

BTO Code	Common Name	Scientific Name	EU Birds Directive: Annex I	Schedule 1 Wildlife & Countryside Act 1981	Scottish Biodiversity List (SBL)	Birds of Conservation Concern (BoCC)	Breeding Status and number of territories (possible, probable, confirmed or non-breeding)
GO	Goldfinch	*Carduelis carduelis*				Green	Probable (1)
GD	Goosander	*Mergus merganser*				Green	Possible (2)
GB	Great black-backed gull	*Larus marinus*				Amber	Non-breeding (1)
GT	Great tit	*Parus major*				Green	Possible (2)
GR	Greenfinch	*Chloris chloris*				Red	Probable (2) Possible (1)
H.	Grey heron	*Ardea cinerea*				Green	Non-breeding (4)
HG	Herring gull	*Larus argentatus*			X	Red	Possible (4) Non-breeding (5)
HC	Hooded crow	*Corvus cornix*			X	Green	Non-breeding (1)
HM	House martin	*Delichon urbicum*				Red	Probable (1) Non-breeding (1)
HS	House sparrow	*Passer domesticus*			X	Red	Probable (5)
LR	Lesser redpoll	*Acanthis cabaret*				Red	Probable (1)
MA	Mallard	*Anas platyrhynchos*				Amber	Non-breeding (1)
MP	Meadow pipit	*Anthus pratensis*				Amber	Probable (1)
OP	Osprey	*Pandion haliaetus*	X	X	X	Amber	Non-breeding (1)
OC	Oystercatcher	*Haematopus ostralegus*				Amber	Probable (1) Possible (3) Non-breeding (2)
PF	Pied wagtail	*Motacilla alba*				Green	Probable (3)
RA	Razorbill	*Alca torda*				Green	Non-breeding (2)
R.	Robin	*Erithacus rubecula*				Green	Probable (4) Possible (1)
RC	Rock pipit	*Anthus petrosus*				Green	Possible (1)
RO	Rook	*Corvus frugilegus*				Amber	Possible (1)
SI	Siskin	*Carduelis spinus*			X	Green	Possible (1)
SF	Spotted flycatcher	*Muscicapa striata*			X	Red	Possible (1)
SG	Starling	*Sturnus vulgaris*			X	Red	Probable (1)
SL	Swallow	*Hirundo rustica*				Green	Possible (1)
W.	Wheatear	*Oenanthe oenanthe*				Amber	Possible (1)
WW	Willow warbler	*Phylloscopus trochilus*				Amber	Probable (5) Possible (2) Non-breeding (1)
WP	Woodpigeon	*Columba palumbus*				Amber	Probable (2) Non-breeding (1)

BTO Code	Common Name	Scientific Name	EU Birds Directive: Annex I	Schedule 1 Wildlife & Countryside Act 1981	Scottish Biodiversity List (SBL)	Birds of Conservation Concern (BoCC)	Breeding Status and number of territories (possible, probable, confirmed or non-breeding)
WR	Wren	*Troglodytes troglodytes*			X	Red	Probable (4)

4 Discussion & Mitigation

Three species recorded on site are Annex I listed species: arctic tern, common tern and osprey. However, all observations were identified as non-breeding individuals. Therefore no specific mitigation is required.

All wild birds are protected by law whereby for any wild bird species, it is an offence to intentionally or recklessly:

- kill, injure or take a bird
- take, damage, destroy or interfere with a nest of any bird while it is in use or being built
- obstruct or prevent any bird from using its nest
- take or destroy an egg of any bird

If further works are required during the bird breeding season (considered to be March to August, inclusive), the following measures are recommended in order to minimise any potential impact on breeding birds within the Site:

- A breeding bird survey should be undertaken prior to construction commencing.
- A toolbox talk on breeding birds should be given to all site staff before works commence.
- Site staff should stay vigilant for the presence of nests especially in areas of thick scrub as well as any breeding bird behaviour including birds carrying food, nesting materials, alarm calling or making distraction displays.
- The working footprint will be limited to the minimum required to undertake the works and all vehicles will keep to designated routes.
- Any materials or machinery left overnight should be checked at the start of each day for the presence of breeding or recently fledged birds.
- If any nests are located within the footprint of the works, all works within that area should cease and an Ecologist contacted for advice.
- In the event a nest is identified, an exclusion zone should be established appropriate to the species and after taking advice from an Ecologist – generally the exclusion zone will be 5 – 10m for non Schedule 1 birds. Such exclusion zones would only be required while the nest is considered "active".

5 References

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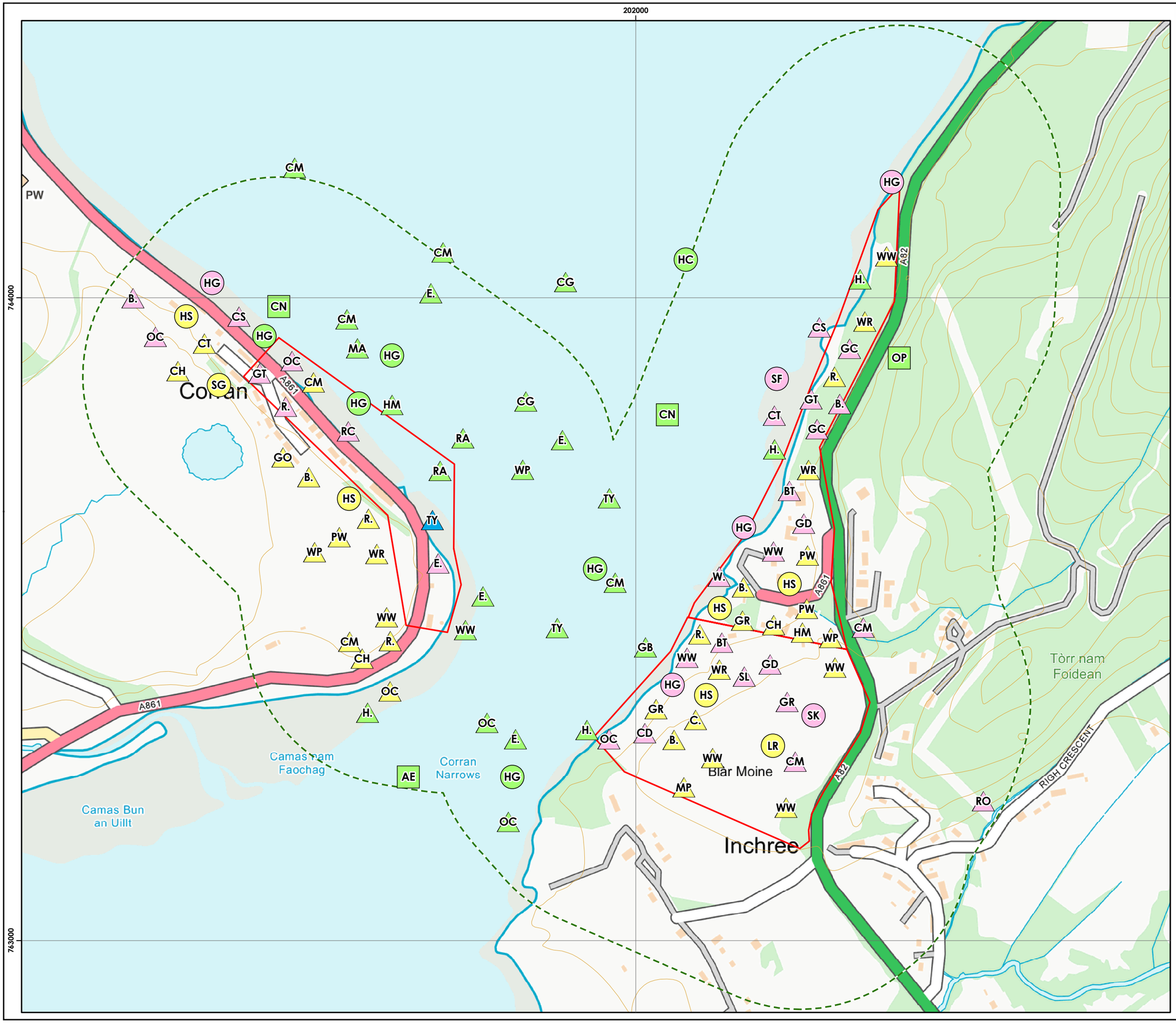
Appendices

Appendix A. Figures

Figure 1 - Breeding Bird Survey Results



Corran Ferry

Affric

Figure 1
Breeding Bird Survey Results

Key

Site boundary

Survey area - 250m buffer

Category

Schedule 1/Annex 1

Scottish Priority Species

Not designated

Breeding Status

Confirmed

Probable

Possible

Non-breeding

atmos CONSULTING

0 100 200
Meters

N

Scale @ A3:
1:5,500

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01/09/2022 19410/OR/001a

Drawn by: JT Checked by: TH Approved by: JW

Corran Ferry Infrastructure Improvement Scheme

Appendix K.3: Bat Survey Report

Wallace Stone
Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

Corran Ferry Infrastructure Improvement Scheme

Bat Survey Report

Report No. 99_REP_21

Date: 06/02/2025

Document Control

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1 Introduction

The Highland Council (THC) are proposing to upgrade the existing ferry terminals at the Corran Narrows under the Corran Ferry Infrastructure Improvement Scheme (CFIIS). The scheme will involve the construction of new infrastructure in the village of Ardgour, and just north of the Corran settlement in the region of Nether Lochaber, to facilitate the introduction of a new electric vessel for the ferry service and improve facilities for users and operators of the Corran Ferry.

Wallace Stone, as the principal engineers to the CFIIS, have appointed Affric Limited (hereafter referred to as 'Affric') to undertake ecological surveys of the CFIIS development boundary. The purpose of the ecological survey works is to inform the Environmental Impact Assessment (EIA). In particular, to determine which protected species are likely to be ecological receptors of the CFIIS and provide evidence of the sensitivity of those receptors within the development site. Bats were initially identified as a potential ecological receptor of the CFIIS during a Preliminary Ecological Appraisal (PEA) of the site (Affric, 2022). Hence, it was determined that further ecological survey works for bats would be required.

The survey works for bats included a Preliminary Roost Assessment (PRA), bat activity surveys and an endoscope inspection completed by a licenced bat worker. The data provided within this report will succeed information provided within the initial Protected Species Survey Report (Affric, 2024). It should be understood that the data collected as part of these survey works was undertaken to inform the EIA and not to obtain the necessary data to inform a European Protected Species (EPS) Licence, which may be undertaken at a later date if required.

2 Site Description

2.1 Survey Area Location

The CFIIS development boundary is comprised of four distinct land parcels, which run alongside either side of Loch Linnhe, through the settlements of Nether Lochaber and Ardgour. Two of the land parcels are situated in Nether Lochaber, including the Nether Lochaber development site and the Nether Lochaber construction compound site (collectively referred to as the 'Nether Lochaber planning boundary') (as shown in Drawing 99_DRG_C2_1). The other two land parcels are situated in Ardgour, including the Ardgour development site and the Ardgour construction compound site (collectively referred to as the 'Ardgour planning boundary') (as shown in Drawing 99_DRG_C2_1).

All four of the land parcels associated with the CFIIS are connected within the planning applications red line boundary (see Drawing 99_DRG_C2_1). However, it is worth noting that the connective corridors are delineated solely for administrative purposes to create a single boundary appropriate for the planning application. Therefore, these connective corridors are not considered within the protected species survey works, as no development works associated with the CFIIS are proposed within these areas.

The Nether Lochaber and Ardgour planning boundaries are separated by Loch Linnhe. It is acknowledged that bats could fly over Loch Linnhe, particularly in the area of the Corran Narrows, and therefore, there could be ecological connectivity between the populations of bats in Nether Lochaber and Ardgour. However, the Nether Lochaber and Ardgour planning boundaries are considered separately within this report, to ensure that a thorough

understanding of the potential for bats within the specific areas of development can be understood.

The bat activity survey area was situated towards the north of the Nether Lochaber development site and comprised of the wooded area situated between the A82 and Loch Linnhe (as shown in Drawing 99_DRG_26_1).

2.2 Habitats

The four land parcels incorporate habitats and infrastructure associated with a coastal village. The Nether Lochaber development site is comprised, in-part, by a sub-urban landscape made up of residential and commercial buildings with associated hard and soft landscaping. In the surrounding areas, plant communities associated with woodland, grassland, scrub, and heathland habitats are present. Whilst the Nether Lochaber construction compound site is comprised of degraded bog and hard standing.

The Ardgour development site is predominantly sub-urban, due to existing residential and commercial development, although coastal margins and agricultural land provide some semi-natural habitat. The Ardgour construction compound is largely comprised of agricultural land with some areas of hard standing.

Invasive Non-native Species (INNS) have been recorded in both Nether Lochaber and Ardgour. Rhododendron (*Rhododendron ponticum*) has become a significant problem within both Nether Lochaber and Ardgour, dominating much of the existing habitats. A large stand of Japanese knotweed (*Fallopia japonica*) was identified in 2022 within the broadleaved woodland, situated towards the north of the Nether Lochaber development site (Affric, 2022). During the habitat surveys completed in 2024, additional Japanese knotweed plants were recorded within the woodland, and it was noted that Japanese knotweed plants were also within close proximity to the boundary of the Ardgour development site and Ardgour construction compound site. Montbretia (*Crocosmia x crocosmiiflora*) was also identified towards the north of the Nether Lochaber development site (Affric, 2025). All three INNS are listed within Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

For further detail on the habitats situated within the survey areas, please refer to the UKHab Survey and Baseline Condition Assessment (Affric, 2025).

3 Legislation

All bat species found in Scotland are EPS and therefore receive full protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (commonly known as the 'Habitats Regulations'). This legislation makes it an offence to deliberately or recklessly:

- Capture, injure or kill a bat;
- Harass a bat or group of bats;
- Disturb a bat in a roost (any structure or place it uses for shelter or protection);
- Disturb a bat while it is rearing or otherwise caring for its young;
- Obstruct access to a bat roost or otherwise deny an animal use of a roost;
- Disturb a bat in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species;
- Disturb a bat in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young; and

- Disturb a bat while it is migrating or hibernating.

It is also an offence of strict liability to:

- Damage or destroy a breeding site or resting place of a bat (whether or not deliberately or recklessly); and
- Keep, transport, sell or exchange, or offer for sale or exchange any wild bat (or any part or derivative of one) obtained after 10th June 1994.

An EPS licence may be sought from NatureScot to allow works that would otherwise be considered an offence to be undertaken legally. This includes invasive survey works and activities associated with development. All works completed as part of this survey which had potential to cause disturbance were completed by a licenced bat worker.

It is noted that should a licence be required to undertake any development works legally, a licence will be sought prior to the commencement of any works which could cause disturbance to bats. This would be accompanied by a Roost Characterisation Assessment, detailing the species and estimated number of bats that could be affected, and an appropriate Species Protection Plan.

4 Methodology

4.1 Desktop Study

A data collection exercise (desktop study) for protected species was initially undertaken as part of the PEA process in August 2022 (Affric, 2022). This desktop study was then updated in 2023 as part of the initial bat survey works (Affric, 2024), and again in 2024, due to the time lapse since the bat survey works in 2023. During the desktop study, data was obtained from a variety of sources. Information on statutory sites including location, citations and conservation objectives was obtained from NatureScot's online portal 'SiteLink' (NatureScot, 2025) and the Department for Environment, Food and Rural Affairs' (DEFRA) online portal 'DEFRA MAGIC' (DEFRA, 2025). Commercially available data records of bat species, previously identified within the Nether Lochaber and Ardgour planning boundaries, or within 2 kilometres (km) of the sites, were obtained from the National Biodiversity Network (NBN) Atlas (NBN, 2025). Aerial photography from Google Maps was also utilised to allow for an assessment of potential connectivity between the Nether Lochaber and Ardgour planning boundaries and habitats within the wider locality (Google, 2025).

4.2 Preliminary Roost Assessment

An initial PRA for bats was undertaken on the 24th May 2023 and 16th August 2023 by a competent and experienced ecologist from Affric, in line with Bat Conservation Trust's (BCT) 'Bat Surveys for Professional Ecologists: Good Practice Guidelines' (Collins, 2016) (as at the time of survey, this was the most current BCT guidance). The PRA was comprised of a ground-level inspection of all trees within the Nether Lochaber and Ardgour planning boundaries and a 30 metre (m) buffer area (as shown in Drawings 99_DRG_24_1 and 99_DRG_25_1). In addition, a single-storey building situated within the Ardgour scoping boundary (which has since been excluded from the development boundary) was also surveyed via a ground-level internal and external inspection.

The broadleaved woodland situated towards the north of the Nether Lochaber development site was re-assessed the 6th August 2024 by a licenced bat worker (from Tracks Ecology Ltd), supported by a competent and experienced ecologist (from Affric), in order to inform the bat activity survey approach and provide an opportunity for further investigated works. The re-assessment was made in line with the new BCT 'Bat Surveys for Professional Ecologists: Good Practice Guidelines', which were published in 2023 (Collins, 2023). The PRA of the woodland was comprised of a ground-level inspection of all trees within the woodland. Where necessary and feasible, an endoscope was utilised to inspect the interior of features to determine whether the internal structure had potential for roosting bats. As no bat droppings were identified during either the PRA in 2023 or 2024, no data was sent for eDNA analysis.

The suitability of built structures to support roosting bats was assessed as per Table 4.2.1.

Table 4.2.1: Assessment Criteria for Suitability of Roosting Habitats for Bats (developed from Collins, 2023)

Potential Suitability	Description	
	Roosting Habitats in Structures	Potential Flight-paths and Foraging Habitats
None	No habitat features on site likely to be used by any roosting bats at any time of year (i.e. a complete absence of crevices/suitable shelter at all ground/underground levels).	No habitat feature on site likely to be used by any commuting or foraging bats at any time of year (i.e. no habitats that provide continuous lines of shade/protection for flight-lines or generate/shelter insect populations available for foraging bats.
Negligible	No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.	No obvious habitat features on site likely to be used as flight paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of year. However, these potential roost sites do not provide enough space, shelter, protection appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity and not a classic cool/stable hibernation site, but could be used by individual hibernating bats).	Habitat that could be used by small number of bats as flightpaths such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape b other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a line tree (not in a parkland situation) or patch of scrub.

Potential Suitability	Description	
	Roosting Habitats in Structures	Potential Flight-paths and Foraging Habitats
Moderate	A structure with one or more potential roost sites that could be use by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for flightpaths such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be sued by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger number of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions, and surrounding habitat. These structures have the potential to support high conservation status roost, e.g. maternity or classic cool/stable hibernation site.	Continuous, high-quality habitat that is well connected to the sider landscape that is likely to be used regularly by bats of flight-paths such as river valley, streams, hedgerow , lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roost.
Confirmed	Roost confirmed through the identification of bats within a roost or definitive signs of recent use by bats.	Foraging bat identified.

4.3 Passive Acoustic Monitoring

Six Titley Scientific Chorus Static Ultrasonic Detectors were placed within the woodland situated north of the Nether Lochaber development site (as shown in Drawing 99_DRG_26_1). The detectors were spread throughout the woodland to provide an understanding of bats usage of the entire area. Detectors were installed for three survey deployment periods during 'spring, 'summer' and 'autumn' to ensure coverage of the entire bat active season was captured.

All detectors were set to commence recording 30 minutes before sunset and continue until 30 minutes after sunrise. Detectors were deployed with the microphones connected directly to the units and secured to trees at approximately 2m above ground level. The survey deployment period aimed for a minimum of 10 days of suitable weather conditions which include temperatures at dusk in excess of 8 degrees Celsius (°C), maximum ground level wind speed of 5m/s or 18km/h and a lack of, or only very light, rainfall.

The audio files were analysed by a licenced bat ecologist (see Section 4.5: Sonogram Analysis).

4.4 Bat Activity Surveys

Night-time bat activity surveys were also undertaken within each of the 'spring, 'summer' and 'autumn' seasons. The surveys were designed to complement the passive acoustic monitoring and comprised of a mix of dawn and dusk surveys at four locations, undertaken during a single nighttime period by two teams of surveyors. Surveys were designed to provide additional insight into bat activity (commuting or foraging) and identify any patterns which static detectors are unable to identify (e.g. estimate of minimum number of bats present and directions of flight).

The survey locations were broadly located in the four corners of the site; in the northeast, northwest, southeast and southwest (as shown in Drawing 99_DRG_26_1). The northwest and southwest locations concentrated on assessing the level of activity along the woodland edge, which runs along the shores of Loch Linnhe. Safe nighttime access to the eastern woodland edge which borders the main A82 public road was not possible. In addition, in many areas, the density of the woodland and vegetation, restricted the extent of the surveyor's field of view. As a result, the survey locations were positioned within small openings in the woodland, with surveyors orientating themselves and night vision aids to observe potential flights along the woodland edge.

Each team consisted of a competent and experienced ecologist, equipped with an active acoustic ultrasonic bat detector (Echo Metre Touch Pro 2, connected to a Samsung Galaxy Tab Active 5) and thermal imaging camera (including either a FLIR T560, T640 or T865, all with a 640x480 pixel lens).

Over the three survey periods, each location was subject to at least one dusk and dawn survey, with the third survey randomised. The surveyors recorded the time, species and behaviour of any bats detected (where possible). Subsequent validation of these observations were then assessed against both sonogram recordings and the thermal imaging recordings.

4.5 Sonogram Analysis

Analysis of full spectrum Waveform Audio File Format (WAV) files was undertaken using Anabat Insight v2.1.2-0-g3566bf9. All files were analysed with the assistance of bespoke species filters to identify and separate common and soprano pipistrelle. This automated analysis was then subject to manual checks of approximately 20% of all calls. Where concerns over the accuracy were present, further manual species identification was undertaken. All sonogram files excluded by the pipistrelle filters were then subject to manual checking of WAV sonograms and where bat calls were present, manual identification was undertaken. Species identification broadly followed that presented in 'British Bat Calls: A Guide to Species Identification' (Russ, 2012), considering the geographical location of the bat activity survey area, habitats present and the ecologists' own expertise and site knowledge.

Some species of bat are difficult to confidently identify from sonogram analysis alone. As a result, not all calls were identified to species level with all species from the *Myotis* genus identified to genera level only (hereafter referred to as '*Mytois* bat' where applicable).

Absolute measures of bat activity are not possible to reliably calculate for automated field studies, as during recording session, it is not possible to differentiate between one bat passing the detector ten times or ten different bats passing the detector on a single occasion. As a

result, relative measures are used and must be taken into consideration when interpreting results.

The index of bat activity was taken to be a sonogram file (maximum length of 15 seconds), recorded from the static detectors. Although this is to some degree an arbitrary measure, the activity levels are comparable across detectors and is a frequently used index. For this report, each file containing a call from a species is termed a 'pass'. For some portions of the analysis, data is then converted to passes per hour adjusting for location specific night-time duration (sunset to sunrise) and days of deployment (adjusted to each detectors period of functioning). In addition, active minutes are also used as a measure within the activity surveys. An active minute is defined as any 60 second period with a bat pass registered. For example, if ten passes are recorded all within the minute commencing at 21:55 then that would equal one active minute.

Sonogram data for each detector location during each of the survey sessions was organised and used for analysis of activity levels across static detector locations and across survey periods. In addition, the data was also organised into the required format to upload for additional analysis within the secure online tool Ecobat (Ecobat, 2025). This analysis tool enables comparisons to be made in a spatial context allowing a geographically relevant assessment of activity levels. It should be noted that there is no function within Ecobat to know what volume of data is being used for geographic comparisons and as the system is in its infancy, interpreting comparative measures, especially within northern Scotland requires caution.

The Ecobat analysis approach includes a variety of outputs useful for ascertaining the importance of a site with respect to bat distribution and activity levels. In northern Scotland, the issue of spatial and temporal variation is very pronounced with the potential for bat detectors to record no activity at locations generally unsuitable for bats, for example some upland sites. Ecobat can analyse rates of activity including or excluding 'zero activity' nights. Within this document figures presented are those calculated including all 'zero activity' nights, unless otherwise stated. In comparison to excluding 'zero activity' nights, this will result in lower activity rates being presented but considering the location of the bat activity survey area, this is assessed as being the approach which will produce the most accurate assessment of activity. Analysis provided by Ecobat with respect to the geographical context providing a comparative measure of high, moderate or low activity, however, is based on the exclusion of 'zero activity' nights and although presented here, is likely to be an over-estimation of true activity levels. As night length varies throughout the survey period, rates of activity were calculated on a per night basis and corrected for variable night length with total number of passes during a survey night divided by the number of hours between sunset and sunrise. Bat passes per night do, however, remain an easy to comprehend index of activity levels and will also be presented within the analysis where relevant.

To provide further insight into variation in bat activity, activity rates, calculated as bat passes per hour, are also referred to. As a result of the significant variation in activity rates of bats within different geographical locations and habitats, a relative bat activity scale, based on the data recorded and the experience of the bat ecologist, is used in some instances (Table 4.2.2).

Table 4.2.2: Relative Bat Activity within the Bat Activity Survey Area

Bat Passes Per Hour	Activity Level
>5	High
2-5	Medium
<2	Low

4.6 Limitations

It is difficult to ensure that acceptable weather conditions are experienced during bat survey work in northern Scotland. However, to compensate for this risk, detector deployment sessions were extended beyond that recommended. Although some periods of sub-optimal weather were encountered the extended periods of monitoring resulted in non-significant impact on results.

Individual thermal imaging cameras failed on three occasions, each time relating to a low battery life preventing the necessary data processing being completed by the device's software to allow saving of useable files. This was prevented, where possible, by the operator stopping and re-starting the recording at regular intervals.

Although limitations exist, the data obtained provides a clear picture of bat activity across the bat activity survey area and as a result it is not anticipated that the limitations affect the robustness of the results to a significant degree.

5 Results

5.1 Desktop Study

The Core Sustenance Zone of bats is generally considered to be the area around a roost site in which bats will utilise and rely on for resources. Of the bat species known to be present in the Scottish Highlands, natterer's bat (*Myotis nattererii*) are anticipated to have the greatest Core Sustenance Zone of 4 kilometres (km) (BCT, 2016). As such, the desktop study included a search for species records and designated sites within 4km.

No sites designated for the presence of bat species were identified within 4km of the CFIIS development boundary.

No records of bats were identified within the CFIIS development boundary itself, however three species of bat, including common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and brown long-eared bat (*Plecotus auritus*) were previously recorded within 4km (NBN, 2025). Records of common pipistrelle and soprano pipistrelle were identified towards the northeast and southeast of the Nether Lochaber planning boundary. Whilst records of brown long-eared bat were identified northwest of Ardgour (NBN, 2025).

5.2 Preliminary Roost Assessment

5.2.1 Trees

The north of the Nether Lochaber development site is largely comprised of a broadleaved woodland. Much of the woodland is dominated my former hazel coppice, which has since begun to naturalise, with a range of native species including silver birch, holly and rowan. However, there are also stands of mature alder and mature larch within the woodland. The woodland is a strip approximately 50m wide, situated between Loch Linnhe on the west and the A82 on the east.

Multiple Potential Roosting Features (PRFs) were identified within the trees, comprising of a variety of natural features, such as woodpecker holes, rot holes, cracked stems, hazard beams, insect infestation and rot (i.e., at branch junctions), snapped out tops and cracks in the stem structure (see Table 5.2.1). All of the PRFs identified within Nether Lochaber were considered to have low suitability for bats, with the exception with a large cavity identified within a mature tree in the Nether Lochaber development site (R14; Table 5.2.1).

In addition, a mature beech tree was identified within the wider survey area (i.e., within 30m from any proposed development works), which was considered to have moderate suitability for roosting bats, due to the presence of several PRFs associated with features of old growth (see R28; Table 5.2.1).

The PRFs identified on trees during the survey are outlined in Table 5.2.1.

Table 5.2.1: Records of Potential Roosting Features Identified During the Preliminary Roost Assessment for Bats

Record Number	Location		Trees Species	Comments	Suitability
	Easting	Northing			
R10	202249	763719	Alder	Two small holes on the stem, thought to be formed due to loss of branches and subsequent decay.	Low
R11	202250	763730	Downy birch	Large cracks in the stem. No evidence of current use by bats.	Low
R12	202260	763741	Sycamore	Small cavities in the stem, with potential for individual bats. No evidence of current use by bats.	Low
R13	202271	763765	Common ash	Small cavities in the stem. Further inspection indicates that there is no larger cavity present in the stems centre.	Low
R14	202286	763777	Silver birch	Large vertical crack in the bark of the stem opens up into a large cavity within the centre of the tree. Endoscope inspection identified suitable roosting opportunities for multiple bats, although no evidence of bats was identified at the time of inspection.	Moderate
R15	202280	763818	Alder	Small gaps beneath peeling bark. Snapped out top.	Low
R17	202290	763840	Alder	Small cavity in stem. Further inspection indicates that there is no larger cavity present in the stems centre.	Low
R18	202301	763841	Alder	Small gaps under peeling bark and snapped out stem. Further inspection determined that there was negligible potential for roosting bats.	Negligible
R19	202316	763846	Alder	Small cavities in the stem that appear to be a result of woodpeckers, insects or rot.	Low
R20	202322	763850	Alder	Crack in stem.	Low
R21	202316	763855	Alder	Crack in stem. Some suitability, although does not go deep into the stem. No evidence of bats identified.	Low
R22	202338	763890	Alder	Small cavities in the stem that appear to be a result of woodpeckers, insects or rot and gaps beneath pealing bark.	Low
R28	201456	763717	Beech	Large mature beech tree with many features of old growth, including fungal brackets and large cavities.	Moderate
R43	202289	763749	Silver birch	Small gaps behind flaking bark.	Low
R44	202272	763770	Silver birch	Cavity in non-dominant stem. Endoscope investigation identified no evidence of bats.	Low

Record Number	Location		Trees Species	Comments	Suitability
	Easting	Northing			
R45	202267	763770	Ash	Large mature ash tree. Tree could not be fully inspected due to height and dense canopy. No PRFs anticipated but assumed roosting potential as a precaution.	Low
R46	202275	763805	Alder	Dense ivy with thick stems around stem of tree, with suitable roosting opportunities within and beneath foliage.	Low
R47	202274	763811	Alder	Standing dead alder with pealing bark.	Low
R48	202284	763818	Lime	Cavity caused by included union on co-dominate stems.	Low
R50	202333	763877	Silver birch	Small gaps behind pealing bark.	Low
R51	202310	763892	Alder	Dense ivy with thick stems around stem of tree, with suitable roosting opportunities within and beneath foliage.	Low
R52	202311	763893	Alder	Small gaps behind flaking bark.	Low
R56	202370	764084	Alder	Small cavity in stem.	Low
R60	202313	763891	Alder	Cavities in stem of tree. No evidence of bats identified.	Low
R61	202263	763739	Lime	Large mature lime tree. Tree could not be fully inspected due to height and dense canopy. No PRFs anticipated but assumed roosting potential as a precaution.	Low

5.2.2 Built Structures

5.2.2.1 Nether Lochaber

No built structures were identified within the Nether Lochaber planning boundary that required further consideration in relation to roosting bats.

5.2.2.2 Ardgour

There was initially discussion that refurbishment of a listed building, the Lighthouse Store (MHG17310) (THC, 2025), may be undertaken as part of the CFIIS. However, it has since been determined that the Lighthouse Store will not be included within the development plans. Nonetheless, the survey works completed on the Lighthouse Store to date are included to provide further context of the potential for bats within the local area.

The Lighthouse Store is situated NN 0167 6355, immediately adjacent to the western banks of Loch Linnhe. The building dates back to the late 19th century and is single storey. The walls are three-bay, constructed with red-brick. The gable roof is constructed of overlapping slate tiles supported by a timber frame. There are window fixtures on all elevations of the building comprised of glass panels supported by timber frames. The external doorway is situated on the northern elevation and is comprised of wood. There is no chimney.

Internally, the building was relatively clean and tidy. The key holder confirmed that the floors and surfaces are cleaned on a semi-regular basis. There were three rooms in total, a large room which made up the majority of the building and two smaller rooms towards the eastern elevation. The rooms were filled with machinery, tools, and equipment, some of which had evidently been in place for some time. Machinery was inspected for potential bat droppings, although none were identified. Plywood had been placed over timber support beams to separate the main rooms from the roof void. The roof void could not be accessed for inspection however, where possible, a torch was used to look up into the roof space through gaps in the plyboard (predominantly around the edge of the room), to inspect for suitability of the structure for roosting bats. Additionally, the plyboard itself was inspected for evidence of urine stains.

Overall, the building was in fair condition and was being used by THC as a workshop and storeroom however, the lead flashing situated on the roof apex had risen in some places, particularly towards the eastern end of the building and several of the slate tiles have become risen providing potential access/egress points. There were also small gaps between the window and door fixtures and the brick walls. Internally, gaps in the plyboard ceiling structure provide potential access/egress between the roof void and the main structure. The PRFs were only considered to be suitable for individual roosting bats to use opportunistically. Furthermore, no evidence of roosting bats was identified internally or externally. Nonetheless, due to the number of PRFs, the building was considered to have moderate suitability for roosting bats.

5.3 Static Detectors

5.3.1 Weather

Current NatureScot guidance on bat survey works stipulates that surveys should capture enough nights with appropriate weather conditions for bat activity (NatureScot, 2021). Although this guidance was developed for windfarms, this approach is considered to be equally relevant to non-wind farm developments, and therefore was considered during the CFIIS bat survey works. Lower temperature requirements are identified for Scotland than other areas of the UK, with a minimum recommended temperature of 8°C at dusk and wind speeds less than 5 metres per second (m/s) or 18 kilometres per hour (km/h). This is because bats in Scotland would generally be expected to be better adapted to these conditions. No bespoke site based weather station was deployed as part of the survey and weather data has been taken from the nearest available data station at Kentallen Bay (Ref: IAPPIN74) which is located at sea level at approximately NN009578, 6km south of the CFIIS development boundary (Weather Underground, 2025).

Survey 1 was undertaken during spring, in late May and early June 2024. Temperatures during this time were considered to be average for the time of year at this northern location. Night-time temperatures fell below the recommended 8°C on a significant proportion of the survey period, although these low temperatures were only experienced in the late stages of the night with temperatures in the region of 10°C at dusk when bats would be expected to be most active.

Wind speeds were generally low during the deployment with no peaks exceeding the recommended 18km/h or 5m/s threshold. The central section of the survey period did experience windier periods, however, on average these remained below 10km/h. Furthermore, only a single precipitation event occurred late on in the survey period, during the early afternoon of 9th June 2024. The weather during Survey 1 does result in minor limitations with respect to temperature, however, these were assessed as being representative of the northern location in which the survey took place.

Survey 2 was undertaken during the summery months in late June and early August 2024. Nights during survey period 2 were relatively warm and settled weather conditions, although a cold night was experienced on 30th July 2024. Wind speeds were also generally low for the duration of the survey. Periods of rain, although more frequent than during Survey 1, were again relatively light and short in duration. Thus overall, no significant limitations were therefore experienced due to weather during Survey 2.

Survey 3 was undertaken in early autumn, during September 2024. Temperatures during the survey period varied significantly between day and night, with many nights dipping down to just below the recommended 8°C. The beginning of the survey period also experienced high winds, exceeding the maximum recommended for a short duration. Rainfall was again frequent but light and of short duration. As with the survey in spring, the weather does result in minor limitations with respect to temperature, however, these are assessed as being representative of the northern location.

Although it is recognised that the conditions may have limited bat activity on a small number of nights, overall, the weather conditions during the survey periods were adequate for the

surveys. For full details on the weather conditions recorded during the three survey periods, please refer to Figures 5.3.1, 5.3.2 and 5.3.3.

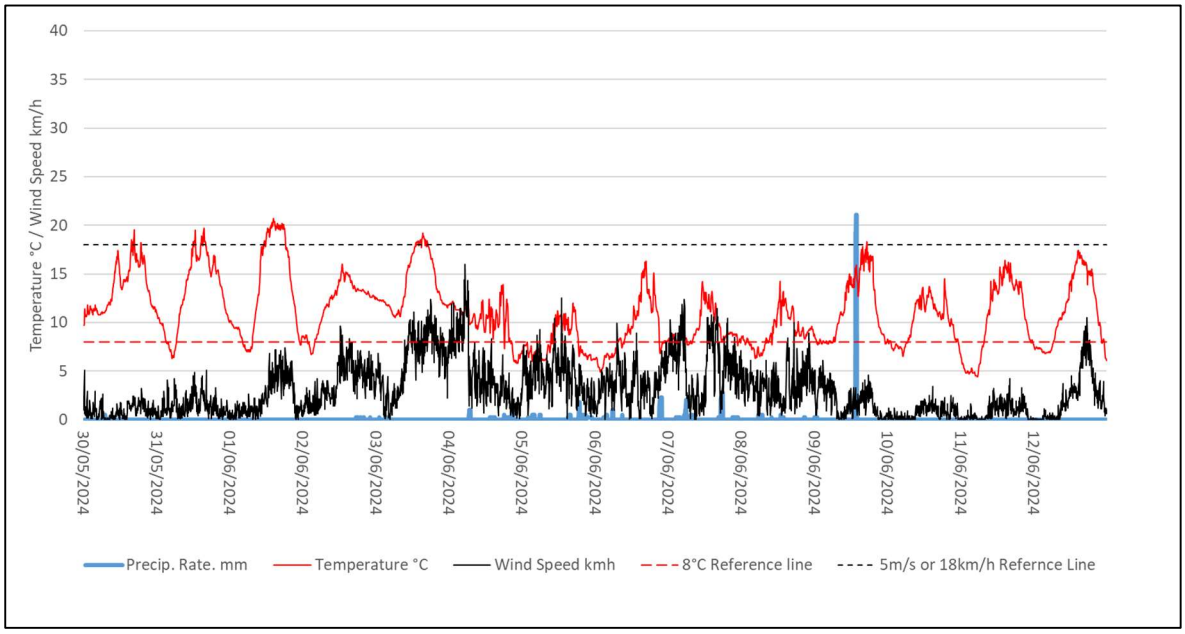

Figure 5.3.1: Weather Data for Survey 1

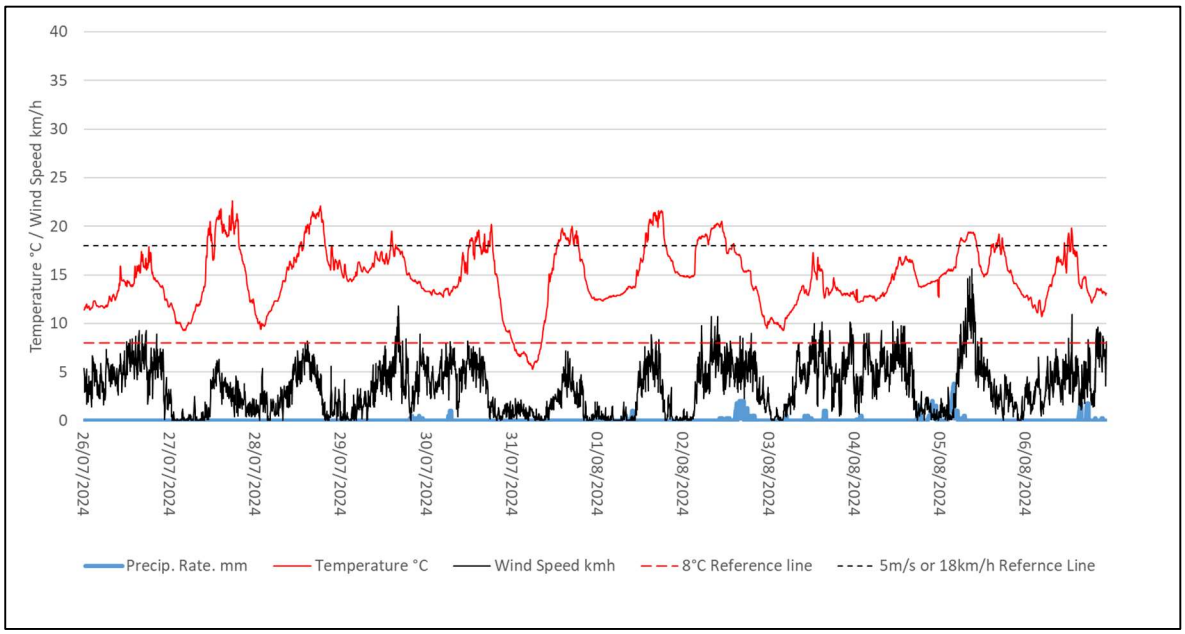

Figure 5.3.2: Weather Data for Survey 2

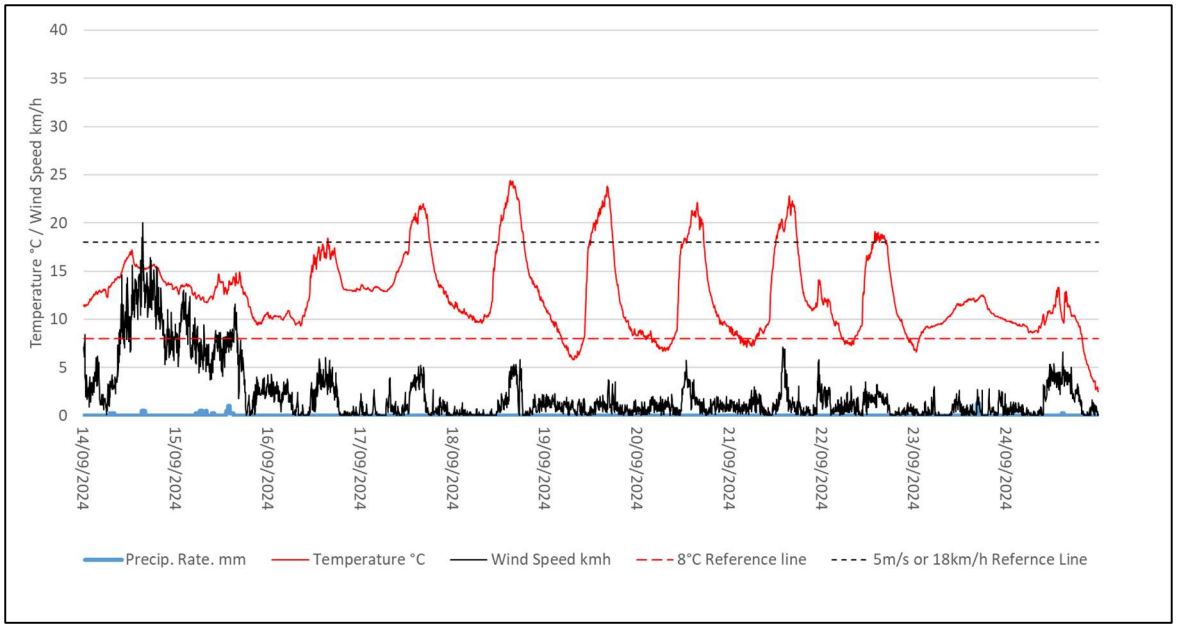

Figure 5.3.3: Weather Data for Survey 3

5.3.2 Overall Activity

The results of the static detector surveys identified the presence of at least four species, including common pipistrelle, soprano pipistrelle, brown long-eared bat and *Myotis* bat. Hence, the species assemblage is anticipated to be of regional importance (Chartered Institute of Ecological and Environmental Management (CIEEM), 2023). In total, 3,139 passes were identified across the six detectors, over the three survey periods (Table 5.3.1).

Table 5.3.1: Summary of Bat Passes across Surveys and Detector Locations

Survey Period	Detector Location	Total Number of Passes					Total Number of Nights	Average Passes Per Night (All Species)
		Common Pipistrelle	Soprano Pipistrelle	Myotis Bat	Brown Long-eared Bat	Total		
Spring	1	197	51	0	1	249	12	20.8
	2	0	0	1	0	1	12	0.1
	3	252	12	4	0	268	12	22.3
	4	187	91	3	0	281	12	23.4
	5	1	1	1	0	3	12	0.3
	6	274	30	0	0	304	12	25.3
	Total	**911**	**185**	**9**	**1**	**1106**	**72**	**15.4**
Summer	1	567	63	0	0	630	10	63.0
	2	0	0	0	0		10	0.0
	3	32	0	0	0	32	10	3.2
	4	343	45	1	0	389	10	38.9
	5	1	0	0	0	1	10	0.1
	6	282	78	1	0	361	10	36.1
	Total	**1225**	**186**	**2**	**0**	**1413**	**60**	**23.6**
Autumn	1	52	108	0	0	160	9	17.8
	2	8	1	0	0	9	9	1.0
	3	1	1	0	0	2	9	0.2
	4	103	91	2	0	196	9	21.8
	5	123	126	2	0	251	9	27.9
	6	0	2	0	0	2	9	0.2
	Total	**287**	**329**	**4**	**0**	**620**	**54**	**11.5**
TOTAL	**ALL**	**2423**	**700**	**15**	**1**	**3139**	**186**	**16.9**

Bat pass rates were often highly variable between nights, within and across locations, with some nights having few or no passes and other nights having relatively high activity. This is particularly pronounced on sites within northern Scotland with weather conditions, including wind speed, often more variable, especially in exposed locations. In these circumstances, the median is likely to be a more useful summary of the typical activity than is the mean (Lintott & Mathews, 2018). In addition, night length varies dramatically at northern latitudes resulting in passes per night not necessarily being a good comparative measure of activity levels. As a result, median pass rates per hour are primarily the presented data, along with an indication of mean pass rates where relevant.

The mean and median of passes per night across the locations and survey periods are detailed in Table 5.3.2. The activity across the bat activity survey area was assessed as low during all survey periods.

Table 5.3.2: Summary of Bat Passes per Night Across all Surveys at Detector Locations showing Mean and Median Nightly Pass Rates per Hour over the entire Survey Period (including Zero Data Nights for each Species at each Detector Location)

Detector Location	Common Pipistrelle (n=2,243)			Soprano Pipistrelle (n=700)			*Myotis* Bat (n=15)		
	Total No. of Passes	Median Nightly Pass Rate	Mean Nightly Pass Rate	Total No. of Passes	Median Nightly Pass Rate	Mean Nightly Pass Rate	Total No. of Passes	Median Nightly Pass Rate	Mean Nightly Pass Rate
1	816	0.668	2.916	222	0.338	0.679	0	0	0
2	8	0	0.017	1	0	0.002	1	0	0.004
3	285	0.243	1.160	13	0	0.052	4	0	0.016
4	633	0.911	2.250	227	0.170	0.754	6	0	0.020
5	125	0	0.297	127	0	0.3	3	0	0.009
6	556	0.313	2.159	110	0	0.4	1	0	0.003

* Brown long-eared bats are excluded from analysis as there was only a single registration.

Activity levels at each of the detector locations varied with Location 2 supporting extremely low activity levels, with Location 1 and 4 supporting the greatest (Figure 5.3.4). The spring and summer seasons were the most active with autumn recording just 620 bat passes.

In relation to the wider region, the relative activity levels of the bats recorded based on total bat passes each night for each species, compared to the values in the Ecobat reference database. The results indicate the percentile of the survey data, and therefore what the relative activity level is (Table 5.3.3), It is worth noting that the reference data for which Ecobat is calculating comparative activity levels from consists of between.

Table 5.3.3: Summary Table showing Key Metrics for Each Species Recorded

Activity Band		Common Pipistrelle	Soprano Pipistrelle	Myotis Bat	Brown Long-eared Bat
	Exceptional	0	0	0	0
	High	0	0	0	0
	Moderate/High	0	0	0	0
	Moderate	0	0	0	1
	Low/Moderate	1	0	1	0
	Low	74	45	1	0
Total Nights recorded		75	45	2	1
Median Percentile		1	1	23	51
Max Percentile		24	11	29	51
95% Confidence Interval Range		5.5-15.0	4.5-9.0	0	0
Reference Data Range*		39992	41160	1750	116

* It is recommended that a Reference Range of >200 is required to be confident in relative activity levels.

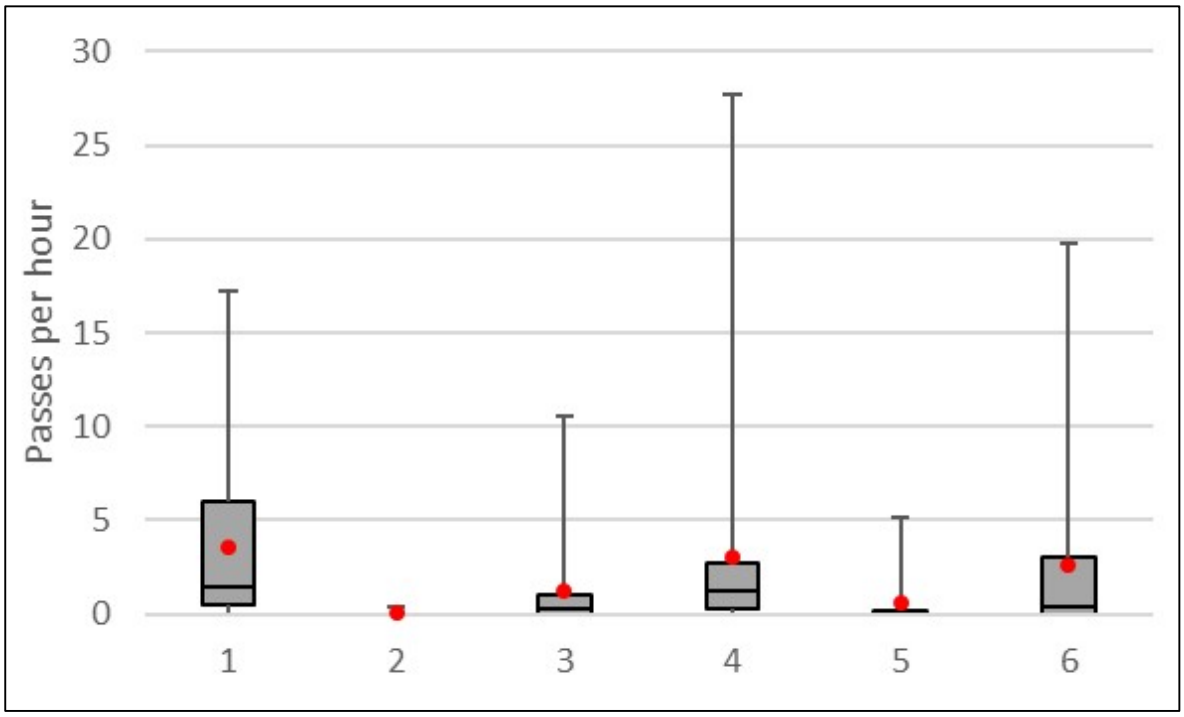

Figure 5.3.4: Boxplot for the Number of Bat (all Species) passes per Hour across Detector Locations over all Survey Periods (including Nights of Zero Activity). The 'Box' shows the Interquartile Range, with Median (Central Line) and upper and lower 25% Ranges. The Mean is also shown (red Circle)

5.3.3 Common Pipistrelle

Passes from common pipistrelle totalled 2,423 across all locations and all surveys, forming 77% of the total bat calls. The distribution of common pipistrelle calls was non-uniform with Locations 1,3,4 and 6 accounting for 96% of the calls with only 8 and 125 passes recorded at locations 2 and 5 respectively.

Temporal variation between the surveys showed a significant decline in activity levels during the autumn survey period (Figures 5.3.1, 5.3.2 and 5.3.3).

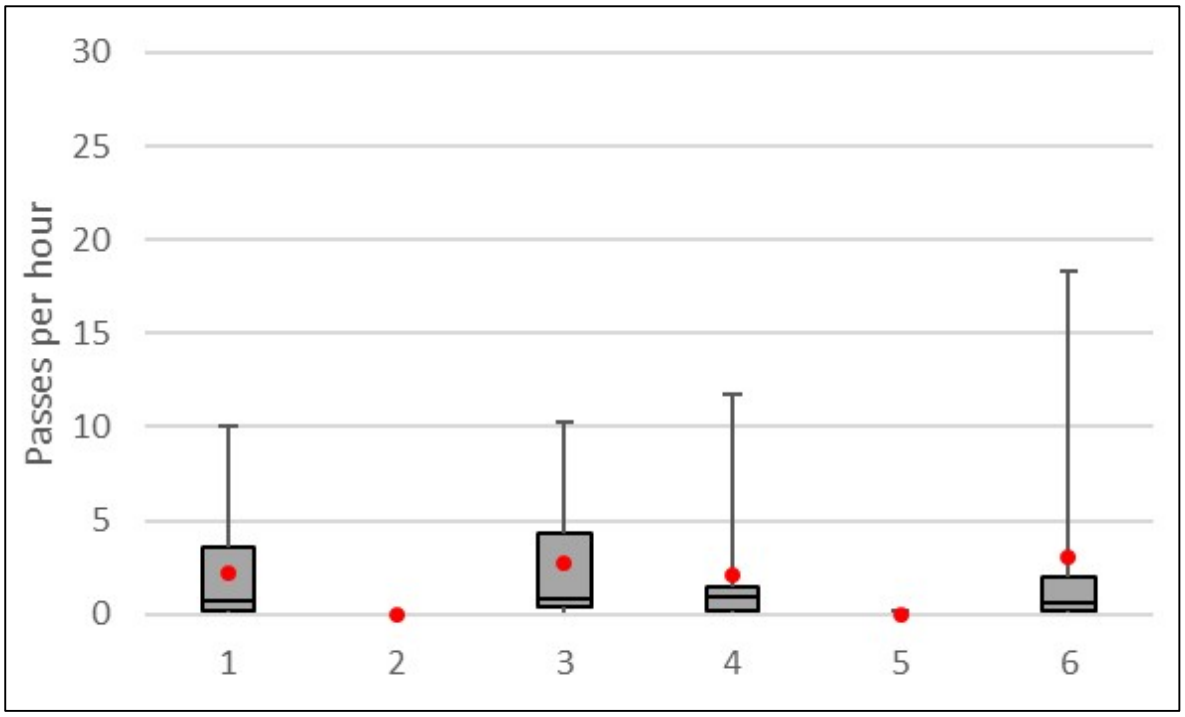

Figure 5.3.1: Boxplot showing the Median Nightly Pass Rate (Bat Passes per Hour) and Mean (Circles) of Common Pipistrelle Bats during Survey 1. Data includes Zero Activity Nights

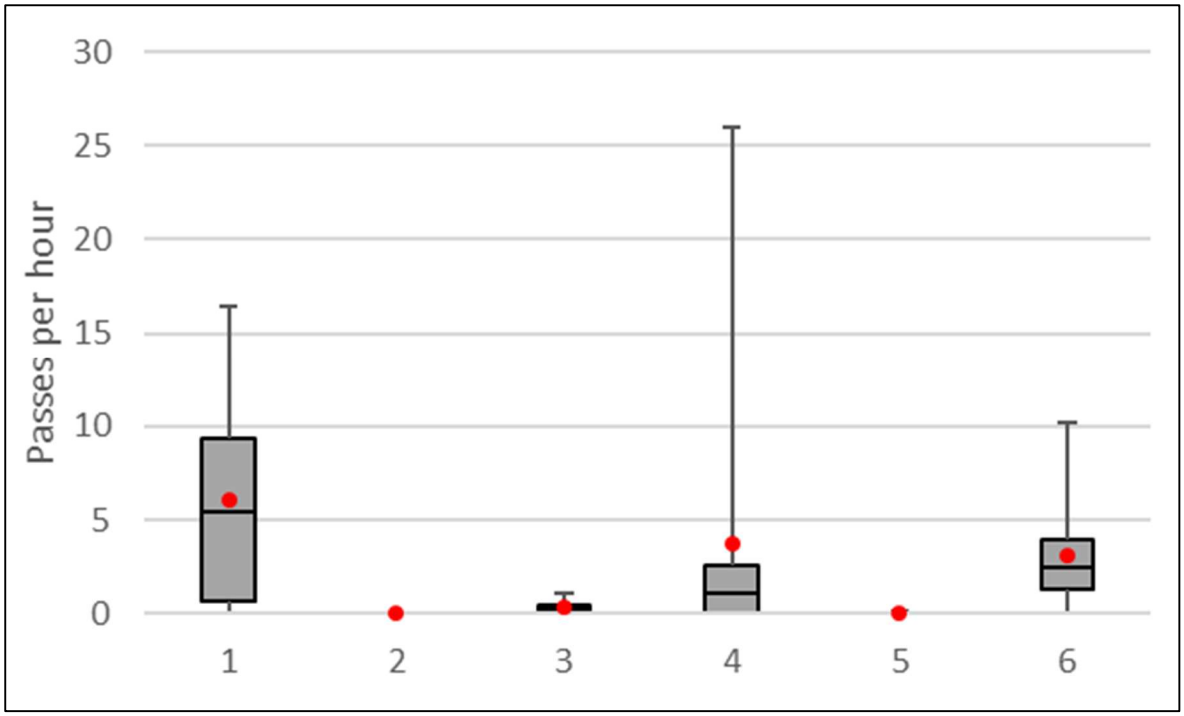

Figure 5.3.2: Boxplot showing the Median Nightly Pass Rate (Bat Passes per Hour) and Mean (Circles) of Common Pipistrelle Bats during Survey 2. Data includes Zero Activity Nights

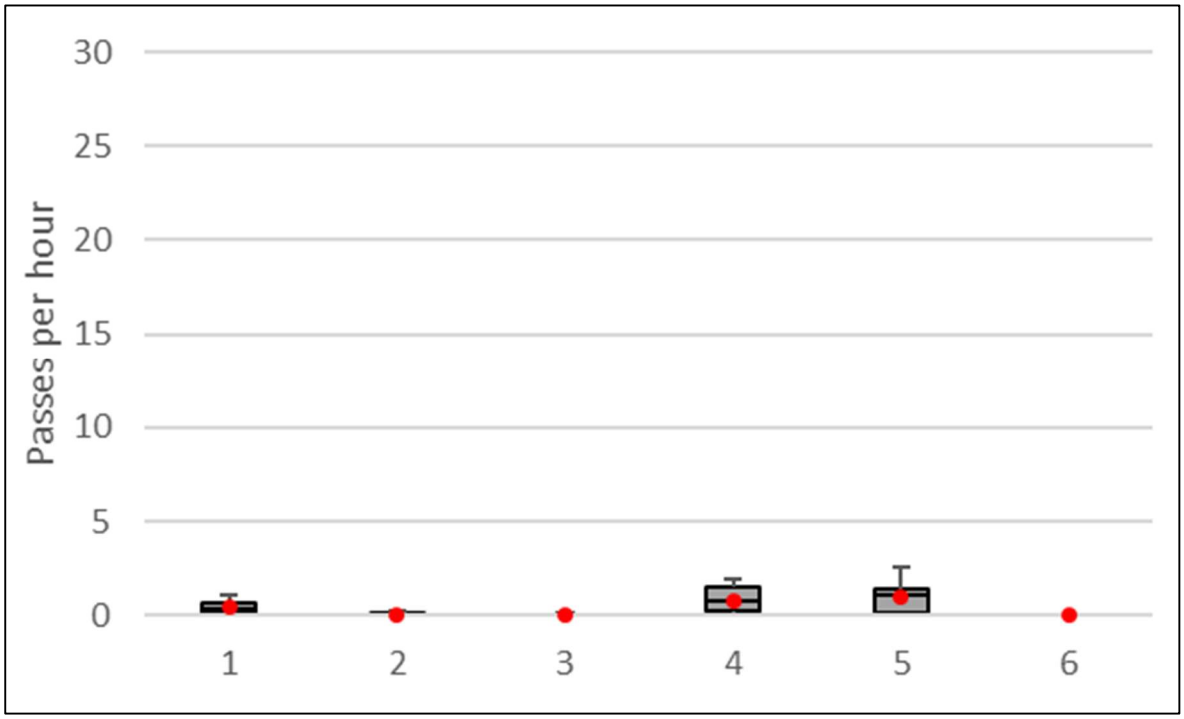

Figure 5.3.3: Boxplot showing the Median Nightly Pass Rate (Bat Passes per Hour) and Mean (Circles) of Common Pipistrelle Bats during Survey 3. Data includes Zero Activity Nights

The time of recorded bat passes in relation to sunset can provide an indication of whether a roost is likely to be nearby. Where bats are recorded close to sunset, especially during or before the recognised emergence time (Russ, 2012) of any particular species, this indicates that bats are likely to be using roosting sites close to the detector. With respect to the temporal distribution of common pipistrelle activity in relation to sunset a small number of calls were

recorded at locations 1 and 3, although most calls at these locations were recorded after the recognised emergence period (Figure 5.3.5). This may indicate that a small roost is close to locations 1 and 3. However, the small number of registrations would suggest that any roost is unlikely to be used frequently, and likely to be used by a single bat at best. All other locations recorded relatively standard activity patterns for commuting and foraging bats with peaks of activity commencing around 1 hour after sunset. With respect to variation in passes per hour for common pipistrelle across different locations, Table 5.3.4 presents individual night pass rates.

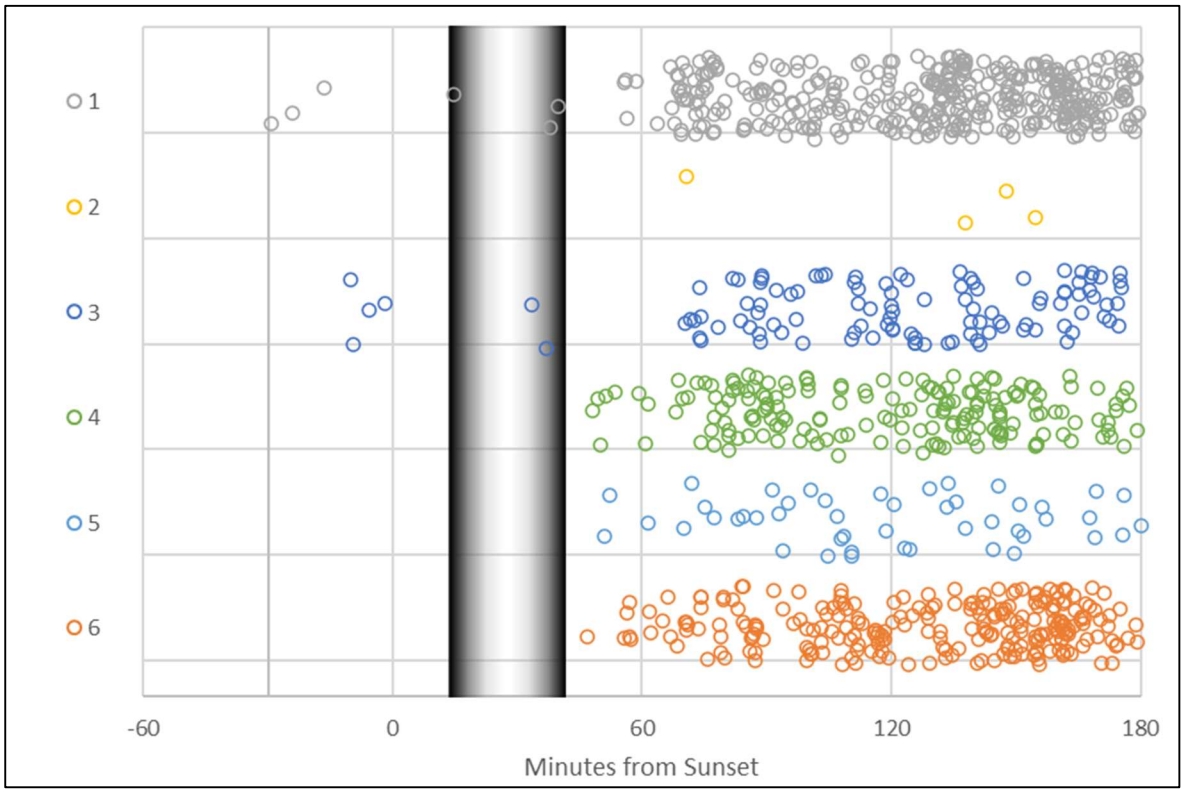

Figure 5.3.5: Temporal Distribution of all Common Pipistrelle Calls recorded within 3 Hours after Sunset in Relation to Time of Sunset across Detector Locations. Grey Section indicates recognised Emergence Period

Table 5.3.4: Activity Rate for each Location across each Night for Common Pipistrelle, where Activity was Recorded

Survey	Date	Night Length	Date	Location					
				1	2	3	4	5	6
1	30/05/2024	6.68	30/05/2024	0.00	0.00	0.60	0.15	0.00	0.00
1	31/05/2024	6.62	31/05/2024	0.15	0.00	10.28	1.06	0.00	0.00
1	01/06/2024	6.58	01/06/2024	10.03	0.00	8.51	1.37	0.00	0.76
1	02/06/2024	6.53	02/06/2024	5.66	0.00	7.50	7.04	0.00	2.91
1	03/06/2024	6.50	03/06/2024	0.00	0.00	0.31	0.15	0.00	0.46
1	04/06/2024	6.48	04/06/2024	0.15	0.00	0.15	0.15	0.00	0.00
1	05/06/2024	6.45	05/06/2024	0.62	0.00	0.62	1.55	0.00	1.40
1	06/06/2024	6.40	06/06/2024	0.47	0.00	0.31	0.63	0.00	0.31
1	07/06/2024	6.37	07/06/2024	0.94	0.00	0.79	1.10	0.00	0.16
1	08/06/2024	6.35	08/06/2024	0.79	0.00	0.79	0.16	0.00	1.10
1	09/06/2024	6.32	09/06/2024	0.95	0.00	1.90	0.79	0.16	2.22
1	10/06/2024	6.30	10/06/2024	4.44	0.00	5.08	3.33	0.00	15.56
1	11/06/2024	6.28	11/06/2024	6.37	0.00	1.91	11.78	0.00	18.30
1	12/06/2024	6.27	12/06/2024	0.00	0.00	0.00	0.00	0.00	0.16
2	26/07/2024	7.48	26/07/2024	0.67	0.00	0.00	1.87	0.00	1.47
2	27/07/2024	7.55	27/07/2024	10.73	0.00	1.06	25.96	0.00	10.20
2	28/07/2024	7.62	28/07/2024	12.87	0.00	0.26	8.27	0.00	4.07
2	29/07/2024	7.68	29/07/2024	4.95	0.00	0.00	0.91	0.00	2.73
2	30/07/2024	7.75	30/07/2024	4.77	0.00	1.03	1.29	0.00	6.97
2	31/07/2024	7.82	31/07/2024	8.96	0.00	0.26	4.48	0.00	3.84
2	01/08/2024	7.88	01/08/2024	5.84	0.00	0.00	1.78	0.00	2.54
2	02/08/2024	7.95	02/08/2024	7.04	0.00	0.00	0.50	0.00	0.88
2	03/08/2024	8.02	03/08/2024	16.47	0.00	0.25	0.00	0.00	2.37
2	04/08/2024	8.08	04/08/2024	0.49	0.00	0.99	0.00	0.00	1.36
2	05/08/2024	8.15	05/08/2024	0.00	0.00	0.00	0.00	0.00	0.12
2	06/08/2024	8.23	06/08/2024	0.00	0.00	0.24	0.00	0.12	0.00
3	14/09/2024	11.20	14/09/2024	0.18	0.09	0.09	0.00	0.09	0.00
3	15/09/2024	11.28	15/09/2024	0.71	0.00	0.00	0.97	1.15	0.00
3	16/09/2024	11.37	16/09/2024	1.06	0.00	0.00	1.50	2.55	0.00
3	17/09/2024	11.43	17/09/2024	0.96	0.00	0.00	1.57	2.27	0.00
3	18/09/2024	11.52	18/09/2024	0.35	0.00	0.00	0.78	1.13	0.00
3	19/09/2024	11.60	19/09/2024	0.43	0.00	0.00	1.47	1.55	0.00
3	20/09/2024	11.68	20/09/2024	0.60	0.17	0.00	1.88	1.20	0.00
3	21/09/2024	11.75	21/09/2024	0.09	0.26	0.00	0.34	0.43	0.00
3	22/09/2024	11.83	22/09/2024	0.17	0.00	0.00	0.34	0.25	0.00
3	23/09/2024	11.92	23/09/2024	0.00	0.08	0.00	0.08	0.08	0.00
3	24/09/2024	11.98	24/09/2024	0.00	0.08	0.00	0.00	0.00	0.00

* Orange = Moderate Activity Level; Red = High Activity Level.

5.3.4 Soprano Pipistrelle

Passes from soprano pipistrelle totalled 700 across all locations and all surveys, forming 22% of the total bat calls. Only 14 calls were recorded at locations 2 and 3 with location 1 and 4 supporting the majority at 222 and 227 respectively.

The distribution of soprano pipistrelle calls across the survey periods was more consistent than that of common pipistrelle with an increase in total number of calls during the autumn period (185 calls recorded in spring, 186 recorded in summer and 329 in autumn). This is the opposite trend to that of common pipistrelle (Figures 5.3.6, 5.3.7 and 5.3.8).

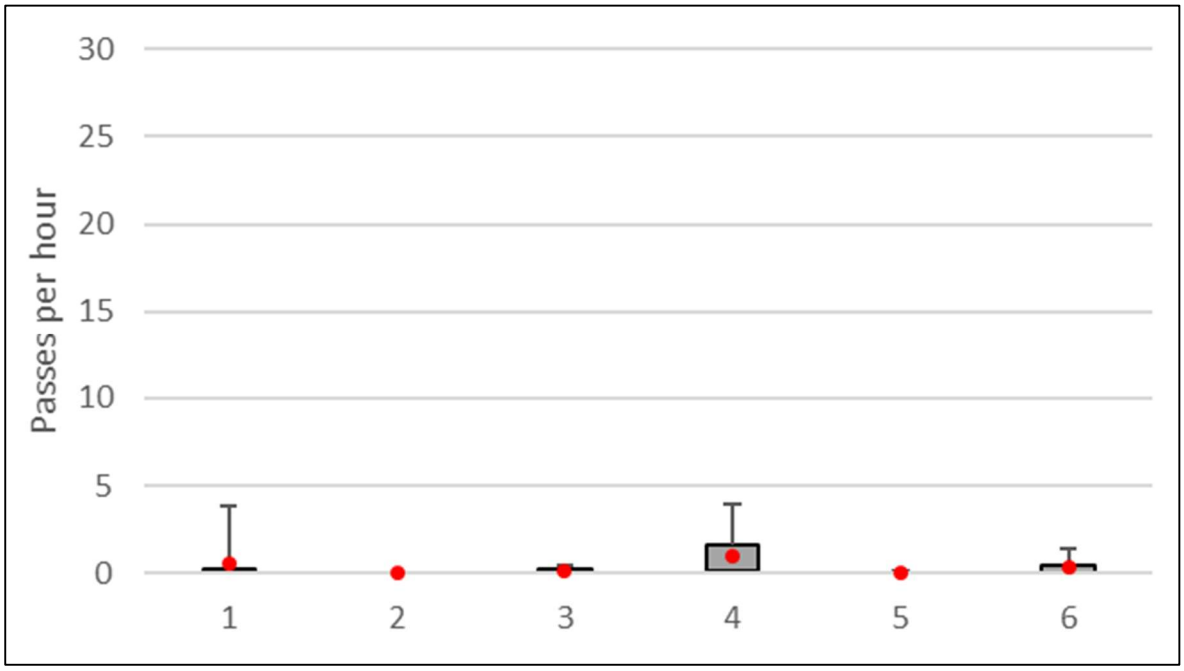

Figure 5.3.6: Boxplot showing the Median Nightly Pass Rate (Bat Passes per Hour) and Mean (Circles) of Soprano Pipistrelle Bats during Survey 1. Data includes Zero Activity Nights

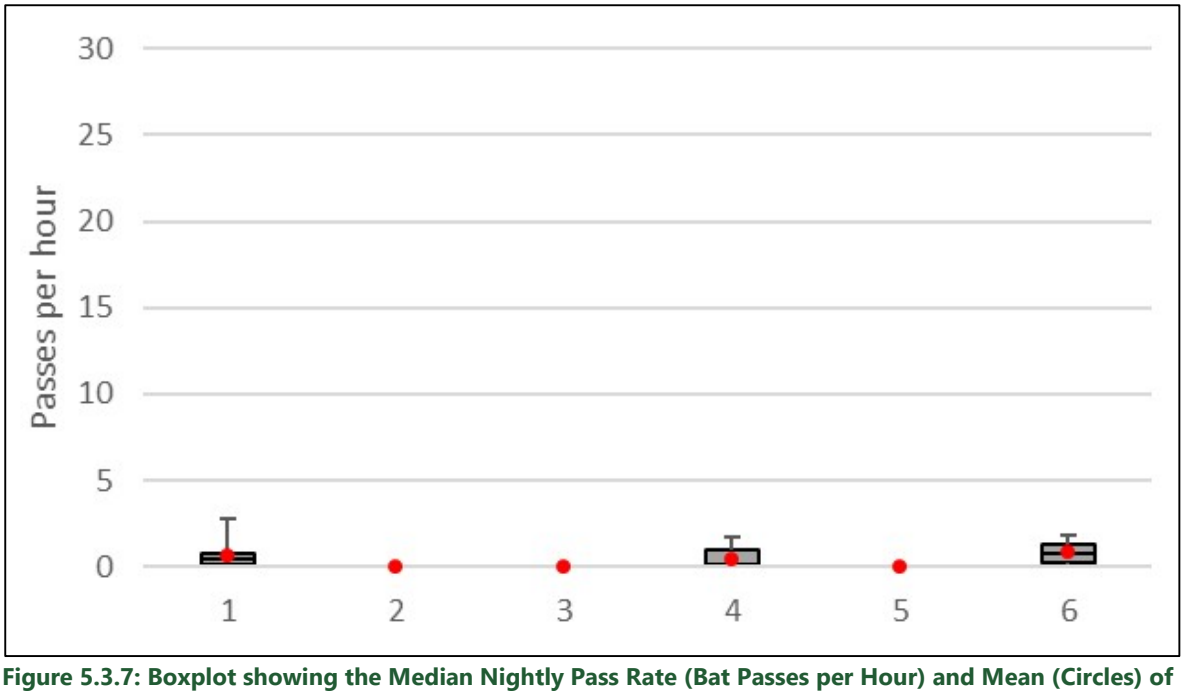

Figure 5.3.7: Boxplot showing the Median Nightly Pass Rate (Bat Passes per Hour) and Mean (Circles) of Soprano Pipistrelle Bats during Survey 2. Data includes Zero Activity Nights

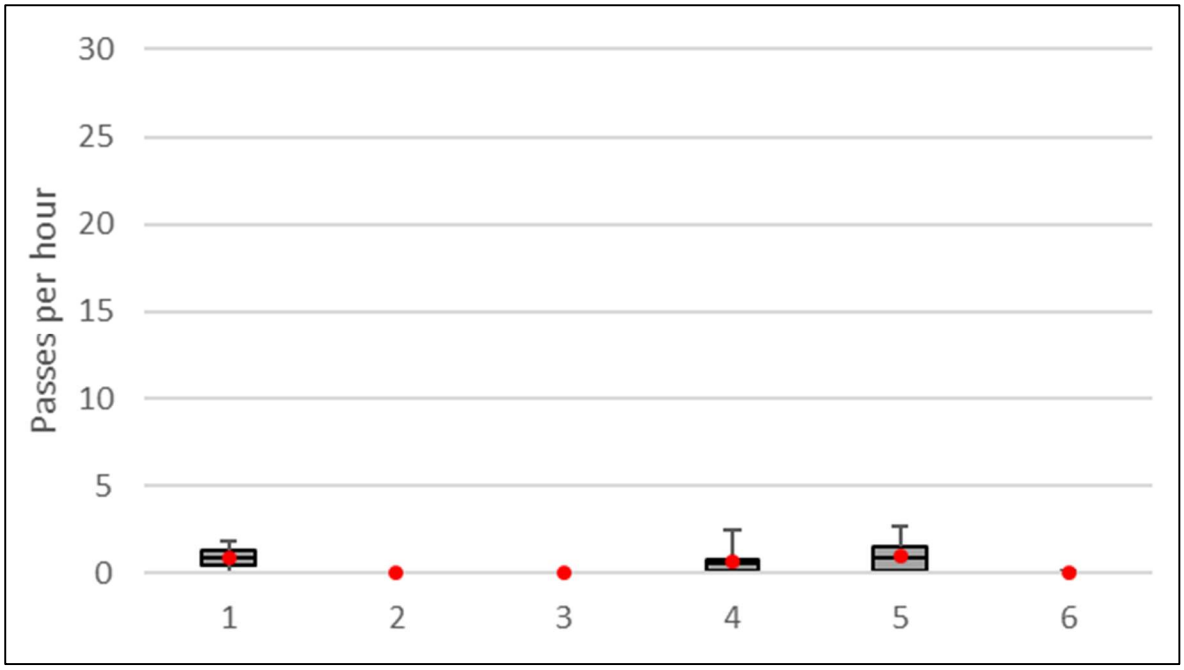

Figure 5.3.8: Boxplot showing the Median Nightly Pass Rate (Bat Passes per Hour) and Mean (Circles) of Soprano Pipistrelle Bats during Survey 3. Data includes Zero Activity Nights

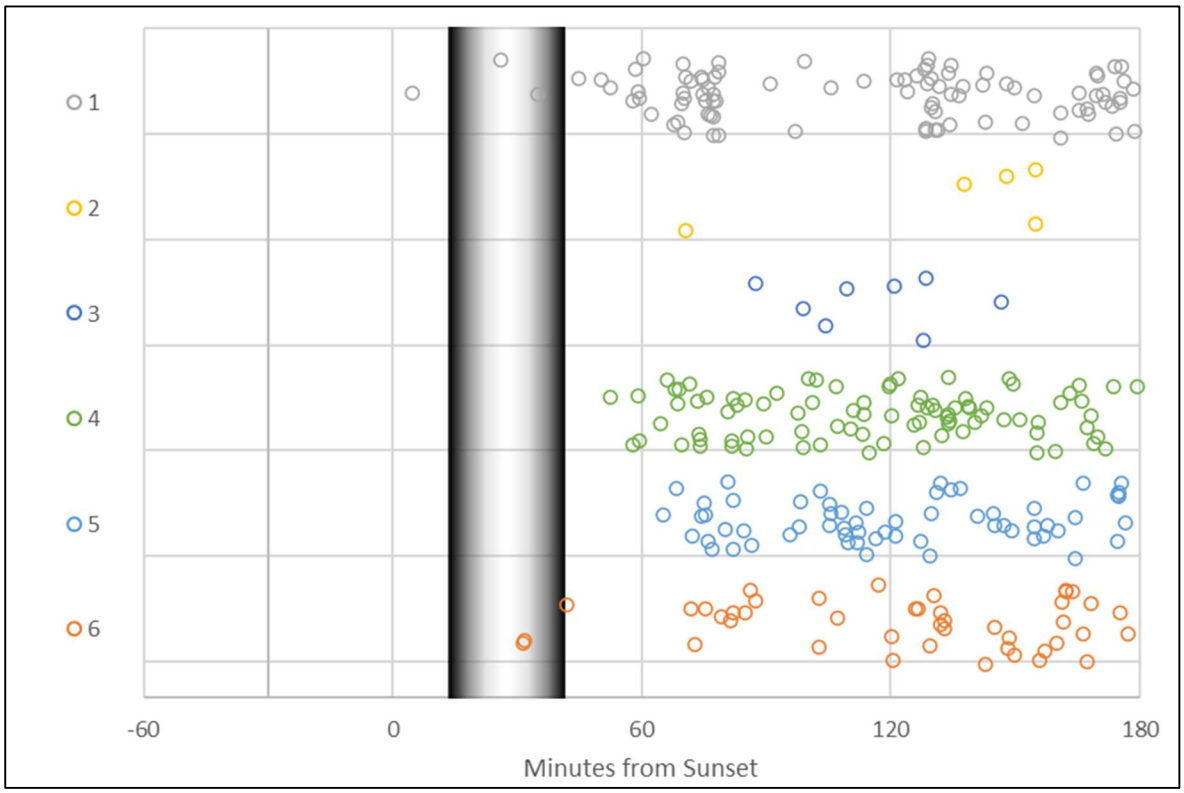

Figure 5.3.9: Temporal Distribution of all Soprano Pipistrelle Calls Recorded within 3 Hours after Sunset in Relation to Time of Sunset across Detector Locations. Grey Section Indicates Recognised Emergence Period

The temporal distribution of soprano pipistrelle in comparison to sunset was very similar to that of common pipistrelle, with a small number of calls recorded prior to, or during the recognised emergence period (Figure 5.3.9). However, with soprano pipistrelle, these early calls

were recorded at locations 1 and 6. All other locations recorded relatively standard activity patterns for commuting and foraging bats with peaks of activity commencing around 1 hour after sunset. Overall, on any given night activity from soprano pipistrelle was low with only seven nights recording moderate activity at one or more of the detector locations (Table 5.3.5).

Table 5.3.5: Activity Rate for each Location across each Night for Soprano Pipistrelle, where Activity was recorded

Survey	Date	Night Length	Date	Location					
				1	2	3	4	5	6
1	30/05/2024	6.68	30/05/2024	0.00	0.00	0.15	0.00	0.00	0.00
1	31/05/2024	6.62	31/05/2024	0.15	0.00	0.30	1.51	0.00	0.00
1	01/06/2024	6.58	01/06/2024	3.80	0.00	0.30	1.67	0.00	1.22
1	02/06/2024	6.53	02/06/2024	2.60	0.00	0.00	2.76	0.00	0.92
1	03/06/2024	6.50	03/06/2024	0.15	0.00	0.00	0.15	0.00	0.00
1	04/06/2024	6.48	04/06/2024	0.00	0.00	0.15	0.15	0.15	0.00
1	05/06/2024	6.45	05/06/2024	0.00	0.00	0.00	0.16	0.00	0.00
1	06/06/2024	6.40	06/06/2024	0.00	0.00	0.00	0.16	0.00	0.00
1	07/06/2024	6.37	07/06/2024	0.00	0.00	0.47	0.16	0.00	0.00
1	08/06/2024	6.35	08/06/2024	0.00	0.00	0.16	0.16	0.00	0.47
1	09/06/2024	6.32	09/06/2024	0.16	0.00	0.00	0.32	0.00	0.16
1	10/06/2024	6.30	10/06/2024	0.63	0.00	0.16	3.97	0.00	0.48
1	11/06/2024	6.28	11/06/2024	0.32	0.00	0.16	3.02	0.00	1.43
1	12/06/2024	6.27	12/06/2024	0.00	0.00	0.00	0.00	0.00	0.00
2	26/07/2024	7.48	26/07/2024	0.00	0.00	0.00	0.13	0.00	0.27
2	27/07/2024	7.55	27/07/2024	0.53	0.00	0.00	1.72	0.00	1.19
2	28/07/2024	7.62	28/07/2024	0.39	0.00	0.00	1.31	0.00	1.44
2	29/07/2024	7.68	29/07/2024	1.43	0.00	0.00	0.13	0.00	0.13
2	30/07/2024	7.75	30/07/2024	0.00	0.00	0.00	0.13	0.00	0.90
2	31/07/2024	7.82	31/07/2024	0.26	0.00	0.00	1.28	0.00	1.79
2	01/08/2024	7.88	01/08/2024	0.13	0.00	0.00	0.89	0.00	1.27
2	02/08/2024	7.95	02/08/2024	0.63	0.00	0.00	0.25	0.00	0.38
2	03/08/2024	8.02	03/08/2024	0.75	0.00	0.00	0.00	0.00	0.75
2	04/08/2024	8.08	04/08/2024	0.99	0.00	0.00	0.00	0.00	1.61
2	05/08/2024	8.15	05/08/2024	2.82	0.00	0.00	0.00	0.00	0.25
2	06/08/2024	8.23	06/08/2024	0.00	0.00	0.00	0.00	0.00	0.00
3	14/09/2024	11.20	14/09/2024	0.63	0.00	0.00	0.00	0.09	0.00
3	15/09/2024	11.28	15/09/2024	1.06	0.00	0.00	0.89	1.06	0.00
3	16/09/2024	11.37	16/09/2024	1.85	0.00	0.00	0.62	2.64	0.00
3	17/09/2024	11.43	17/09/2024	1.49	0.00	0.00	0.70	1.05	0.00
3	18/09/2024	11.52	18/09/2024	0.87	0.00	0.00	0.61	0.87	0.00
3	19/09/2024	11.60	19/09/2024	0.95	0.00	0.00	2.50	2.67	0.00
3	20/09/2024	11.68	20/09/2024	1.54	0.00	0.00	1.88	1.97	0.00
3	21/09/2024	11.75	21/09/2024	0.60	0.09	0.00	0.17	0.34	0.00
3	22/09/2024	11.83	22/09/2024	0.34	0.00	0.00	0.34	0.17	0.00
3	23/09/2024	11.92	23/09/2024	0.08	0.00	0.00	0.08	0.00	0.00
3	24/09/2024	11.98	24/09/2024	0.00	0.00	0.08	0.08	0.08	0.17

* Orange = Moderate Activity Level; Red = High Activity Level.

5.3.5 Other Bat Species

The only other bat species recorded in any numbers was *Myotis* bat. In total, only 15 *Myotis* bat calls were recorded during the entire survey period with recordings predominantly present during the spring survey session and did not show any affinity to any particular location. Furthermore, all but a single call was recorded later than the recognised emergence period.

A single call of brown long-eared bat was recorded at location 1 during the spring survey period.

No detailed analysis of these infrequently recorded species was undertaken due to the very low numbers of passes recorded.

5.4 Bat Activity Surveys

Data from activity surveys provides a snapshot of bat activity and levels of activity recorded on any one survey must be treated with caution and assessed alongside background activity from the static detectors. Activity surveys do, however, provide valuable information in relation to behaviour and context. The data analysed as part of this report relates only to the bat detector recordings and no analysis of night vision aid recordings of field notes has been undertaken. Results are shown in Table 5.4.1.

Table 5.4.1: Summary Results of Activity Surveys

Location	Date	Dawn / Dusk	Sunrise / Sunset	Surveyors	Equipment	Start	Finish	Temperature	Wind Speed and Direction	Precipitation	Comments
1	11/06/2024	Dusk	Sunset at 22:12	Jamie Maxwell	Echo Meter Touch Pro 2, connected to a Samsung Galaxy Tab Active 5 and FLIR T560 with 640x480 pixel lens	21:42	00:15	9 °C	5 mph southwest	None	Dry and cloudy
	06/08/2024	Dawn	Sunrise at 05:32	Ffion Maguire	Echo Meter Touch Pro 2, connected to a Samsung Galaxy Tab Active 5 and FLIR T640 with 640x480 pixel lens	03:32	05:47	9 °C	3 mph northeast	None	Partly cloudy and light winds
	23/09/2024	Dusk	Sunset at 19:16	Ffion Maguire	Echo Meter Touch Pro 2, connected to a Samsung Galaxy Tab Active 5 and FLIR T865 with 640x480 pixel lens	18:45	21:15	13 °C	3 mph east	None	Drizzle and light winds

Location	Date	Dawn / Dusk	Sunrise / Sunset	Surveyors	Equipment	Start	Finish	Temperature	Wind Speed and Direction	Precipitation	Comments
2	11/06/2024	Dusk	Sunset at 22:12	Ffion Maguire	Echo Meter Touch Pro 2, connected to a Samsung Galaxy Tab Active 5 and FLIR T865 with 640x480 pixel lens	21:42	00:15	9 °C	5 mph southwest	None	Light winds
	06/08/2024	Dawn	Sunrise at 05:32	Jamie Maxwell	Echo Meter Touch Pro 2, connected to a Samsung Galaxy Tab Active 5 and FLIR T865 with 640x480 pixel lens	03:32	05:47	9 °C	3 mph northeast	None	Cool and dry with a breeze
	23/09/2024	Dusk	Sunset at 19:16	Jamie Maxwell	Echo Meter Touch Pro 2, connected to a Samsung Galaxy Tab Active 5 and FLIR T640 with 640x480 pixel lens	18:45	21:15	13 °C	3 mph east	None	Calm and dry
3	12/06/2024	Dawn	Sunrise at 04:29	Ffion Maguire	Echo Meter Touch Pro 2, connected to a Samsung Galaxy Tab Active 5 and FLIR T865 with 640x480 pixel lens	02:27	04:57	6 °C	2 mph southeast	None	Clear sky with light winds

Location	Date	Dawn / Dusk	Sunrise / Sunset	Surveyors	Equipment	Start	Finish	Temperature	Wind Speed and Direction	Precipitation	Comments
3	05/08/2024	Dusk	Sunset at 20:59	Jamie Maxwell	Echo Meter Touch Pro 2, connected to a Samsung Galaxy Tab Active 5 and FLIR T865 with 640x480 pixel lens	20:50	23:20	11 °C	2 mph northeast	None	Still and dry
	24/09/2024	Dawn	Sunrise at 07:11	Ffion Maguire	Echo Meter Touch Pro 2, connected to a Samsung Galaxy Tab Active 5 and FLIR T865 with 640x480 pixel lens	05:10	07:41	9 °C	2 mph southeast	None for first hour and then light rain	Light rain showers and wind
4	12/06/2024	Dawn	Sunrise at 04:29	Jamie Maxwell	Echo Meter Touch Pro 2, connected to a Samsung Galaxy Tab Active 5 and FLIR T560 with 640x480 pixel lens	02:27	04:57	6 °C	2 mph southeast	None	Calm and dry
	05/08/2024	Dusk	Sunset at 21:23	Ffion Maguire	Echo Meter Touch Pro 2, connected to a Samsung Galaxy Tab Active 5 and FLIR T640 with 640x480 pixel lens	20:50	23:20	11 °C	2 mph northeast	None	Light cloud and light winds

Location	Date	Dawn / Dusk	Sunrise / Sunset	Surveyors	Equipment	Start	Finish	Temperature	Wind Speed and Direction	Precipitation	Comments
4	24/09/2024	Dawn	Sunrise at 07:11	Jamie Maxwell	Echo Meter Touch Pro 2, connected to a Samsung Galaxy Tab Active 5 and FLIR T640 with 640x480 pixel lens	05:10	07:41	9 °C	2 mph southeast	None for first hour and then light rain	Light rain showers and wind

During the spring surveys no bats were identified during dusk or dawn surveys. No activity was recorded at Location 3 in the northeast corner of the bat activity survey area. The summer and autumn surveys recorded bats at the remaining three locations. Overall, only two species were recorded, common pipistrelle and soprano pipistrelle with the former being the dominant, comprising over 70% of all passes recorded. A summary of the recordings is detailed in Table 5.4.2 and shows that in total 160 passes by pipistrelle bats were recorded with the summer survey occasions resulting in the majority of activity.

Table 5.4.2: Summary Results of Activity Surveys

Season	Location and Survey Period	Number of Passes (Active Minutes)		
		Common Pipistrelle	Soprano Pipistrelle	Total
Spring	BAS Location 1 – Dusk	0 (0)	0 (0)	0 (0)
	BAS Location 2 - Dusk	0 (0)	0 (0)	0 (0)
	BAS Location 3 - Dawn	0 (0)	0 (0)	0 (0)
	BAS Location 4 - Dawn	0 (0)	0 (0)	0 (0)
Summer	BAS Location 1 – Dawn	9 (8)	2 (2)	11 (10)
	BAS Location 2 - Dawn	42 (19)	7 (6)	46 (25)
	BAS Location 3 - Dusk	0 (0)	0 (0)	0 (0)
	BAS Location 4 - Dusk	32 (14)	23 (10)	55 (24)
Autumn	BAS Location 1 – Dusk	6 (4)	7 (6)	13 (10)
	BAS Location 2 - Dusk	24 (16)	9 (8)	33 (24)
	BAS Location 3 - Dawn	0 (0)	0 (0)	0 (0)
	BAS Location 4 - Dawn	2 (2)	0 (0)	2 (2)
Location Totals	BAS Location 1 - All	15 (12)	9 (8)	24 (20)
	BAS Location 2 – All	66 (35)	16 (14)	82 (49)
	BAS Location 3 – All	0 (0)	0 (0)	0 (0)
	BAS Location 4 - All	34 (16)	20 (10)	54 (26)
Seasonal Totals	Spring	0 (0)	0 (0)	0 (0)
	Summer	83 (41)	29 (18)	112 (59)
	Autumn	32 (22)	16 (14)	48 (36)
TOTAL		**115 (63)**	**45 (32)**	**160 (95)**

Although 160 passes were recorded, when considering the number of minutes of activity time supporting at least one pass by a bat only 95 active minutes were recorded. The fact that during surveys only a single bat was ever observed at any one time it is likely that these multiple recordings within any one-minute period are from a single bat with repeated activity in the vicinity of the surveyor, rather than multiple bats. This assessment was also confirmed by the review of the thermal imaging videos. Although it should be noted that it still cannot be confirmed that subsequent flights from individual bats were the same or different individuals.

The review of the thermal imaging videos supported a similar pattern of activity with many of the passes recorded by the handheld detectors observed within the thermal imaging. However, as the field of view of the cameras were limited, only a proportion of bat detector registrations were within view. In addition, a small number of observations of bats were undertaken by thermal imaging, only where the bat was at distance and echolocation was not picked up by the handheld detector. The thermal imaging results did, however, provide some information on the number of bats present at any one time and a broad indication of direction of movement. Overall, only a single bat was observed to be commuting or foraging at any one

time and most of the activity identified consisted of brief spells of foraging over the canopy or along the western woodland edges. Although no activity was recorded by the handheld detectors during the activity surveys in spring, a small number of probable bat flights (5), were detected at Location 1, high above the canopy over a period of approximately 20 minutes.

The thermal imaging videos did not identify significant activity at any of the locations with only a small number of passes confirmed as bats identified. These were restricted to 1, 3 and 4, although this is largely due to the field of view being larger at these locations.

Overall, activity rates across the different surveys were not high although bat activity was frequent at most locations. No activity was recorded within the recognised emergence time periods, with most passes recorded in excess of 1 hour after sunset or before sunrise. Activity appears to be greater along the western side of the bat activity survey area with the southwest and northwest locations accounting for 85% of all bat passes.

6 Discussion

The surveys at Corran were undertaken to assess the potential impacts of any proposed development which is anticipated to result in loss of woodland habitat. The woodland habitat is likely to represent suitable foraging habitat, especially the lochside woodland edge. However, usage of these relatively exposed locations is likely to be heavily weather dependent, for example, wind would be expected to largely impact upon usage.

No confirmed roosts were identified within the bat activity survey area, although a significant number of trees were identified as offering low suitability, with only one tree within the Nether Lochaber development site expected to offer moderate suitability. In general, the woodland was relatively dense and although a number of small openings are present the majority of bat activity is likely to be along the western edge bordering the loch. The eastern edge which supports the busy A82 public road is unlikely to be favoured by bats due to risk of collisions with traffic and impact from car headlights.

Activity levels during the static detector surveys also suggest that the western lochside edge of the woodland is indeed the most used, with activity within the woodland glades or more open areas beneath the canopy not heavily used by foraging bats. This would be expected as the eastern side of the woodland is located on the busy main road (the A82) and extensive use of this area would not only potentially result in collisions with traffic, but also have reduced prey base. Knowledge of how bats use intertidal zones is not well understood, however, insect prey base is likely to be relatively high along the western edge of the woodland, which reaches up to the rocky intertidal zone of Loch Linnhe.

Overall, the species composition and richness are typical of northern Scotland with the activity dominated by common and soprano pipistrelle with less frequent presence of *Myotis* bat and occasional brown long-eared bat. It is possible that brown long-eared bat presence is under-represented within the static data as the species uses low power calls for foraging and the microphones are less likely to identify the calls in comparison to pipistrelles.

Activity rates were generally low with the most active location identifying a mean of just 2.9 bat passes per night (Static Location 1). Bat activity was not uniform, with some nights supporting far higher activity, however, based on the comparative assessment undertaken by Ecobat, the activity by pipistrelle and *Myotis* bats was identified as being low/moderate at its

highest, with a max percentile of 24 across all surveys. The identification of brown long-eared bats also being present at moderate levels is likely to be based on the low reference range for the species, rather than the bat activity survey area being moderately important for the species.

When assessing the geographical variation within the bat activity survey area, Static Locations 1, 3 ,4 and 6 appear to support the most activity, with very little activity at Static Locations 2 and 5. This strongly suggests that the edge habitat of the bat activity survey area is used to a greater extent than the interior of the woodland, even when considering the more open areas within the woodland where the static detectors were placed.

The temporal data also suggests that although a small number of calls were recorded prior to the recognised emergence times of pipistrelle bats, the vast majority were recorded greater than 60 minutes afterwards. This may indicate that a small bat roost is close to locations 1 and 3 in particular, although as the number of registrations is very small, it is possible that any roost that may be present is not regularly used and likely to be used by a single bat at best. Through interrogating the data, the seven occasions that common pipistrelle were recorded early were on six different nights, rather than a single night. It may be the case that suitable trees within proximity to these locations support infrequent use by common pipistrelle for roosting and this may influence whether trees identified with potential roost features are subject to further surveys.

Although the activity across the site was low, it was highly variable with some nights supporting 'high' activity as defined in Table 4.2.1. This is likely to be depending on whether conditions and in general overall activity rates should be used as a measure, but periods of increased use do highlight that the habitat is of some importance from a commuting and/or foraging point of view.

Further support for the reduced activity within the woodland itself and along the eastern edge comes from the results of the activity surveys accompanied by night vision aid thermal imaging. These surveys also confirmed no activity in the northeast of the site with low activity rates in the southeast. Although higher activity rates were observed along the western edge of the woodland, this activity was still relatively low and, based on results, did not support high numbers of individual bats with activity limited to short bouts of foraging from a small number of pipistrelle bats.

7 Conclusion

Based on the findings of the bat survey works it is expected that the woodland situated in the north of the Nether Lochaber development site is supporting a small population of a bat species assemblage of regional importance. It is expected that the woodland is largely used by foraging and commuting bats only. The results of the activity surveys suggest that there may be bat roosts within the woodland, although they are expected to be used infrequently and by 1 individual bat at a time at most. Hence, when considering the findings of the PRA and bat activity surveys, it is expected that all trees within the woodland are generally of low suitability for bat roosting, with the exception of one tree situated towards the east of the woodland, which is anticipated to have moderate suitability for roosting bats.

All other areas within the CFIIS development boundary were considered to be of negligible suitability for roosting bats, although it was considered likely that there would be infrequent usage by foraging and commuting bats.

The findings of the bat survey works are considered to be appropriate to determine the value of the population of bats within the CFIIS development boundary and determine usage of the available habitats. Hence, the results are considered to be appropriate to inform an impact assessment. However, additional survey works will be required prior to development in order to specify whether a bat licence will be required, and to collect appropriate data to inform a licence application (if necessary). Based on the findings of the bat survey works, it is expected that some supervision by a licenced bat worker, particularly during the removal of the woodland, will be required.

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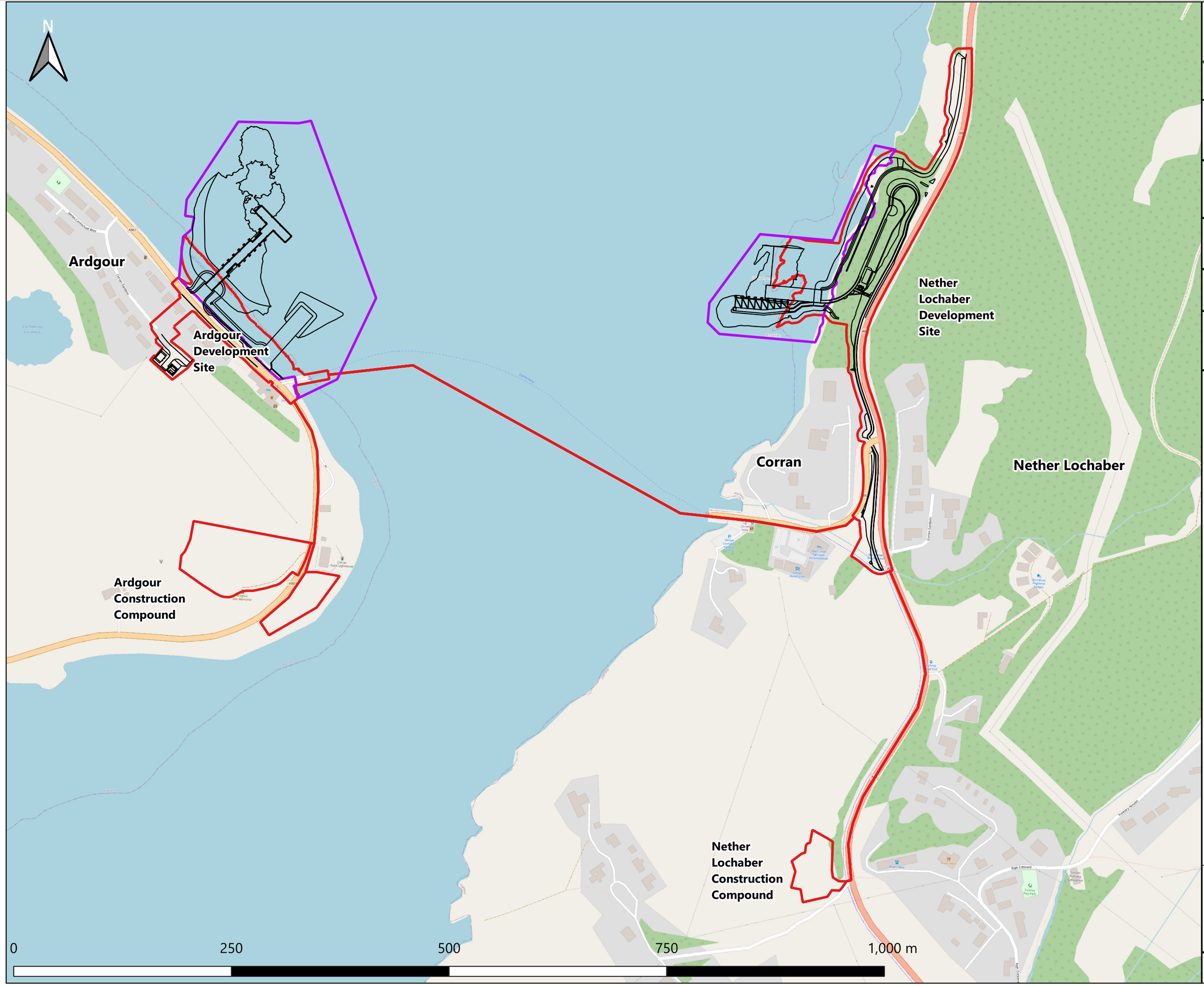
9 Glossary

Acronym	Definition
BCT	Bat Conservation Trust
CFIIS	Corran Ferry Infrastructure Improvement Scheme
CIEEM	Chartered Institute of Ecological and Environmental Management
DEFRA	Department for Environment, Food and Rural Affairs'
EIA	Environmental Impact Assessment
EPS	European Protected Species
INNS	Invasive Non-native Species
km	kilometres
km/h	kilometres per hour
m	metres
m/s	metres per second
NBN	National Biodiversity Network
PEA	Preliminary Ecological Appraisal
PRA	Preliminary Roost Assessment
PRF	Potential Roosting Feature
THC	The Highland Council
WAV	Waveform Audio File Format
°C	Degrees Celsius
%	Percent

Drawings



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Title: 99_DRG_C2_1 CFIIS Planning and Marine Licence Boundaries

Projection: OSGB 1936/British National Grid
EPSG: 27700

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Legend

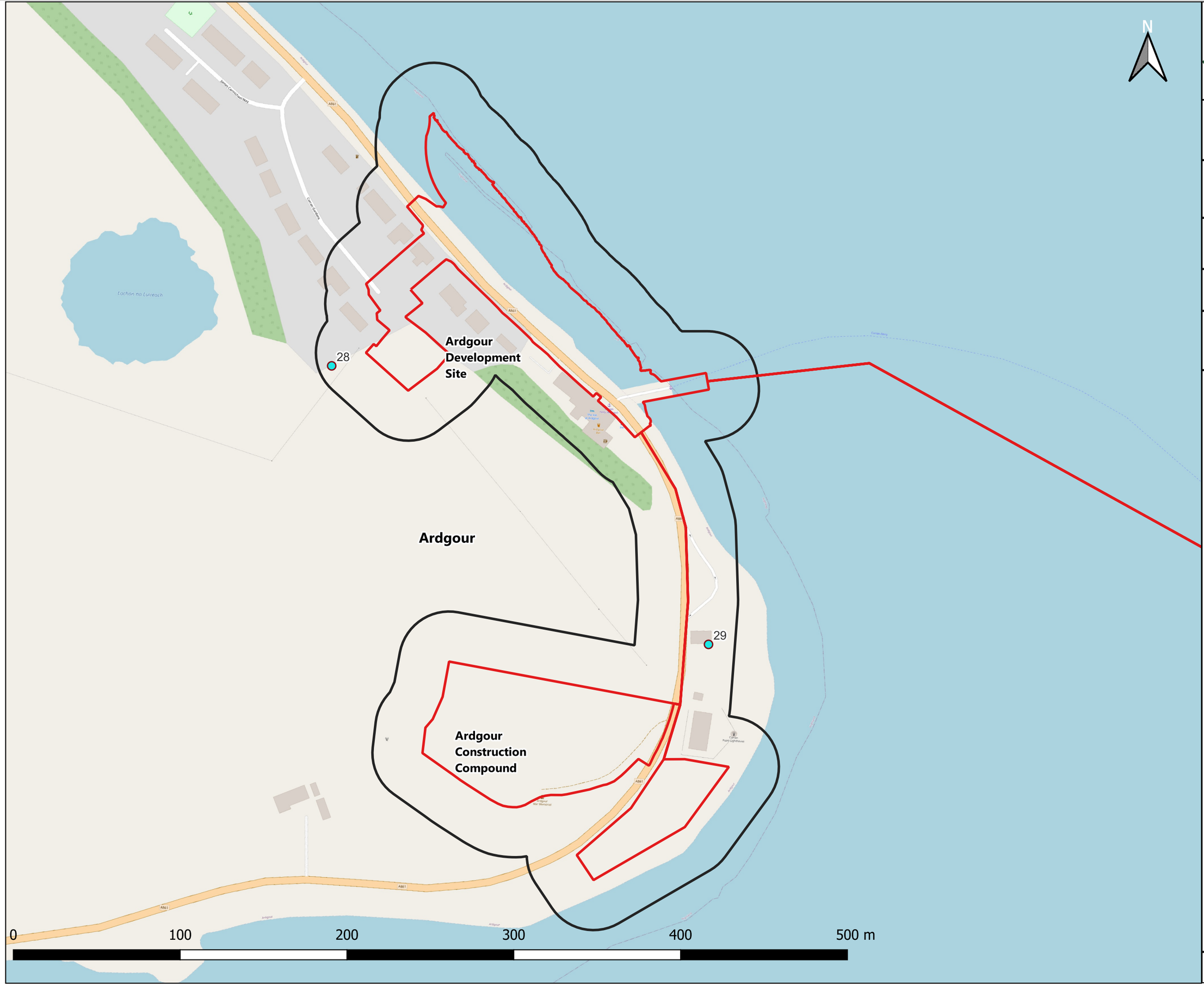
- Marine Licence Boundary
- Planning Boundary
- Proposed Infrastructure

Area Size (hectare)

Marine Licence Boundary: 10.2518 ha

Planning Boundary: 5.48 ha

Page 1	Rev No: 3	Drawing Date: 06/02/2025



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Title: 99_DRG_24_1 Ardgour Preliminary Roost Assessment

Projection: OSGB 1936/British National Grid
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Legend

Planning Boundary

CFIIS Bat Data

Bat

30m Bat All Site

N

Nether Lochaber Development Site

Corran

Nether Lochaber

Nether Lochaber Construction Compound

Sgeir Chomnard

An Dulan

A82

0 250 500 750 m

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Title: 99_DRG_25_1 Nether Lochaber Preliminary Roost Assessment

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Legend

Planning Boundary

CFIIS Bat Data

Bat

30m Bat Buffer

N

SBD 4
SBD 3
BAS 3
BAS 4
SBD 2
SBD 5
Nether Lochaber Development Site
BAS 2
SBD 6
SBD 1
BAS 1

0
250
500 m

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Title: 99_DRG_26_1 Nether Lochaber Bat Activity Surveys

Projection: OSGB 1936/British National Grid
EPSG: 27700

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Legend

- Planning Boundary
- Bat Survey Area

Ecological Survey Equipment

- Static acoustic detector
- Thermal camera & Surveyor with Bat Detector

Corran Ferry Infrastructure Improvement Scheme

Appendix K.4: Protected Species Survey Report

Wallace Stone
Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

Corran Ferry Infrastructure Improvement Scheme

Protected Species Survey Report

Wallace Stone
Consulting Civil Engineers

For

The Highland Council
Comhairle na Gàidhealtachd

Report No. 99_REP_19

Date: 20/12/2024

Document Control

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1 Introduction

The Highland Council (THC) are proposing to upgrade the existing ferry terminals at the Corran Narrows under the Corran Ferry Infrastructure Improvement Scheme (CFIIS). The scheme will involve the construction of new infrastructure in the village of Ardgour, and just north of the Corran settlement in the region of Nether Lochaber, to facilitate the introduction of a new electric vessel for the ferry service and improve facilities for users and operators of the Corran Ferry.

Wallace Stone, as the principal engineering consultants to THC, appointed Affric Limited (hereafter referred to as 'Affric') to undertake ecological surveys of the proposed development site of the CFIIS. The purpose of the ecological survey works was to inform the project design and Environmental Impact Assessment (EIA). In particular, to determine which protected species are likely to be ecological receptors of the CFIIS and provide evidence of the sensitivity of those receptors within the development boundary.

The target species of the protected species survey included badger (*Meles meles*), pine marten (*Martes martes*), red squirrel (*Sciurus vulgaris*) and otter (*Lutra lutra*), as potential for these species to be present within the development boundary was identified during the initial Preliminary Ecological Appraisal (PEA) (Affric, 2022). Where evidence of any other protected species (including fauna and flora) was identified opportunistically, it was also recorded. It should be noted that the potential for bats to be present within the development boundary was also identified during the PEA (Affric, 2022), however bats are excluded from this survey report, as the results of bat surveys are outlined within a separate report (Affric, 2024a).

The protected species surveys for badger, pine marten, red squirrel and otter involved the completion of in-depth site walkovers by competent and experienced ecologists from Affric (hereafter referred to as 'site survey'). The initial protected species site survey was undertaken in 2023, based on the proposed development boundary at that time. However, due to later alterations to the development boundary, associated with a slight change in design, an additional site survey was completed in 2024 to capture sufficient ecological data for the updated site layout to inform the EIA.

In addition, to the site surveys, the protected species surveys involved periods of camera trapping in 2023 and 2024, for potentially important ecological features that required additional investigation.

This report presents the data and results of the protected species surveys undertaken during 2023 and 2024. This report succeeds the CFIIS Protected Species Survey Report (Affric, 2024b) produced in April 2024 (Affric, 2024b), which only presents the results of surveys completed during 2023.

2 Survey Site Description

2.1 Survey Area Location

The CFIIS development boundary is comprised of four distinct land parcels, which run alongside either side of Loch Linnhe, through the settlements of Nether Lochaber and Ardgour. Two of the land parcels are situated in Nether Lochaber, including the Nether Lochaber development site and the Nether Lochaber construction compound site (collectively

referred to as the 'Nether Lochaber planning boundary' hereafter) (as shown in Drawing 99_DRG_21_2). The other two land parcels are situated in Ardgour, including the Ardgour development site and the Ardgour construction compound site (collectively referred to as 'Ardgour planning boundary' hereafter) (as shown in Drawing 99_DRG_20_2).

All four of the land parcels associated with the CFIIS are connected within the planning applications red line boundary (see Drawings 99_DRG_20_2 and 99_DRG_21_2). However, it is worth noting that the connective corridors are delineated solely for administrative purposes to create a single boundary appropriate for the planning application. Therefore, these connective corridors are not considered within the protected species survey works, as no development works associated with the CFIIS are proposed within these areas.

Additionally, as the Nether Lochaber and Ardgour planning boundaries are separated by Loch Linnhe (i.e., a significant barrier, which is impenetrable by most terrestrial species), the two planning boundaries will be considered separately for protected species, with the exception of otter, which would be expected to move freely between the two.

2.2 Habitats

The four land parcels incorporate habitats and infrastructure associated with a coastal village. The Nether Lochaber development site is comprised, in-part, by a sub-urban landscape made up of residential and commercial buildings with associated hard and soft landscaping. In the surrounding areas, plant communities associated with woodland, grassland, scrub, and heathland habitats are present (see Drawing 99_DRG_03_1). Whilst the Nether Lochaber construction compound site is comprised of degraded bog and hard standing.

The Ardgour development site is predominantly sub-urban, due to existing residential and commercial development, although coastal margins and agricultural land provide some semi-natural habitat (see Drawing 99_DRG_03_1). The Ardgour construction compound is largely comprised of agricultural land with some areas of hard standing.

Invasive non-native species (INNS) have been recorded in both Nether Lochaber and Ardgour. Rhododendron (*Rhododendron ponticum)* has become a significant problem within both Nether Lochaber and Ardgour, dominating much of the existing habitats. A large stand of Japanese knotweed (*Fallopia japonica*) was identified in 2022 within the broadleaved woodland, situated towards the north of the Nether Lochaber development site (Affric, 2022). During the surveys in 2024, additional Japanese knotweed plants were recorded within the woodland, and it was noted that Japanese knotweed plants were also within close proximity to the boundary of the Ardgour development site and Ardgour construction compound site. Montbretia (*Crocosmia x crocosmiiflora*) was also identified towards the north of the Nether Lochaber development site, during the surveys in 2024. All three INNS are listed within Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) (WCA) (for further detail please see Appendix 3: Relevant Legislation).

For further detail on the habitats situated within the survey areas, please refer to the Phase 1 Habitat Map and corresponding PEA Report (Affric, 2022).

3 Overview of Relevant Legislation

Otter are a European Protected Species (EPS), and therefore receive full protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (commonly known as the 'Habitat Regulations').

Badgers are a protected species under The Protection of Badgers Act 1992, as amended by the Wildlife and Natural Environment (Scotland) Act 2011.

Pine marten and red squirrels are protected under the WCA. Both of these species are also listed within the Highland Nature Biodiversity Action Plan (HNBAP) (THC *et al.*, 2022).

A Protected Species Licence or EPS Licence (dependent on species legislation) may be issued by NatureScot to allow individuals to carry out certain actions that could otherwise constitute an offence. For example, construction activity with potential to disturb protected species. Licence applications should be supported by suitable survey reports for the species in question, a Species Protection Plan (SPP) to minimise impacts to individuals and completed relevant licence application forms.

For further details on relevant legislation, please see Appendix 3: Relevant Legislation.

4 Methodology

4.1 Desktop Study

A data collection exercise (desktop study) for protected species was initially undertaken as part of the PEA process in August 2022 (Affric, 2022). This desktop study was then updated in 2023 as part of the initial protected species survey works (Affric, 2024b), and again in 2024, due to the time lapse since the protected species survey works in 2023. During the desktop study, data was obtained from a variety of sources. Information on statutory sites including location, citations and conservation objectives was obtained from NatureScot's online portal 'SiteLink' (NatureScot, 2024) and the Department for Environment, Food and Rural Affairs' (DEFRA) online portal 'DEFRA MAGIC' (DEFRA, 2024). Commercially available data records of protected species, previously identified within the Nether Lochaber and Ardgour planning boundaries, or within 2 kilometres (km) of the sites, were obtained from the National Biodiversity Network (NBN) Atlas (NBN, 2024). Aerial photography from Google Maps was also utilised to allow for an assessment of potential connectivity between the Nether Lochaber and Ardgour planning boundaries and habitats within the wider locality (Google, 2024).

4.2 Site Survey

Site surveys were carried out by competent and experienced ecologists from Affric. Site surveys were carried out within all suitable habitats for the target species (i.e., badger, pine marten, red squirrel and otter) within the Nether Lochaber and Ardgour planning boundaries and appropriate species-specific buffer areas (as described in Table 4.1 and shown in Drawings 99_DRG_20_2 and 99_DRG_21_2). Species-specific buffer areas were determined by relevant guidance from NatureScot.

Table 4.1: Species-specific Buffer Areas Surveyed During the Site Survey

Receptor	Additional Buffer Area
Badger	100m
Pine marten	250m
Red squirrel	50m
Otter	200m

A site survey for badger, pine marten and red squirrel was initially carried out on 24th May 2023 and 16th August 2023 for the Nether Lochaber and Ardgour planning boundaries and species-specific buffer areas. A further site survey was undertaken on 15th and 26th July 2024 to include areas associated with the altered development boundary. An otter survey was initially carried out on 24th May 2023, with additional areas associated with the altered development boundary surveyed on 26th July 2024.

Where field signs indicative of a target species were identified (including important ecological features), they were recorded and mapped as field records (see Drawings 99_DRG_20_2 and 99_DRG_21_2). In the instance that evidence of a protected species was recorded outside of the development boundary or associated species-specific buffer area, it was still recorded and mapped, in order to provide additional context to the spatial distribution of the species throughout the wider locality.

Where evidence of other protected species was identified opportunistically, it was recorded and mapped, to provide further understanding of the ecological nature of the Nether Lochaber and Ardgour planning boundaries and ensure that all potential ecological receptors were captured.

4.2.1 Badger

The site survey for badger was carried out in line with Scottish Badgers 'Surveying for Badgers, Good Practice Guidelines' (Scottish Badgers, 2018) and THC's 'Best Practice Guidance – Badger Surveys' (THC, 2006) within the Nether Lochaber and Ardgour planning boundaries and a 100m buffer (see Table 4.1 and see Drawings 99_DRG_20_2 and 99_DRG_21_2). Due to the nocturnal nature of badger, surveys relied on the interpretation of field signs rather than direct observation of the animals themselves.

Field signs (where identified) were recorded and mapped. Field signs indicative of badger activity include:

- Setts;
- Day beds;
- Latrines;
- Signs of foraging, such as snuffle holes;
- Pathways;
- Scratching posts;
- Hairs; and
- Footprints.

Sett entrances are generally photographed and mapped, with each sett entrance being classified as Well Used (WU), Partially Used (PU) or Disused (D). Where applicable, sett entrances would be grouped and categorised as a main sett, annex sett, subsidiary sett, or outlier sett, in accordance with survey guidelines (Scottish Badgers, 2018). No badger setts

were identified during these survey works (see Section 5.1: Badger), although it would be expected that this methodology would be utilised if such a feature was identified during any future works.

4.2.2 Pine Marten and Red Squirrel

The site survey for pine marten and red squirrel was undertaken as per the 'UK Biodiversity Action Plan (BAP) Mammals Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation' (Cresswell *et al.*, 2012) within the Nether Lochaber and Ardgour planning boundaries. In addition, suitable habitats within 250m of the Nether Lochaber and Ardgour planning boundaries were surveyed for pine marten, whilst habitats within 50m were surveyed for red squirrel (see Table 2.1 and see Drawings 99_DRG_20_2 and 99_DRG_21_2). During the site survey, a search for field signs indicative of pine marten (i.e., scats, prints and den sites) and red squirrel (i.e., animal sightings, dreys, and feeding signs, such as pinecones and caches) was undertaken. Field signs indicative of either species, or feature identified to have potential suitability to support a pine marten den and/or red squirrel drey were recorded and mapped for further investigation.

4.2.3 Otter

The otter survey was undertaken in accordance with the approach detailed by NatureScot's 'Standing Advice for Planning Consultations - Otters' (NatureScot, 2024) and the guidance provided in 'Ecology of the European Otter' (Chanin, 2003). All accessible areas considered to be appropriate for otter, located within the Nether Lochaber and Ardgour planning boundaries or 200m buffer area (see Table 4.1 and see Drawings 99_DRG_20_2 and 99_DRG_21_2) were surveyed, with the survey works concentrating on coastal margins and rock armour.

Due to the often-elusive nature of otters, surveys relied on the interpretation of field signs rather than direct observation of the animals themselves. During the survey the following field signs were sought, with those which can be regarded as definitive, i.e., they provide certain confirmation of the presence of this species, marked with an asterisk:

- Spraints (faeces)*;
- Feeding remains (partially eaten prey items);
- Holts (den);
- Footprints*;
- Couches or Lay-Ups (resting place above ground) and
- Pathways and slides into water.

Where necessary, field signs indicative of otter were recorded and mapped for further investigation.

4.3 Camera Trapping

Where further investigation of potentially important ecological features was considered to be necessary, camera traps (i.e. motion-sensor infra-red cameras) were installed to determine whether the features were in use by protected species. During these survey works, camera traps were installed to monitor features considered to have potential for pine marten and otter.

Camera traps were installed with full visibility of the feature, and, where deemed necessary, multiple cameras were used to capture the feature at different angles. Care was taken to ensure

that there were no animals present at the time of installation and that the location of the traps would not impede upon, or disturb, any animals utilising the features. Furthermore, camera traps were installed by competent and experienced ecologists.

Camera traps were installed for periods in late summer 2023 (otter) and summer – autumn of 2024 (otter and pine marten). The locations of camera traps installed are shown on Drawings 99_DRG_22_2 and 99_DRG_23_2. The camera traps were installed for three week periods at each location.

Camera trap footage was analysed by competent and experienced ecologists. Evidence of protected species identified during the assessment of the camera trap footage is provided in Appendix 2.

4.4 Limitations

The broadleaved woodland situated towards the north of the Nether Lochaber development site had a dense understorey with rhododendron. This made some areas of the woodland inaccessible, however a search for evidence of animal tracks coming in and out of dense areas of woody vegetation was undertaken to determine whether there was likely to be any frequent usage. Towards the north of the woodland there is a large area of windblown conifers. Due to safety constraints and inaccessibility of walking beneath fallen trees, the extent of the area could not be surveyed entirely. However, multiple cameras were utilised during the camera trapping period to ensure that any animals leaving or entering the area would be identified. In addition, areas containing Japanese knotweed were avoided to prevent potential for accidental spread of INNS. Nonetheless, the target species were not generally expected to favour stands of Japanese knotweed and no animal tracks were identified going in/out of large stands.

Coniferous woodland towards the east of the Nether Lochaber development site was largely inaccessible due to the density of the understorey and the steep topography. Where possible an assessment of these habitats and their suitability for protected species was made from accessible areas of the forest edge, which allowed the surveyors to look through into the forest and from vantage points higher up the hill, looking down into the habitat. Furthermore, it should be noted that this area of coniferous woodland is separated from the Nether Lochaber development site by the A82, a busy public highway. Thus, the survey data captured was considered to be appropriate in determining the potential for protected species that could range within the Nether Lochaber development site, with the assumption that any important ecological features located up above the site on the other side of the A82 would be unlikely to be affected by the proposed works.

A small lochan at the rear of Corran Gardens (Lochan na Luireach) was inaccessible during the survey for otter, due to dense vegetation around the entire perimeter. No signs of access to the lochan were found within the vegetation. A dry stream bed exited the Lochan behind the residential housing, however this terminated at a silted culvert and was therefore not considered to provide a suitable pathway for otter to the lochan.

Due to the public nature of the sites at Ardgour and Nether Lochaber and the locations of the recorded field signs, it was required to place survey cameras in public places (see Section 4.3: Camera Trapping). Although cameras are usually dark in colour or camouflaged to help them blend into their background, this presents a risk that they may be removed or stolen.

Unfortunately, two cameras were stolen during the camera trapping period, including one from the Ardgour development site and one from the Nether Lochaber development site. This resulted in the survey footage being lost, however additional time was spent re-surveying the areas concerned, and an appropriate period of camera trapping was later completed successfully in both locations.

5 Results

5.1 Badger

5.1.1 Nether Lochaber

There were no records of badger within the Nether Lochaber development site. However, records of the species were identified within 2km (NBN, 2024), thus, the species are known to be present locally. Nonetheless, no field signs indicative of badger were identified within the Nether Lochaber planning boundary or 100m buffer area. As such, the evidence suggests that no badger sett was anticipated at the time of survey, and it is considered unlikely that badger frequent the area. It is anticipated that this could be due to fragmentation, and the dampness of the substrates within appropriate habitat types (such as the wooded area towards the north), which could hinder upon sett building opportunities. Nonetheless, based on the data collected during the protected species survey, the potential for badger to utilise the area infrequently for commuting or foraging and the potential for a badger sett to be created at a later stage cannot be discounted.

5.1.2 Ardgour

No records of badger were identified within 2km of the Ardgour planning boundary. Furthermore, although potential commuting and foraging habitat for badger was identified within the Ardgour development site (i.e., areas of farmland and scrub), no field signs indicative of badger were identified. Therefore, the evidence suggests that no badger sett was anticipated at the time of survey, and it is considered unlikely that badger frequent the area. Nonetheless, based on the data collected during the protected species survey, the potential for badger to utilise the area infrequently for commuting or foraging and the potential for a badger sett to be created at a later stage cannot be discounted.

5.2 Pine Marten

5.2.1 Nether Lochaber

There were no records of pine marten within the Nether Lochaber planning boundary, however pine marten were previously recorded within 2km. In particular, there were records of two deceased pine marten on public highways, with one recorded on the A82, situated north of the Nether Lochaber survey area, and another recorded south-east of the site, on an unnamed road, off the A82 (NBN, 2024). In addition, a local resident informed the ecological surveyors that a pine marten previously denned within their residential outbuilding (see R35; Table 5.1). As such, pine marten were anticipated to be present locally.

Table 5.1: Potentially Important Ecological Features for Pine Marten Recorded in Nether Lochaber Planning boundary

Record No.	Location		Description	Photo(s)
	Easting	Northing		
R23	202283	763779	Small hollow beneath a rocky ledge. Dry and well sheltered by vegetation. Potential den site.	P1
R24	202284	763780	Small hole beneath risen tree root, running into a larger hollow beneath the tree. Potential den site.	P2
R26	202284	763783	Small hollow beneath roots of windblown tree. Ground appears slightly damp suggesting site may not be well sheltered. Potential den site.	P3
R34	202399	764027	Area of windblown Larch providing a deadwood matrix with suitability for denning.	P4 & P60
R35	202241	763654	Pine marten previously identified denning within residential outbuilding by landowner.	None taken due to private residential outbuilding.

No definitive evidence of pine marten was identified within the Nether Lochaber planning boundary or 250m buffer area the site surveys in 2023, although five features and one area containing several features with potential suitability for denning were identified within the broadleaved woodland, situated towards the north of the Nether Lochaber development site (Affric, 2024b). During the site surveys in 2024, two of the features were discounted, due to the observation of heavy waterlogging during rainfall, which provided evidence that they were unlikely to provide suitable shelter for pine marten (hence are not included within Table 5.1). Three features are the larger area containing several features were still considered to have potential suitability for pine marten denning (including R23, R24, R26 and R34) (see Table 5.1). These features were investigated further with the use of camera traps in summer 2024, as described in Section 4.3: Camera Trapping.

No pine marten were observed on the camera traps installed at features R23, R24 or R26 (shown as PMCT1, PMCT2, PMCT3, PMCT4 and PMCT5 on Drawing 99_DRG_23_2). As such, it was considered unlikely a pine marten den was present within these features at the time of survey.

R34 was a large area of windblown larch (*Larix decidua*), that could not be fully surveyed by the ecologist, due to safety constraints and inaccessibility (Table 5.1) (see Section 4.4: Limitations). As such five camera traps were placed amongst features that would typically be utilised by pine marten, such as fallen stems providing opportunities to commute at height and potential den features (shown as PMCT6, PMCT7, PMCT8, PMCT9 and PMCT10 on Drawing 99_DRG_23_2). One pine marten was caught on the camera trap on one occasion, during the evening of the 2nd September 2024 (see photo P60 in Appendix 1: Photographs). The pine marten was observed running along the stem of a fallen larch tree. The footage of the pine marten was fleeting, and no behaviours generally associated with foraging or denning were observed. As such, it was considered unlikely that the pine marten was a frequent visitor of the

area, and thus, the potential for a den to be present at the time of survey was considered unlikely. Nonetheless, the potential for pine marten to build dens within the Nether Lochaber development site in the future cannot be discounted, as the species are territorial, and younger individuals might seek out new opportunities. Thus, the potential for pine marten to be present within the Nether Lochaber development site in the future cannot be discounted.

Habitats identified within the area of the Nether Lochaber construction compound site are generally considered to be unsuitable for pine marten. Hence, although it is possible that pine marten could commute through the site, denning and/or foraging is considered unlikely.

5.2.2 Ardgour

No data records of pine marten were identified within the Ardgour planning boundary, however data records were identified within 2km (NBN, 2024). The habitats within the Ardgour development site and 250m buffer area were considered to be largely suboptimal for pine marten, due to their residential and agricultural nature. However, when resources are available, pine marten do utilise agricultural and residential areas as part of a greater habitat matrix. Hence, the potential for pine marten to utilise habitats within the Ardgour development site on an infrequent basis cannot be discounted.

5.3 Red Squirrel

5.3.1 Nether Lochaber

No records of red squirrel were recorded within the Nether Lochaber planning boundary, however there were records of the species within close proximity to the area. In particular within the coniferous forestry plantation situated on the eastern side of the A82 and within the woodlands around Inchree (NBN, 2024).

The area of woodland within the Nether Lochaber development site (including sections of broadleaved, conifer and mixed trees) was considered to provide potential suitability for red squirrel, however no field signs indicative of the species were identified during the site survey. Therefore, it was considered unlikely that a red squirrel drey was present at the time of survey. However, based on the data collected during the protected species survey, the potential for red squirrel to utilise the area infrequently for commuting or foraging and the potential for a red squirrel drey to be created at a later stage cannot be discounted.

Habitats identified within the area of the Nether Lochaber construction compound site are generally considered to be unsuitable for red squirrel. Therefore, their presence within the Nether Lochaber construction compound is considered to be unlikely, although cannot be entirely discounted.

5.3.2 Ardgour

No records of red squirrel were identified within the Ardgour planning boundary. However, records of red squirrel were identified within 2km. In particular, the species was recorded within a residential garden off the A861 situated immediately adjacent to the Ardgour development site. Nonetheless, habitats within the Ardgour planning boundary were considered to be suboptimal for red squirrel, due to the residential and agricultural nature. Hence, although the potential for a red squirrel drey to be constructed in the future cannot be fully discounted, their presence within close proximity to the Ardgour planning boundary is considered unlikely.

and it is considered unlikely that a red squirrel drey would be present within close proximity to the Ardgour planning boundary.

5.4 Otter

5.4.1 Nether Lochaber

Throughout the Nether Lochaber development site and surrounding 200m buffer area, field signs indicative of otter were identified in and around the shoreline, suggesting that otter were actively present within the area. A summary of the field signs recorded during the survey is provided in Table 5.2. The location of these field signs is shown in Drawing 99_DRG_21_2. The habitats within the Nether Lochaber development site provided ample opportunities within the rock and grassy slopes for places of shelter and laying-up, particularly to the northern edge of the Nether Lochaber development site, where natural rock formations meet the shoreline and there is less disturbance.

Table 5.2: Field Signs Indicative of Otter Recorded in the Nether Lochaber Planning boundary

Field Record No.	Location		Description	Photo(s)
	Easting	Northing		
R1	202186	763621	Two old spraints located immediately adjacent to each other, adjacent to entrance to R2 potential otter holt.	P5
R2	202192	763617	Potential otter holt in rock/boulder formation at rear of gardens, on shoreline.	P6 – P7
R3	202252	763753	New spraint.	P8
R4	202256	763754	Potential lay-up and track in on edge of woodland.	P9 – P10
R5	202316	763937	Potential lay-up on flat grassy area, track in, old spraint, and feeding remains in immediate vicinity.	P11 & P26 – P27
R6	202318	763940	New spraint.	P12
R7	202364	764120	Remains of several old spraints on rocky outcrop.	P13
R37	202189	763623	Spraint.	P35
R38	202180	763628	Feeding remains (broken crab shell).	P36
R39	202175	763631	Spraint.	P37
R40	202184	763625	Potential lay-up.	P38
R57	202403	764144	Potential lay-up in wooded area.	P39

On the Nether Lochaber shoreline, two old spraints (R1) were located near one of the entrances to a potential holt (R2) (Table 5.2 and Drawing 99_DRG_21_2). This presented as a large rocky complex with numerous chambers to the rear, located towards the rear of the unmarked road between the ferry terminal and North Corran Beag residential property. Although there was no evidence of current use, the side and top of the rock formation was covered in fresh grass clippings, which may have covered any recent field signs.

Camera trapping was carried out at R2 during 2023 (show as OCT5 on Drawing 99_DRG_23_2); however, the camera trap was stolen. As such, no camera trap footage was obtained from the first installation. A second installation was undertaken later in 2024 (OCT6), however no footage of otter was recorded.

Further north, close to the edge of woodland adjacent to the shore was a potential lay-up and track in through grass (R4). A spraint was located a few metres away on a prominent grassy knoll (R3) (Table 5.2 and Drawing 99_DRG_21_2). These two features were located away from the residential dwellings and isolated in their locations from habitation or public access. R4 was surveyed with use of a camera trap during the late summer of 2023 (shown as OCT3 on Drawing 99_DRG_23_2), however no evidence of usage by otter was recorded.

R5 was noted as a potential lay-up in an area of flat grassland, adjacent to an old spraint and feeding remains on a nearby rocky ledge. A fresh spraint (R6) was located within the same grassy area within a few metres of the potential lay-up, indicating recent use of the area by otter (Table 5.2 and Drawing 99_DRG_21_2).

Camera trapping was carried out within the location of R5 in the late summer of 2023 (shown as OCT4 on Drawing 99_DRG_23_2). On 21st August 2023, otter were captured on two occasions, including one recording of an adult female and one cub, and another recording of an adult female and two cubs. On the 2nd, 3rd and 5th September 2023, a single male otter was recorded passing and sprainting at R5. Therefore, it was confirmed that the layup was in use by otter at this time. For further details on the camera trap footage recorded, please see Appendix 2: Camera Trap Footage.

At the northern extent of the 200m buffer around the Nether Lochaber development site, remains of a number of old spraints were located on a rocky outcrop, in an isolated location near to a transmission tower on the shoreline (R7) (Table 5.2 and Drawing 99_DRG_21_2).

Further evidence of otter was identified during the camera trap installation in 2024. This included two spraints (R37 and R39), feeding remains (R38) and a potential layup (R40), all situated near to Nether Lochaber House, adjacent to R1 and R2 (see Table 5.2 and Drawing 99_DRG_21_2). In addition, a potential layup was identified in the woodland area to the north of this location (R57) (Table 5.2 and Drawing 99_DRG_21_2).

Camera trapping was carried out at (R40) identified as (OCT 6 on Drawing 99_DRG_23_2) in the late summer of 2024 and no evidence of otter utilising the potential lay-up was gleaned.

An assessment of the Nether Lochaber construction compound site and surrounding habitats determined that the habitats within this area were largely suboptimal, due to their height above the nearby coastline and due to the lack of suitable resources and watercourses. No field signs indicative of otter were identified in this location. Hence, it is considered unlikely that otter would be present in the area of the Nether Lochaber construction compound site.

5.4.2 Ardgour

A summary of otter field signs noted throughout the Ardgour planning boundary and surrounding 200m buffer during the survey is provided in Table 5.3. The location of these field signs is shown in Drawing 99_DRG_20_2. The man-made structures within 200m of the Ardgour planning boundary provided minimal opportunities for otter and are subject to high levels of anthropogenic disturbance.

Table 5.3: Field Records Indicative of Otter Recorded in Ardgour During the Site Survey

Field Record No.	Location		Description	Photo(s)
	Easting	Northing		
R8	201424	763910	Potential lay-up in square pipe located at the base of sea defence wall, and several old spraints within pipe.	P14
R9	201671	763645	Potential otter holt in circular pipe at base of sea wall. Fresh footprints in sand at the entrance to the pipe.	P15 – P21 & P28 – P33
R49	201418	763919	Spraint on rock.	No photo.

Within the Ardgour otter survey area, a potential lay-up (R8) was identified north of the ferry terminal, at the base of the sea wall in front of the residential properties on the A861 (Table 5.3 and Drawing 99_DRG_20_2). This was located in a square hole in the sea defence wall. The remains of several old spraints were located within this. Camera trapping was carried out during 2024 (OCT1 on Drawing 99_DRG_22_2) No evidence of otter utilising this potential lay-up was obtained and as it was located approximately 94m from the Ardgour planning boundary, it is anticipated that it will not be impacted by the CFIIS. Further evidence of otter was observed adjacent to this location, however it is thought it is a transient sprainting spot. (R49) see Table 5.3 and Drawing 99_DRG_20_2).

Behind the coastal habitat was a road, and a residential area. Behind the residences was a small lochan (Lochan na Luireach), located within the outer reaches of the survey buffer area. As no otter tracks were found into or out of the lochan or between the lochan and coastal habitat, it was assumed that otter were not traversing between the shoreline and Lochan na Luireach.

To the south of the ferry terminal, a potential holt was identified in a circular culvert at the base of the sea defence wall (R9) (see Table 5.3 and Drawing 99_DRG_20_2). The bottom of the pipe was lined with sand, and fresh otter prints were noted at the entrance heading both into and out of the pipe. The pipe appeared to return inland under the sea defence and road above for a number of metres. No outlet was recorded on the road above (currently the ferry marshalling lane), or behind the sea defence.

Camera trapping was carried out within the location of R9 in the late summer of 2023 (shown as OCT2 on Drawing 99_DRG_22_2). Unfortunately, the camera situated at R9 was stolen, and therefore no footage was obtained in 2023.

A further attempt at camera trapping was carried out at R9 in the summer of 2024 and evidence of frequent usage by otter was identified. Footage of otter was captured almost every night between 15th and 27th July 2024, with the greatest abundance of otter recorded on 19th July 2024, where an adult female and three otter cubs (that were expected to be >1 year old) were recorded. The footage appeared to show otter entering and exiting the culvert, and therefore is considered to provide evidence that the culvert at R9 was an active otter holt at the time of survey. For further details on the camera trap footage recorded, please see Appendix 2: Camera Trap Footage. No otter were identified from the camera trap situated at OCT1/R8.

From this point southwards, there was no evidence of otter using the beach or areas of shrubland around Corran Point, or to the south of Corran Point Lighthouse. This was not deemed premium otter habitat and was, by its nature, more exposed to disturbance from the A861 road. The beach and grassland areas appeared well used by dog walkers and grazed by sheep. These areas may be utilised on a transitory basis by otter on route to less disturbed areas to the south, hence there is considered to be potential for otter to commute between habitats within the proximity of the Ardgour construction compound site, although the species is unlikely to enter the compound area, due to its agricultural nature and lack of suitable habitats and resources.

5.5 Other Species

As noted in Section 4: Methodology, if evidence of other protected species (i.e., not the target species) was identified during the site survey, it was recorded and mapped to ensure that all ecological receptors of the CFIIS were fully understood. These records are summarised in Table 5.4.

Table 5.4: Evidence of Protected Species (i.e. Excluding the Target Species) Recorded During the Site Surveys

Field Record No.	Location		Description	Photo(s)
	Easting	Northing		
R30	202380	763956	Areas of woodland carpeted by bluebell.	P22 – P23
R31	202345	764007	Former 'black house' creates potential hibernacula for amphibians and reptiles.	P24
R32	202366	763917	Pile of stones overgrown with moss and vegetation creates potential hibernacula for amphibians and reptiles.	P25

An area within the broadleaved woodland situated towards the north of the Nether Lochaber development site was carpeted by patches of bluebell (*Hyacinthoides* spp.) (R30) (see Table 5.4 and Drawing 99_DRG_21_2). The patches appeared to be dominated by native bluebell (*Hyacinthoides non-scripta*), however some Spanish bluebell (*Hyacinthoides hispanica*) and bluebell hybrids (*Hyacinthoides* × *massartiana*) were identified.

Two potential hibernacula sites for amphibians and reptiles were also identified within the broadleaved woodland towards the north of the Nether Lochaber development site (R31 and R32 (see Table 5.4 and Drawing 99_DRG_21_2). One of the potential hibernacula sites comprised of a pile of rocks and stones covered in moss and vegetation (R32), whilst the other was comprised of the remains of a former 'black house' (R31).

Native bluebell, herptiles and birds are all protected under the WCA (see Appendix 3: Relevant Legislation).

In addition, small mammal and ornithological species were captured on the camera trap footage during the three week survey period, including bank vole (*Myodes glareolus*), shrew (*Sorex araneus*), stoat (*Mustela erminea*), wood mouse (*Apodemus sylvaticus*), blackbird (*Turdus merula*), coal tit (*Periparus ater*), grey heron (*Ardea cinerea*), mallard (*Anas platyrhynchos*), robin

(*Erithacus rubecula*), starling (*Sturnus vulgaris*), thrush (*Turdus philomelos*) and wren (*Troglodytes troglodytes*).

6 Recommendations

6.1 Badger

No field signs indicative of badger were identified during the site survey, however the potential for the species to be present within the Nether Lochaber and/or Ardgour planning boundary at a later date cannot be discounted. Therefore, appropriate surveys for the species will be required prior to the commencement of any development works on-site. It is recommended that the survey requirements be incorporated into a badger SPP, to include all areas within 100m of both the Nether Lochaber and Ardgour planning boundaries.

6.2 Pine Marten

No pine marten dens were identified within either the Nether Lochaber or Ardgour planning boundaries, however the species were determined to pass through the Nether Lochaber development site on an infrequent basis (identified via camera trapping). Furthermore, the potential for pine marten to be present within the Nether Lochaber construction compound site and/or Ardgour planning boundary at a later date cannot be discounted. Therefore, appropriate surveys for the species will be required prior to the commencement of any development works on-site. It is recommended that the survey requirements be incorporated into a pine marten SPP, to include all areas within 250m of both the Nether Lochaber and Ardgour planning boundaries.

6.3 Red Squirrel

No field signs indicative of red squirrel were identified during the site survey, however the potential for the species to be present within the Nether Lochaber development site and/or Ardgour planning boundary at a later date cannot be discounted. Therefore, appropriate surveys for the species will be required prior to the commencement of any development works on-site. It is recommended that the survey requirements be incorporated into a red squirrel SPP, to include all areas within 50m of both the Nether Lochaber and Ardgour planning boundaries.

6.4 Otter

An active otter holt was identified within the Ardgour development site. A mother and three cubs were recorded utilising the feature on the camera trap footage however the feature is not considered a natal holt as cubs appeared to be approximately a year old and the holt is located in an area of high disturbance. Female otters often give birth away from areas of high disturbance and keep their cubs in the natal holt for the first few months subsequently moving them to a holt closer to the water (NIEA, 2011). Due to its usage by an EPS, this holt is protected under the Habitats Regulations (see Appendix 3: Relevant Legislation for further details). It should be noted however that the holt is located outwith 30m of the works and there are therefore no licensing requirements.

As otter are highly mobile, active in the area and often seek out new opportunities and there is the potential for new features to occur. Appropriate surveys for the species prior to the commencement of construction will therefore be required. In the instance that there are any

active features that could be disturbed by the works, licences must be sought, as advised by an appropriately competent and experienced ecologist. It is recommended that the survey requirements be incorporated into an otter SPP, to include all areas within 200m of both the Nether Lochaber and Ardgour planning boundaries.

6.5 Other Protected Species

6.5.1 Native Bluebell

Where feasible, areas of native bluebell should be avoided. Where the built footprint conflicts with patches of native bluebell, opportunities for translocation should be discussed with an ecologist with appropriate experience and competency in botanical translocation works. Where non-native or hybrid bluebell are present, care should be taken to avoid accidental spread of non-native species. It is recommended that appropriate mitigation be implemented via a bluebell SPP.

6.5.2 Herptiles

Features with potential to act as hibernacula should be removed by hand under the supervision of an ecologist, outside of the herptile hibernation season (October to March inclusive). Furthermore, a mitigation plan to manage risk to herptiles during vegetation removal will be required. This should be incorporated into a herptile SPP.

6.5.3 Breeding Birds

Due to the density of the woodland and the elusivity of many bird species, it is unlikely that vegetation could be inspected to an extent for an ecologist to confirm that no birds' nests were present during the breeding bird season. Therefore, vegetation removal (including tree removals) should be undertaken outside of the breeding bird season (March to September inclusive). Furthermore, a pre-construction Breeding Bird Survey must be undertaken by a competent and experienced ecologist if works are scheduled to start within the breeding bird season. During the breeding bird season, ongoing checks for nesting birds undertaken by an appropriate competent and experienced ecologist will be required, with the implementation of appropriate mitigation where necessary. A breeding bird SPP will be required to cover all of the necessary mitigation measures.

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8 Glossary

Acronym	Definition
BAP	Biodiversity Action Plan
CFIIS	Corran Ferry Infrastructure Improvement Scheme
D	Disused
DEFRA	Department for Environment, Food and Rural Affairs
EIA	Environmental Impact Assessment
EPS	European Protected Species
HNBAP	Highland Nature Biodiversity Action Plan
INNS	Invasive Non-native Species
km	Kilometres
NBN	National Biodiversity Network
PEA	Preliminary Ecological Appraisal
PU	Partially-used
SPP	Species Protection Plan
THC	The Highland Council
UK	United Kingdom
WCA	Wildlife and Countryside Act 1981 (as amended)
WU	Well-used

Appendix 1: Photographs

Table A1.1: Photos Taken During the Protected Species Survey with Descriptions

Photo ID	Photo	Description
P1		R23 - small hollow beneath a rocky ledge. Dry and well sheltered by vegetation. Potential pine marten den site.
P2		R24 - small hole beneath risen tree root, running into a larger hollow beneath the tree. Potential pine marten den site.
P3		R26 - small hollow beneath roots of windblown tree. Ground appears slightly damp suggesting site may not be well sheltered. Potential pine marten den site.
P4		R34 - Area of windblown Larch providing a deadwood matrix with suitability for denning.

Photo ID	Photo	Description

[Redacted]

Photo ID	Photo	Description

[Redacted]

Photo ID	Photo	Description

[Redacted]

[Redacted]

Photo ID	Photo	Description

[Redacted]

Photo ID	Photo	Description

[Redacted]

Photo ID	Photo	Description

[Redacted]

Photo ID	Photo	Description
P22		R30 - native bluebell identified within the broadleaved woodland, towards the north of the Nether Lochaber survey area.
P23		R30 - native bluebell identified within the broadleaved woodland, towards the north of the Nether Lochaber survey area.
P24		R31 - Former 'black house' provides a suitable hibernacula for amphibians and reptiles.
P25		R32 - Pile of stones overgrown with moss and vegetation provides a suitable hibernacula for amphibians and reptiles.

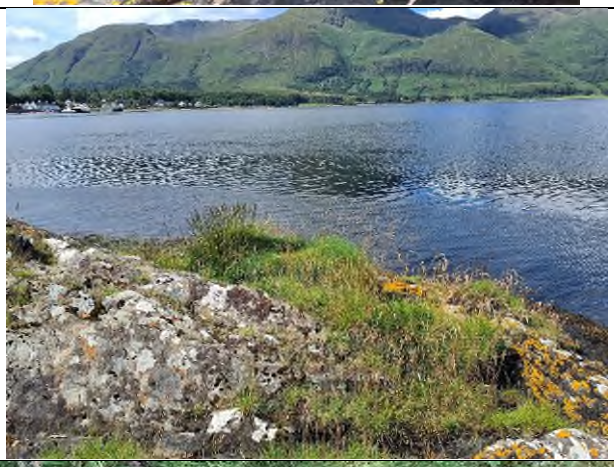
Photo ID	Photo	Description

[Redacted]

Photo ID	Photo	Description

[Redacted]

Photo ID	Photo	Description
P34		R34 – Pine marten caught on camera trap footage within the location of the windblown larch trees, recorded on the evening of the 2nd September 2024.
P35		R37 - Spraint.
P36		R38 - Feeding remains (broken crab shell).

Photo ID	Photo	Description
P37		R39 - Spraint.
P38		R40 - Potential lay-up.
P39		R57 – Potential lay-up (Wooded area).

Appendix 2: Camera Trap Footage

Observations of the target species recorded on the camera traps are provided in the tables below.

Table A2.1: Description of Footage of Pine marten at R34

Date	Time	Description	Photos
02/09/2024	22:54	1 pine marten passing, running along fallen tree stem	P34

** Note a selection of photos from the camera trap footage have been selected.*

Table A2.2: Description of Footage of Otter at R5

Date	Time	Description	Photos
21/08/2023	04:42	2 otter (1 female and 1 cub) passing.	P26
21/08/2023	04:43	3 otter (1 female and 2 cubs) passing;	-
02/09/2023	02:48	1 otter (1 male) passing.	-
03/29/2023	23:27	1 otter (1 male) sprainting.	-
05/09/2023	23:52	1 otter (1 male) sprainting.	P27

** Note a selection of photos from the camera trap footage have been selected.*

Table A2.3: Description of Footage of Otter at R9

Date	Time	Description	Photos
15/07/2024	23:57	1 otter left of shot very faint.	-
17/07/2024	00:46	1 otter (close to entrance to culvert).	P28
17/07/2024	00:47	1 otter (close to entrance to culvert).	-
18/07/2024	02:27	1 otter (close to entrance to culvert).	-
19/07/2024	01:28	1 otter (passing entrance to culvert).	-
19/07/2024	02:48	4 otters (adult female and 3 cubs, expected to be over a year old).	P29
21/07/2024	02:23	2 otters (both cubs, 1 exits culvert).	-
21/07/2024	02:24	3 otters (2 on beach, 1 near culvert entrance).	-
21/07/2024	02:25	1 otter leaving towards beach.	-
21/07/2024	03:48	1 larger otter inspecting the beach.	-

Date	Time	Description	Photos
21/07/2024	03:49	1 larger otter on beach, before returning to culvert	-
21/07/2024	23:08	1 otter entering culvert.	-
22/07/2024	01:15	1 otter coming towards entrance to culvert.	-
22/07/2024	02:16	1 otter at entrance to culvert .	-
22/07/2024	02:17	1 otter leaving towards beach.	-
22/07/2024	22:48	1 larger otter on the beach.	P30
24/07/2024	01:09	1 otter near entrance to culvert.	P31
24/07/2024	01:10	1 otter leaving towards beach.	-
24/07/2024	01:10	1 otter right of shot on beach.	-
24/07/2024	02:47	1 otter entering the culvert.	-
24/07/2024	02:47	1 otter outside culvert and leaving.	P32
24/07/2024	23:02	1 otter far distance on beach.	-
25/07/2024	01:30	1 otter on the beach leaving.	-
25/07/2024	03:13	1 otter entering the culvert.	-
26/07/2024	03:02	1 otter entering the culvert.	-
27/07/2024	00:13	1 otter rolling in the sand.	-
27/07/2024	00:13	1 otter on the beach.	-
27/07/2024	00:28	1 otter on the beach (different from previous).	-
27/07/2024	00:29	1 otter leaving the beach.	-
27/07/2024	00:29	1 otter entering the culvert.	P33
27/07/2024	02:43	1 young otter near culvert.	-
27/07/2024	03:00	1 otter on the beach.	-
27/07/2024	03:01	1 otter on the beach.	-

** Note a selection of photos from the camera trap footage have been selected.*

Appendix 3: Relevant Legislation

The legislation outlined within the sections below provides an overview of the relevant legislation to badger, pine marten, red squirrel and otter. In particular, The Protection of Badgers Act 1992 as amended by the Wildlife and Natural Environment (Scotland) Act 2022 (hereafter 'The Protection of Badgers Act'), the Wildlife and Countryside Act 1981 (as amended) (hereafter 'WCA') and the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (hereafter referred to as the 'Habitat Regulations').

Badger

Badger and their setts are protected under the Protection of Badgers Act. This makes it an offence to:

- Wilfully take, injure or kill a badger;
- Be cruel to a badger;
- Intentionally or recklessly interference with a badger sett;
- Sell or have possession of a badger; and
- Mark or ring a badger.

The Protection of Badgers Act defines a badger sett as "any structure or place which displays signs indicating current use by a badger". Interfering with a badger sett includes:

- Damaging or destroying a sett or any part of it;
- Obstructing access to a sett;
- Disturbing a badger while it is in a sett; and
- Causing or allowing a dog to enter a badger sett.

Pine marten

Pine marten receive full protection under Schedule 5 of the WCA. Furthermore, certain methods of killing or taking pine martens are illegal under the Habitat Regulations. Legislation makes it an offence to intentionally or recklessly:

- Kill, injure or take a pine marten;
- Damage, destroy or obstruct access to a nest or den; and
- Disturb a pine marten when it is occupying a nest or den for shelter or protection (except when this is inside a dwelling house).

Possess, sell and transport offences are ones of strict liability (i.e. they don't require intention or recklessness). It is an offence to:

- Possess or control, sell, offer for sale or possess or transport for the purpose of sale any living or dead pine marten or any derivative of such an animal.

In addition, it is an offence to knowingly cause or permit any of the above acts to be carried out.

Red squirrel

Red squirrels and their dreys receive full protection under Schedules 5 and 6 of the WCA. This legislation makes it an offence to intentionally or recklessly:

- Kill injure or take a red squirrel;
- Damage, destroy or obstruct access to a drey of any other structure or place which a red squirrel used for shelter or protection; and
- Disturb a red squirrel when it is occupying a structure or place for shelter or protection.

(This protection does not apply to areas in which red squirrel use to feed).

It is also an offence to:

- Possess or control, sell or offer for sale, or possess or transport for the purpose of sale any living or dead red squirrel or any derivative of such an animal; and
- Release a grey squirrel (*Sciurus carolinensis*) into the wild.

Furthermore, knowingly causing or permitting any of the above acts to be carried out is also an offence.

European Protected Species

Otter are a European Protected Species (EPS). Thus, receive full protection under the Habitat Regulations. This legislation makes it is an offence to deliberately or recklessly:

- Capture, injure or kill an otter;
- Harass an otter or group of otters;
- Disturb any structure an otter uses for shelter or protection or disturb an otter whilst in such a place;
- Disturb an otter while it is rearing or otherwise caring for its young;
- Obstruct access to any structure or place an otter uses for shelter or protection or otherwise deny otter use of such a place;
- Disturb an otter in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species; and
- Disturb an otter in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

It's also an offence to:

- Damage or destroy a breeding site or resting place of an otter (whether or not deliberately or recklessly);
- Keep, transport, sell or exchange, or offer for sale or exchange any wild otter (or any part or derivative of an otter) obtained after 10th June 1994.

Places that otter use for shelter or protection are protected whether the animal is present or not.

Protected Species Licensing

Protected species licences and EPS licences can be granted by NatureScot to allow for works that would usually be considered illegal to become legal. In order for licences to be granted, proposals must pass through several tests ensuring that there is no satisfactory alternative and that the risks are appropriately mitigated. Should a protected species or EPS licence be required, it is recommended that a competent and experienced ecologist be contacted in order to provide an appropriate assessment of the works.

Native Bluebell

All wild plant and fungi species review some protection under the WCA. However, some rare and vulnerable species (including native bluebell) are given additional protection under Schedule 8 of the WCA. A summary of offences and the relevant legislation is provided in the sections below.

It is an offence to:

- Intentionally or recklessly uproot any wild plant or fungi without the permission of the owner or occupier of the land it grows on.

Furthermore, as bluebell are listed in Schedule 8 of the WCA, it is an offence to:

- Intentionally or recklessly pick, uproot or destroy any wild plant or fungus (or its seeds or spores);
- Sell, offer for sale, possess or transport for the purpose of sale any living or dead plant or fungus; and
- Partial protection of a species under Schedule 8 generally prohibits anyone from selling or advertising for sale any plant or fungus. But it isn't an offence to pick such plants or fungi.

Herptiles

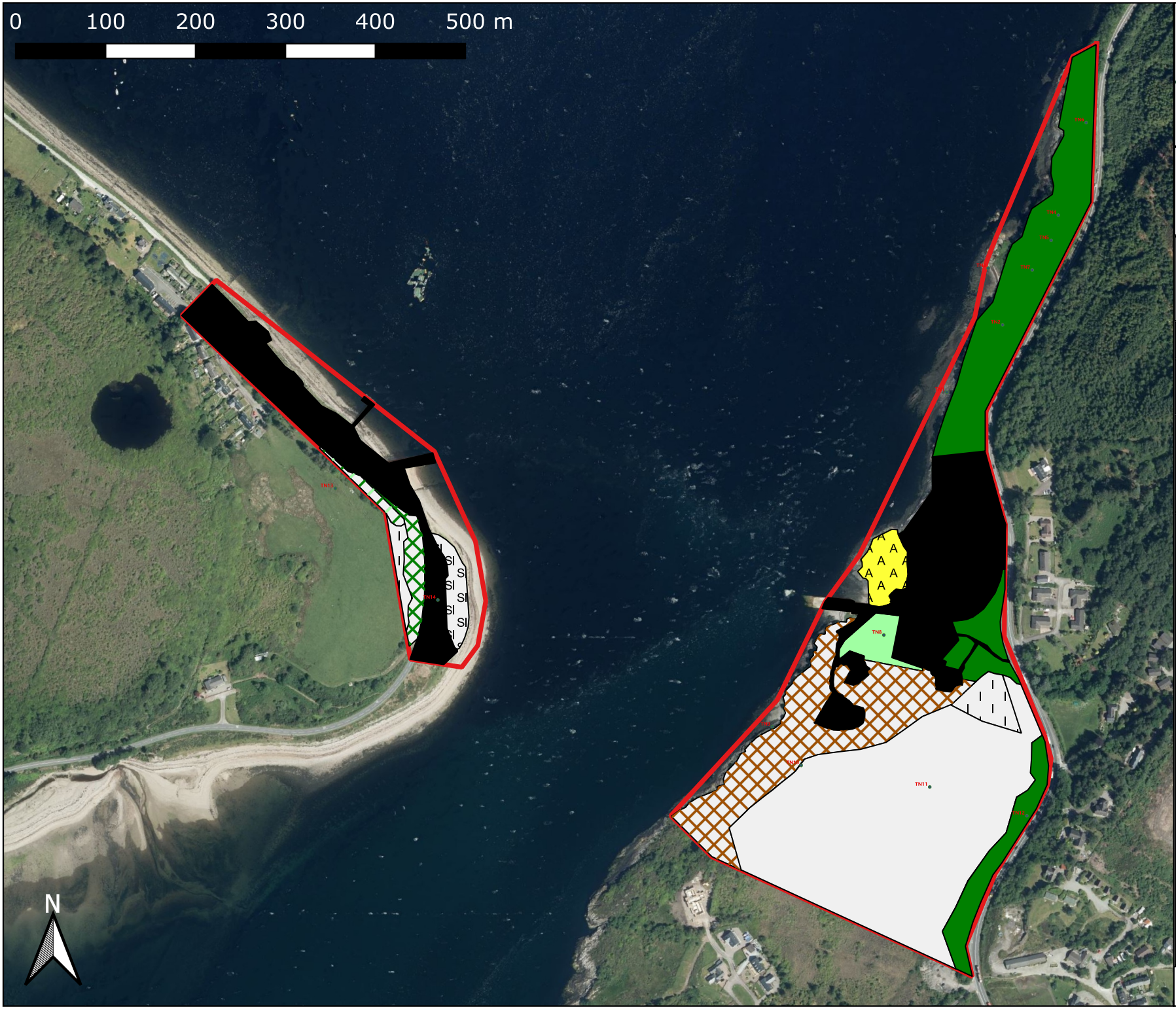
Herptiles are also protected under the WCA. Common lizard (*Zootoca vivipara*), slow worm (*Anguis fragilis*) and adder (*Vipera berus*) are protected against:

- Intentional or reckless killing and injury; and
- Trade – i.e. sale, barter, exchange, transport for sale, or advertise for sale or to buy.

Smooth newt (*Lissotriton vulgaris*), palmate newt (*Lissotriton helveticus*), common frog (*Rana temporaria*) and common toad (*Bufo bufo*) are protected against trade.

Additional protected is afforded to other herptile species within the UK, however it is considered unlikely that rare or vulnerable species would be present within the CFIIS site (Affric, 2022).

Drawings



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99_DRG_03_1: Site Habitat Map

Projection: OSGB 1936/British National Grid EPSG: 27700

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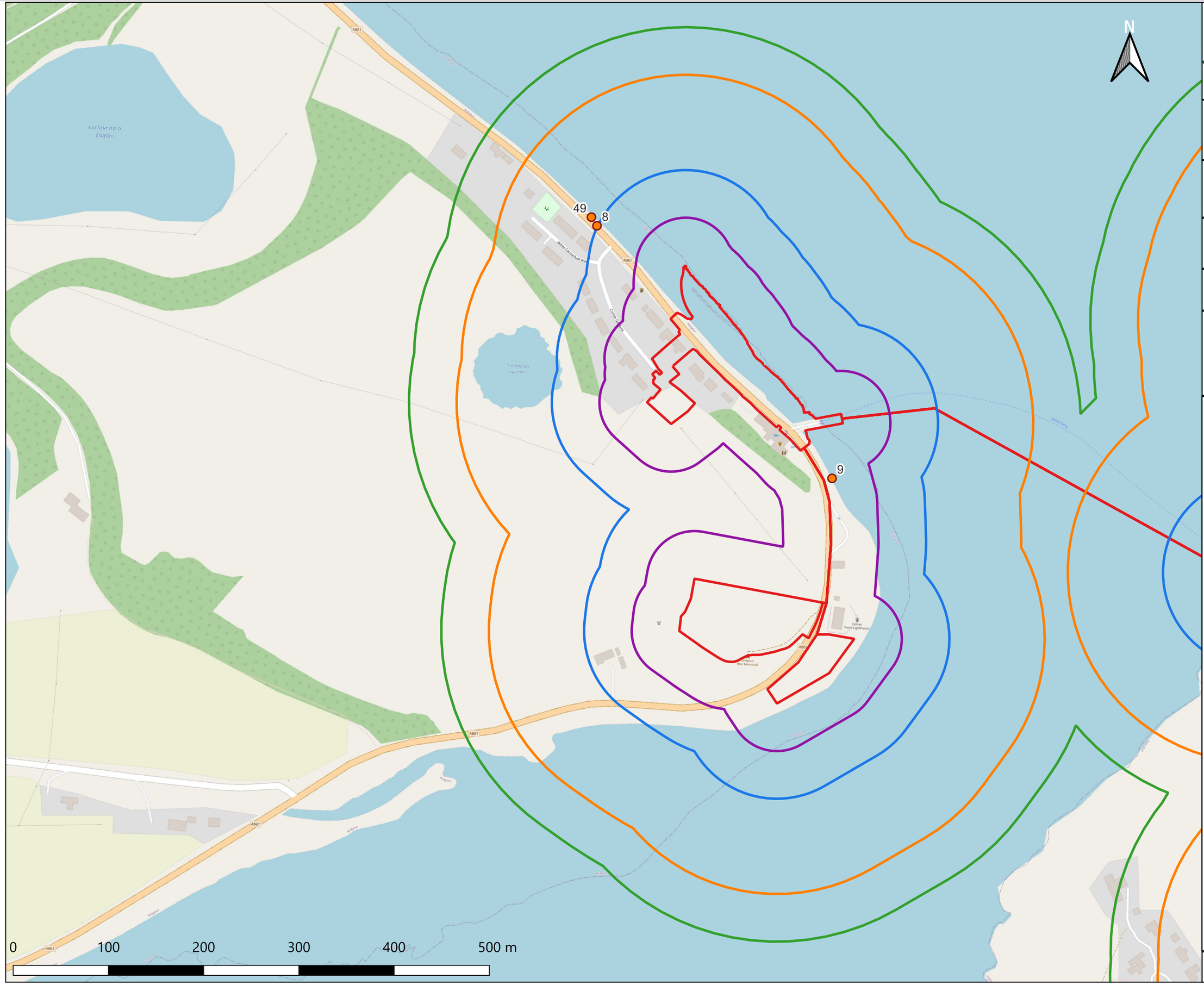
Legend

Habitats

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.2.1 - Coniferous woodland - semi-natural
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- B4 - Improved grassland
- B6 - Poor semi - improved grassland
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.4 - Introduced shrub
- J3.6 - Buildings
- J5 - Other habitat
- Target Notes PEA
- Survey Area



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Title: 99_DRG_20_2 Ardgour
Indicative Species Survey Areas

Projection: OSGB 1936/British National Grid EPSG: 27700

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Legend

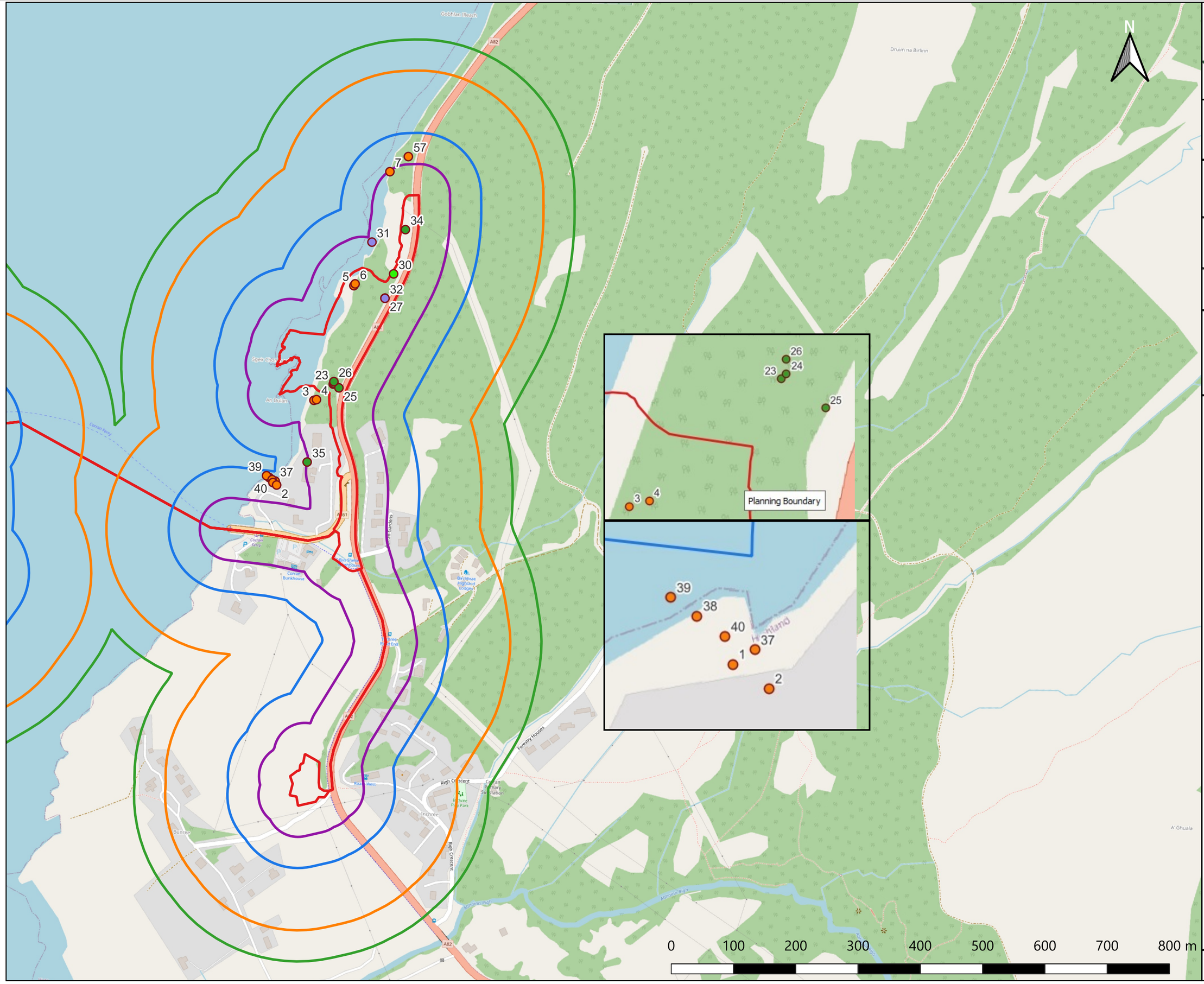
Planning Boundary

Buffers

- 50m Red Squirrel
- 100m Badger
- 200m Otter
- 250m Pine Marten

Corran_Ecological_Data

- Otter



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Title: 99_DRG_21_2 Nether Lochaber Indicative Species Survey Areas

Projection: OSGB 1936/British National Grid EPSG: 27700

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Legend

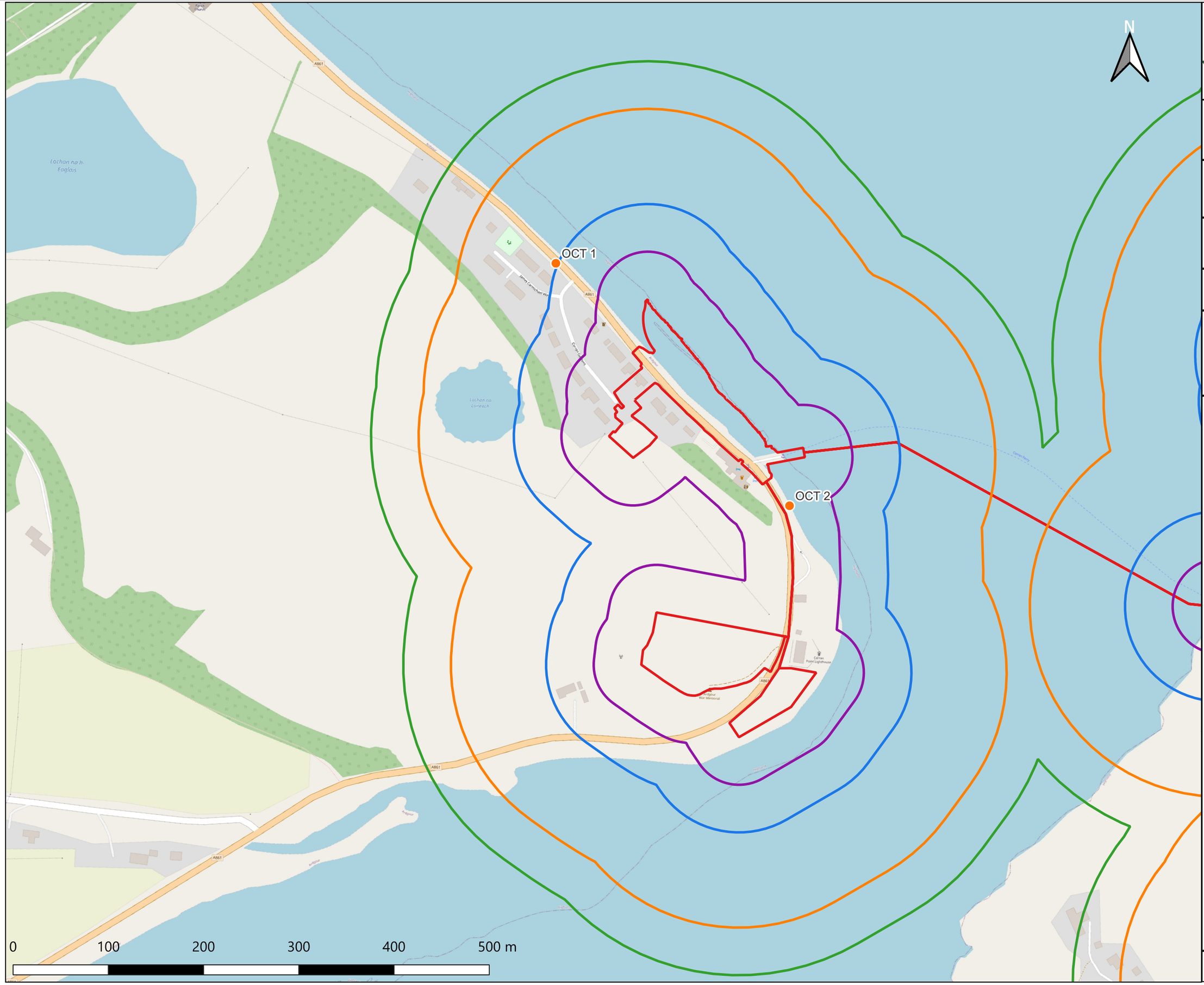
Planning Boundary

Buffers

- 50m Red Squirrel
- 100m Badger
- 200m Otter
- 250m Pine Marten

Corran_Ecological_Data

- Amphibian
- Otter
- Pine marten
- Protected plant species



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Title: 99_DRG_22_2 Ardgour Camera Trap Locations

Projection: OSGB 1936/British National Grid EPSG: 27700

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Legend

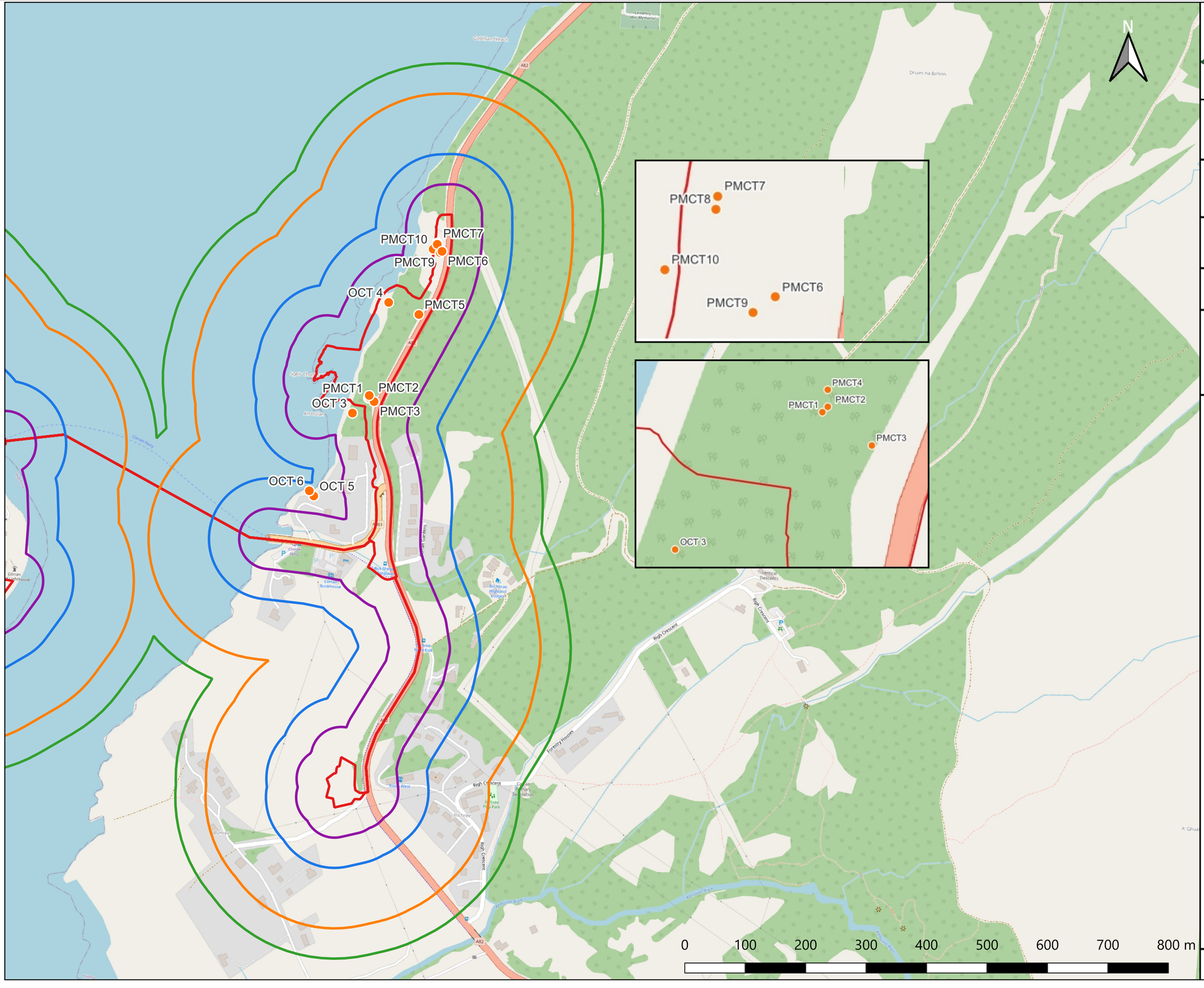
Planning Boundary

Buffers

- 50m Red Squirrel
- 100m Badger
- 200m Otter
- 250m Pine Marten

Ecological Survey Equipment

- Camera trap



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Title: 99_DRG_23_2 Nether Lochaber Camera Trap Locations

Projection: OSGB 1936/British National Grid EPSG: 27700

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Legend

Planning Boundary

Buffers

- 50m Red Squirrel
- 100m Badger
- 200m Otter
- 250m Pine Marten

Ecological Survey Equipment

- Camera trap

Corran Ferry Infrastructure Improvement Scheme

Appendix K.5: Habitat Survey and Baseline Condition Assessment

Wallace Stone
Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

Corran Ferry Infrastructure Improvement Scheme

Habitat Survey and Baseline Condition Assessment

Report No. 99_REP_17

Date: 18/02/2025

Document Control

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1 Introduction

The Highland Council (THC) are in the process of seeking planning permission and marine licences for the Corran Ferry Infrastructure Improvement Scheme (CFIIS). The proposed development will span both the Nether Lochaber side and Ardgour side of the Corran Narrows. It will consist of the construction of a new slipway, overnight berthing structure, the formalisation of parking and a new footpath at Ardgour. In addition, the CFIIS will include the construction of a new slipway, breakwater with alignment structure, marshalling area, parking, shared-use path and public facilities north of the Corran settlement on the Nether Lochaber side, to support the operation of a new electric vessel and improve the resilience of the service. The area of the Planning Boundary, including associated construction compounds, is approximately 5.48 hectares (ha). Terrestrial habitats within the Planning Boundary which have been considered within the Baseline Condition Assessment (BCA) include an area of 4.278 ha, excluding intertidal areas.

Policy 3 of the National Planning Framework 4 (NPF4) sets out requirements for biodiversity enhancement for new developments (Scottish Government, 2023). Requirements for biodiversity enhancement are further detailed within THC Highland-wide Local Development Plan (HwLDP) (THC, 2012) and THC Biodiversity Enhancement Planning Guidance (THC, 2024a). Therefore, Wallace Stone have commissioned Affric Limited (hereafter referred to as 'Affric') on behalf of THC, to complete a Habitat Survey and BCA of the proposed CFIIS site. The Habitat Survey and BCA aims to collect sufficient baseline data of the ecological value of the CFIIS site, in order to provide evidence to determine the requirements for biodiversity enhancement associated with the proposed development works and determine whether there are any irreplaceable habitats.

2 Policy and Guidance

2.1 National Planning Framework 4

NPF4 is the national spatial strategy for Scotland. It sets out the spatial principles, regional priorities, national developments and national planning policy. Policy 3: Biodiversity of NPF4 states that:

a) Development proposals will contribute to the enhancement of biodiversity, including where relevant, restoring degraded habitats and building and strengthening nature networks and the connections between them. Proposals should also integrate nature-based solutions, where possible.
b) Development proposals for national or major development, or for development that require an Environmental Impact Assessment (EIA) will only be supported where it can be demonstrated that the proposal will conserve, restore and enhance biodiversity, including nature networks so they are in a demonstrably better state than without intervention. This will include future management. To inform this, best practice assessment methods should be used. Proposals within these categories will demonstrate how they have met all of the following criteria:
    a. The proposal is based on an understanding of the existing characteristics of the site and its local, regional and national ecological context prior to development, including the presence of any irreplaceable habitats;

b. Wherever feasible, nature-based solutions have been integrated and made best use of;
c. An assessment of potential negative effects which should be fully mitigated in line with the mitigation hierarchy prior to identifying enhancements;
d. Significant biodiversity enhancements are provided, in addition to any proposed mitigation. This should include nature networks, linking to and strengthening habitat connectivity within and beyond the development, secured within a reasonable timescale and with reasonable certainty. Management arrangements for their long-term retention and monitoring should be included, wherever appropriate; and
e. Local community benefits of the biodiversity and/or nature networks have been considered.

c) Any potential adverse impacts, including cumulative impacts, of development proposals on biodiversity, nature networks and the natural environment will be minimised through careful planning and design. This will take into account the need to reverse biodiversity loss, safeguard the ecosystem services that the natural environment provides, and build resilience by enhancing nature networks and maximising the potential for restoration (Scottish Government, 2023).

As a major development, which is subject to an EIA, the CFIIS will be expected to cover all three aspects of Policy 3 of NPF4.

2.2 Highland-wide Local Development Plan

THC HwLDP is THC's vision for the whole Highland Council area (excluding the area covered by the Cairngorms National Park) and sets out how land can be used by developers. Policies outlined within the HwLDP relevant to biodiversity enhancement are considered below.

- **Policy 51: Trees and Development**: THC will support development which promotes significant protection to existing hedges, trees and woodlands on and around development sites. The acceptable developable area of a site should be influenced by potential impacts to trees, and adequate separation distances will be required between established trees and any new development. THC will secure additional tree/hedge planting within a tree planting or landscape plan to compensate removal and to enhance the setting of any new development (THC, 2012).

The implementation of Biodiversity Enhancement for the CFIIS will ensure the protection of trees and additional tree/hedge planting, hence alignment to this policy.

- **Policy 60: Other Important Habitats and Article 10 Features:** THC will seek to safeguard the integrity of features of the landscape which are of major importance because of their linear and continuous structure or combination as habitat 'stepping stones' for the movement of wild fauna and flora (Noted as Article 10 features of The Habitats Directive 1992). THC will also seek to create new habitats which are supportive of this concept. THC will have regard to the value of other important habitats, which may not be protected by nature conservation site designations, in the assessment of any development proposals which may affect them either individually and/or cumulatively. THC will use conditions and agreements to ensure that significant harm to the ecological function and integrity of Article 10 Features and other important habitats is avoided. Where it is judged that the reasons in favour of a development

clearly outweigh the desirability of retaining those important habitats, THC will seek to put in place satisfactory mitigation measures, including where appropriate, consideration of compensatory habitat creation (THC, 2012).

The implementation of Biodiversity Enhancement for the CFIIS will align with the requirements of Policy 60: Other Important Habitats and Article 10 Features through ensuring the value of linear and 'stepping stone' habitat features is assessed and protected where possible.

- **Policy 74: Green Networks**: Green networks should be protected and enhanced. Development in areas identified for the creation of green networks should seek to avoid the fragmentation of the network and take steps to improve its connectivity, where this is appropriate. The detailed identification of green networks around regional and sub regional centres (as outlined within the HwLDP), will be carried out by THC using the methodology described in THC 'Green Networks: Supplementary Guidance' (THC, 2012; THC, 2013). Pending identification by THC of green networks, both within the study areas and elsewhere, developers should identify, protect and enhance the existing network of green spaces and green corridors which link built-up areas to the surrounding countryside, using the methodology in the supplementary guidance. The main principles of the guidance are to:
    - Help promote greenspace linkages and to safeguard and enhance wildlife corridors in and around new and existing developments;
    - Set out a methodology for identifying the Highland Green Network;
    - Enable new development to take advantage of the outstanding landscape in the area while also preserving areas of significant landscape value; and
    - Set out mechanisms for delivery of projects to maintain and enhance the existing green network (THC, 2012).

Implementation of Biodiversity Enhancement for the CFIIS will minimise the fragmentation of existing green networks and impacts to wildlife corridors, and thus, consideration of nature networks within the wider landscape.

- **Policy 75: Open Space**: THC's long term aim for open space provision is for:
    - The creation of sustainable networks of open space of high quality;
    - Areas of local open space that are accessible by foot and linked to a wider network;
    - Fit for purpose greenspaces and sports facilities that support and enhance biodiversity; and
    - Open spaces that improve the quality of life of residents and visitors.

  Existing areas of high quality, accessible and fit for purpose open space will be safeguarded from inappropriate development and enhancement will be sought, where appropriate. All sites identified by THC will be safeguarded unless:

    - It can be suitably demonstrated that the open space is not fit for purpose;
    - Substitute provision will be provided meeting the needs of the local area; or
    - Development of the open space would significantly contribute to the spatial strategy for the area (THC, 2012).

Biodiversity Enhancement for the CFIIS will align to Policy 75: Open Spaces by protecting green spaces where possible, and ensuring that existing green spaces support and enhance biodiversity.

2.3 NatureScot Biodiversity Metric Consultation

In the spring of 2024, NatureScot sought consultation on the development of a Scottish biodiversity metric in support of Policy 3: Biodiversity of NPF4 (NatureScot, 2024a; Scottish Government, 2024). Within the consultation, NatureScot advised that the absence of a universally adopted Scottish methodology / tool should not be used to frustrate or delay decision making, and a flexible approach will be required. NatureScot recommended that wherever relevant and applicable, information and evidence gathered for statutory and other assessment obligations, such as EIA, can be utilised to demonstrate those ways in which the policy tests set out in NPF4 have been met, and that where a developer wishes to use an established metric or tool, the planning submission should demonstrate how Scotland's habitats and environmental conditions have been taken into account. Where an established metric or tool has been modified, the changes made and the reasons for this should be clearly set out (NatureScot, 2024a). The extent of biodiversity enhancement that would be required was not detailed within the consultation, and therefore, it was expected that this would be outlined by the local planning authority (in this case THC).

2.4 The Highland Council Biodiversity Enhancement Planning Guidance

THC's Biodiversity Enhancement Planning Guidance was published in May 2024. The guidance aims to provide developers with an understanding of the level of biodiversity enhancement that will be required by THC, and a system in which biodiversity enhancement should be demonstrated.

THC recommends that England's Statutory Biodiversity Metric is used to demonstrate and to justify the type and extent of biodiversity enhancement proposed, until a Scottish biodiversity metric becomes available. Although it is noted that developers may wish to use an alternative metric, adapt or amend England's Statutory Biodiversity Metric or utilise a different methodology until a Scottish biodiversity metric becomes available. Where these, or other alternative approaches have been taken, the rationale must be clearly justified and set out in a supporting statement. Where habitat enhancement measures cannot be accurately taken into account through a metric, such as Invasive Non-native Species (INNS) removal, this will be considered by the THC as contributing towards enhancement (THC, 2024a).

THC also state within the guidance that a minimum of 10% biodiversity enhancement is required for major, national and EIA-scale developments (although a higher percentage and/or bespoke measures may be expected where development impacts a non-statutory designated area, or a locally important area as designated by THC) (THC, 2024a). As a major development, which is subject to an EIA, it is expected that a minimum of 10% biodiversity enhancement will be required for the CFIIS in order to be acceptable to THC.

2.5 The Highland Council Highland Nature Biodiversity Action Plan

THC's 'Highland Nature Biodiversity Action Plan 2021 – 2026', focuses on where positive biodiversity action can be taken to conserve and enhance important habitats and species. This includes the identification of species and habitats which can be supported locally, taking a lead from international and national priorities. THC's biodiversity action plan is considered to be

suitable to identify opportunities for biodiversity enhancement within the local area, which will actively support ongoing works to improve biodiversity within the wider locality. In addition, THC's biodiversity action plan is considered appropriate to determine whether specific habitat types are considered to be part of local strategy, in place of a Local Nature Recovery Strategy, which would generally be available from the local authority when considering biodiversity enhancement in England.

2.6 The Highland Council Ecology Strategy and Action Plan

THC's Ecology Strategy and Action Plan (THC, 2024b) sets out a commitment to tackling the ecological emergency of the Highlands, and a strategy to manage the Council estate more effectively for biodiversity. Within the Action Plan, a series of goals highlight key areas of action relating to biodiversity. These are:

- Goal 1: Leadership;
- Goal 2: Making Space for Nature;
- Goal 3: Planning;
- Goal 4: Pollution and Chemical Use;
- Goal 5: Communication, Training and Education; and
- Goal 6: Data Management.

The Biodiversity Enhancement elements of the CFIIS will align with, and implement Goals 1 to 3 through leading by example, embedding biodiversity enhancement within the project and ensuring that specific Biodiversity Enhancement requirements are met. Goal 4 will be met through Construction Environmental Management procedures during the Construction Phase of the project.

3 Methodology

3.1 Approach to Biodiversity Enhancement

Biodiversity enhancement is an approach to development that aims to leave the natural environment in a measurably better state than it was beforehand. At present, biodiversity metrics are generally considered to be the most appropriate tool to make a quantifiable assessment of biodiversity enhancement (NatureScot, 2024a; THC, 2024a). A quantifiable assessment allows the local authority to determine whether appropriate biodiversity enhancement, in proportion to the nature and scale of the proposed development, can be achieved. As such, England's Statutory Biodiversity Metric Tools have been utilised, as advised by THC and NatureScot (NatureScot, 2024a; THC, 2024a). In particular, the 'Statutory Biodiversity Metric Auditing and Accounting for Biodiversity Calculation Tool' and 'The Statutory Biodiversity Metric – Technical Annex 1: Condition Assessment Sheets and Methodology' (UK Government, 2024a), used in line with 'The Statutory Biodiversity Metric User Guide' (Department for Environment, Food and Rural Affairs (DEFRA), 2024).

Recommendations based on the findings of the Habitat Survey and BCA follow the 'Mitigation Hierarchy' approach. The Mitigation Hierarchy is a sequential process which has been developed to avoid, minimise and compensate for negative ecological impacts and effects (see Figure 3.1.1). As a first step, every effort is made to avoid and then minimise impacts on biodiversity. Habitat loss and/or degradation is only considered as a last resort and should be compensated with appropriate habitat enhancement and/or creation. Ideally habitat

enhancement and/or creation will be completed onsite, however, if this is not feasible, it is expected that off-site compensation will be required.

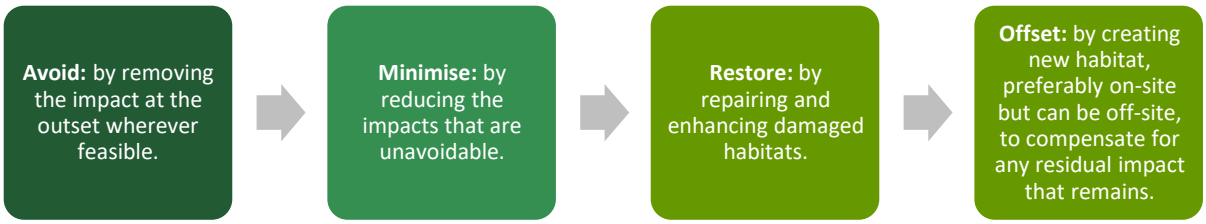

Figure 3.1.1: The Mitigation Hierarchy Approach (as Described within NatureScot's Developing with Nature Guidance (NatureScot, 2024b)

Irreplaceable habitats are considered to be technically very difficult to recreate once destroyed (or it is expected that recreation would take a significant amount of time). As such, requirements for biodiversity enhancement for irreplaceable habitats cannot be calculated by England's Statutory Biodiversity Metric. Impacts to on-site and off-site irreplaceable habitats should be avoided, unless an agreement can be achieved between the developer and the local authority, based on exceptional circumstances. The following habitats are considered to be irreplaceable:

- Ancient woodland;
- Ancient and veteran trees;
- Blanket bog;
- Limestone pavements;
- Coastal sand dunes;
- Spartina saltmarsh swards;
- Mediterranean saltmarsh scrub; and
- Lowland fens (UK Government, 2024b).

3.2 Terrestrial Habitat Survey and Baseline Condition Assessment

A Habitat Survey of all terrestrial habitats situated within the CFIIS site was conducted on the 3rd and 4th October 2024 by competent and experienced ecologists from Affric. Habitats were categorised using the United Kingdom (UK) Habitat Classification (UKHab) methodology to align with England's Statutory Biodiversity Metric (UKHab Limited, 2023) and were then further classified into the broader habitat classifications required for the BCA (UK Government, 2024b). The survey included the identification of species assemblages within the habitat parcel, with particular consideration of any species indicative of specific habitat types, however it was not considered to be a full botanical survey. The location of extent of each habitat parcel was drawn in the field with the use of QField, the mobile-optimised version of the Quantum Geographic Information System (QGIS). Furthermore, any data collected as part of the BCA was inputted for each habitat parcel when adding to the QField system.

The condition of each habitat parcel was assessed in the field using 'The Statutory Biodiversity Metric – Technical Annex 1: Condition Assessment Sheets and Methodology' (UK Government, 2024a). Each habitat parcel was assigned a reference number to ensure that the calculations could be carried through reliably to the biodiversity metric. The completed condition calculations are provided in Appendix 1: Condition Assessment Forms.

The extent and location of the habitats recorded during the Habitat Survey and BCA are shown in Drawings 99_DRG_30_1, 99_DRG_31_1, and 99_DRG_32_1. As the CFIIS site is spread over a large area, encompassing four separate land parcels, the drawings have been presented as three separate drawings for both the habitat survey and the baseline condition assessment. These represent the Ardgour Planning Boundary (which is comprised of the both the Ardgour development site and Ardgour construction compound site), the Nether Lochaber development site, and the Nether Lochaber construction compound site. The condition of the habitats recorded during the BCA are shown in Drawings 99_DRG_27_1, 99_DRG_28_1, and 99_DRG_29_1.

3.3 Watercourse Survey and River Condition Assessment

The River Condition Assessment (RCA) was undertaken for one watercourse feature within the CFIIS site, which will be subject to changes due to the CFIIS. The watercourse is located in the village of Nether Lochaber, within the Nether Lochaber development site, where it is expected that a small section of the watercourse will be culverted.

The RCA combined field and desk-based information to determine a condition score for each section of the watercourse feature, which ultimately feeds into the Watercourse Baseline of England's Statutory Biodiversity Metric.

In England, the Statutory Biodiversity Metric for watercourses should be completed by a Modular River Physical (MoRPh) accredited surveyor. However, an accreditation scheme is not yet available in Scotland. Field data was collected during a site survey on 22nd January 2025, using the MoRPh Pro and RCA training methodology (Gurnell *et al.*, 2019), in order to obtain the appropriate field data to complete the RCA. The survey was completed by an experienced and competent environmental consultant with specialism in watercourse management and restoration.

The site survey included an assessment of the linear watercourse feature and a 10m riparian zone on each bank, including any in-channel or riparian zone encroachment. The watercourse feature was split into sections according to watercourse type, condition and potential for future changes, due to the CFIIS. Each section of the watercourse and associated riparian zones were categorised into the mandatory fields of the Watercourse Unit Module of the biodiversity metric, including watercourse type, habitat distinctiveness, and habitat condition. The watercourse sections are shown in Drawing 99_DRG_31_1, and the RCA results are shown in Drawing 99_DRG_28_1.

3.4 Biodiversity Metric

The UK Government Statutory Biodiversity Metric was utilised to calculate area habitat unit values for CFIIS according to the methodology outlined below. The biodiversity metric currently contains the baseline information and can be requested as an MS Excel document (99_FOR_05_01). The biodiversity metric will be completed on finalisation of the biodiversity enhancement agreements.

In the biodiversity metric, the attributes of each habitat parcel, including the condition of each habitat parcel, (as determined by the outcomes of the BCA, see Section 3.2), were entered to determine the area habitat unit value.

The strategic significance of each habitat parcel was considered in line with 'The Statutory Biodiversity Metric User Guidance' (DEFRA, 2024), and also any specific habitat and locations refenced within the Highland Nature: Biodiversity Action Plan 2021-2026 (Highland Nature, 2021) and the HwLDP (THC, 2012). Where a habitat type was considered to be a part of relevant planning policy or conservation efforts, the habitat parcel was classified as 'formally identified in local strategy'. Habitat types not specifically listed within the local habitat initiatives but deemed to be ecologically important within the local area were classified as 'location ecologically desirable but not in local strategy' and all other habitats were classified as 'area/compensation not in local strategy/no local strategy'.

The area of different habitat parcels was calculated in hectares, whilst linear habitats were measures in kilometres (km), to align with the biodiversity metric. As the biodiversity metric does not allow area habitats of <0.01ha or linear habitats of <0.01km to be inputted, area habitats and linear habitats below these thresholds were excluded from the BCA.

Individual trees were recorded as target points on the map and their Diameter at Breast Height (DBH) was used to determine their size classification (either small, medium or large). The 'individual tree calculator' provided in the biodiversity metric was then utilised to calculate the area of habitat each tree provided. Trees with a DBH of less than 7.5 centimetres (cm) were discounted, as per metric guidance (UK Government, 2024a). It is assumed that areas associated with individual trees relate to the canopy structure oversailing the habitat areas below. As such, and in alignment with the metric guidance, the area of individual trees has not been deducted from the area habitats recorded underneath.

Sections of the watercourse were included within the biodiversity metric as lengths, calculated in km. The distinctiveness was pre-set by the biodiversity metric based on the watercourse type identified in the field. The condition of each watercourse section was assessed and inputted where applicable, based on the recognised guidance note for assessing river condition (Gurnell *et al*., 2020). The strategic significance of each habitat parcel was considered in line with 'The Statutory Biodiversity Metric User Guidance' (DEFRA, 2024), and the HwLDP (THC, 2012). The extent of watercourse encroachment was considered in line with the recognised guidance note for assessing river condition (Gurnell *et al*., 2020).

The Habitat Survey and BCA was completed for a large area and was used to identify ecological sensitivities that may need to be avoided. Hence, the biodiversity metric (Document Reference 99_FOR_05) does not include all of the habitat parcels outlined within this report, as only those situated within the Planning Boundary are listed within the biodiversity metric. The results shown in Section 7: Conclusion therefore utilise the data from the habitat parcels within the Planning Boundary. This is to ensure that the requirements for biodiversity enhancement, in proportion to the proposed development works, can be accurately determined.

4 Habitat Survey

4.1 Area Habitats

4.1.1 Nether Lochaber Development Site

Seven different habitat types were identified within the Nether Lochaber development site, as shown in Table 4.1.1. Detailed descriptions of each habitat parcel making up the Nether Lochaber development site are provided in the sections below (with the exception of areas associated with developed land with a sealed surface). The location of each habitat parcel within the Nether Lochaber development site is shown in Drawing 99_DRG_31_1. The condition of each habitat parcel is shown in Drawing 99_DRG_28_1.

Table 4.1.1: Habitats Present within the Nether Lochaber Development Site Survey Area

Habitat Type	Condition	Total Area (Ha)	Associated Habitat Parcels
Other Broadleaved Woodland	Poor	0.158	• 50
Other Broadleaved Woodland	Moderate	1.150	• 39 • 40 • 41 • 42 • 46
Other Woodland – Mixed	Poor	0.046	• 43
Other Coniferous Woodland	Poor	0.110	• 44
Mixed Scrub	Poor	0.0045	• 45
Modified Grassland	Poor	0.121	• 34 • 35 • 48
Bracken	N/A	0.094	• 47 • 49
Developed land – Sealed surface	N/A	0.539	• 33

4.1.1.1 Other Broadleaved Woodland

The north of the Nether Lochaber development site comprises a woodland strip running between the A82 and Loch Linnhe. The species composition of the woodland changed throughout the area, with specific locations showing evidence of a formerly managed coppice woodland. As such, the woodland was divided accordingly to ensure that areas of different species assemblages and/or condition were accurately captured, as shown in Drawing 99_DRG_31_1.

Habitat parcel 50 was a linear strip of broadleaved woodland situated along the edge of the access road for Corran Ferry, following the course of the Nether Lochaber watercourse located within the woodland (noted in Section 4.3: Watercourse Habitats). The habitat parcel is flanked by the A82 to the north, the A861 to the south and west, and a public footpath to the east. The woodland was not generally dominated by any one species, with a mix of hazel, silver birch, sycamore, larch (*Larix decidua*) and ash present. All trees appeared to be of relatively

similar age and there was no evidence of regeneration. The understorey was a dense mix of bramble, bracken and rhododendron. As a result of the presence of INNS and the lack of structural diversity and lack of deadwood and features of old growth, the woodland was considered to be of poor condition.

Habitat parcel 39 was a previously managed hazel (*Corylus avellana*) coppice woodland, which had since been left unmanaged, and was representative of a semi-natural broadleaved woodland. Other broadleaved species were also present within the canopy, including sycamore (*Acer pseudoplatanus*), rowan (*Sorbus aucuparia*), hawthorn (*Crataegus monogyna*), holly (*Ilex aquifolium*) and crack willow (*Salix fragilis*). In particular silver birch (*Betula pendula*) was abundant throughout. A small number of Sitka spruce (*Picea sitchensis*) were also recorded. The understorey was dominated by large patches of dense bramble (*Rubus fruticosus*) and rhododendron (*Rhododendron ponticum*), which made the woodland difficult to access. However, wood sorrel (*Oxalis acetosella*), bracken (*Pteridium aquilinum*) and sedge (*Carex* spp.) were identified from gaps in the woodland edge. A small number of Japanese knotweed (*Reynoutria japonica*) plants were identified at the south-western edge of the woodland. As a result of the lack of deadwood and features of old growth and the presence of INNS, the habitat was considered to be of moderate condition.

Habitat parcel 40 was comprised of a single-aged stand of alder (*Alnus glutinosa*), with a low abundance of other broadleaved species scattered around the woodland parcel, including sycamore, ash, silver birch and holly, which made up much of the understorey. The ground vegetation layer was comprised of a mix of bracken and sedges. Other species included common hogweed and ivy (*Hedera helix*). As a result of the lack of diversity in the age and structure of the woodland, the habitat was considered to be of moderate condition.

Habitat parcel 41 was another area of former hazel coppice, which has since been left unmanaged. Other broadleaved species were present in lower abundance, including sycamore, rowan, holly, silver birch and crack willow. In addition, a small number of Sitka spruce were identified. The understorey was dominated by various patches of bracken and rush (*Juncus* spp.), with a small amount of bramble present across the woodland floor. Within the woodland was the ruins of a 'black house' comprised of stones. Within the black house ruins were several tightly packed mature sycamore trees. The black house ruins were covered in a variety of moss species. Overall, the habitat did provide opportunities for wildlife, although due to previous management, the woodland was lacking in deadwood and features of old growth and therefore was considered to be of moderate condition.

The woodland within habitat parcel 42 was largely comprised of broadleaved species, including alder, rowan and silver birch. There was a low abundance of Sitka spruce, some of which had fallen and contributed towards the deadwood on the woodland floor. The understorey was dominated by bramble and rhododendron, although towards the centre of the habitat parcel was a large stand of Japanese knotweed. The Japanese knotweed appeared to have been recently treated with herbicide and there was evidence that the plants had responded to treatment. This area was excluded from the survey, due to management requirements for the INNS and exclusion tape around the affected area. Despite the presence of INNS, habitat parcel 42 was considered to be of moderate condition, as there was relatively good structural and species diversity and opportunities for wildlife, such as deadwood.

Habitat parcel 46, which was also an area of former hazel coppice, which did not appear to have been managed in some time. Coppiced hazel generally dominated the canopy, although rowan, ash (*Fraxinus excelsior*) and silver birch were also present. The understorey was comprised of gorse (*Ulex* spp.) and bramble. Other species present included bracken, foxglove (*Digitalis purpurea*) and common hogweed (*Heracleum sphondylium*). Seedlings and saplings were abundant on the woodland floor, providing evidence of natural regeneration within the habitat. Hence, despite the presence of INNS, the woodland was considered to be of moderate condition, as the transition from a managed hazel coppiced woodland was generating some structural and species diversity within the habitat.

1.1.1.1 Other Woodland – Mixed

Habitat parcel 43 was a mixed woodland, dominated with a mix of mature Sitka spruce and coppiced hazel. There is also a low abundance of silver birch. The understory was dominated by rhododendron, with wood sorrel recorded at the ground layer. There was considered to be a high abundance of deadwood in both the canopy and the woodland floor, however the trees appeared to have good vitality and there was no obvious sign of damage across the habitat parcel. Nonetheless, due to the lack of species diversity within both the canopy and ground level vegetation and the presence of INNS, the woodland was considered to be of poor condition.

4.1.1.2 Other Coniferous Woodland

Habitat parcel 44 was a coniferous woodland dominated by mature larch, which were likely to be formerly planted. A small number of broadleaved species were present, although accounted for <10% of the canopy. Scattered alder and holly were identified in low abundance, and there was a small number of coppiced hazel. The ground layer was dominated by bracken, with small infrequent patches of wood sorrel. Tree mortality appeared to be relatively good and there were no INNS present. However, the woodland was considered to be of poor condition, predominantly due to the presence of non-native conifers and the lack of species and structural diversity.

4.1.1.3 Mixed Scrub

Habitat parcel 45 consisted of mixed scrub. The species composition suggested that the area was formerly part of the woodland, which had since been removed resulting in dense scrub encroachment. It is expected that this is due to the underground pipeline which runs from the east and through Loch Linnhe. Tree species within the habitat parcel are largely scrub-like in appearance, in particular grey willow (*Salix cinerea*), with a low abundance of young alder and sycamore present. Bramble and gorse dominated the habitat parcel, whilst bracken and montbretia (*Montbretia crocosmia x crocosmiiflora*) (an INNS) were recorded within the ground vegetation. Due to the presence of invasive species and a lack of a well-developed edges or clearings and glades, habitat parcel 45 was determined to be in a poor condition.

4.1.1.4 Modified Grassland

Habitat parcel 34 was an area of mown grassland situated on the edge of the A82. Species identification was limited, due to damaged caused by mowing, however it was evident that there was a limited number of species present. Forb species were indicative of improvement, including common daisy (*Bellis perennis*), white clover (*Trifolium repens*) and broad-leaved dock (*Rumex obtusifolius*).

Habitat parcel 35 was an area of poor condition grassland situated on a rocky outcrop immediately adjacent to the woodland associated with habitat parcel 41. The habitat was largely a monoculture of grasses.

Habitat parcel 48 was dominated by grasses, in particular a mixture of perennial ryegrass (*Lolium perenne*), Yorkshire fog (*Holcus lanatus*), tufted hairgrass (*Deschampsia cespitosa*). In addition, six forb species were present including greater plantain (*Plantago major*), ragwort (*Senecio jacobaea*), white clover, broad-leaved dock, dandelion (*Taraxacum officinale*) and creeping buttercup (*Ranunculus repens*). Bracken was present within the grassland, although patches were small, and infrequent throughout the parcel. The species assemblage was considered to be indicative of modified grassland. As a result of the lack of species diversity, the grassland was considered to be of poor condition.

4.1.1.5 Bracken

Habitat parcels 47 and 49 were areas dominated by bracken, situated at the side of the A82. A low abundance of willowherb (*Epilobium* sp.) was also present. As per the relevant guidance, it was not considered to be necessary to afford a condition to this habitat type (DEFRA, 2024).

4.1.2 Nether Lochaber Construction Compound Site

Six different habitat types were identified within the Nether Lochaber Construction Compound Site, as shown in Table 4.1.2. Detailed descriptions of each habitat parcel making up the Nether Lochaber Construction Compound Site are provided in the sections below. The location of each habitat parcel within the Nether Lochaber Construction Compound site is shown in Drawing 99_DRG_32_1. The condition of each habitat parcel is shown in Drawing 99_DRG_29_1.

Table 4.1.2: Habitats Present within the Nether Lochaber Construction Compound Site Survey Area

Habitat Type	Condition	Total Area (Ha)	Associated Habitat Parcels
Other Broadleaved Woodland	Poor	0.075	• 29 • 30 • 59
Degraded Blanket Bog	Poor	0.491	• 56 • 58
Other Wetlands	Poor	0.146	• 57
Individual Trees	Moderate	0.123	• 36 • 37 • 38
Vacant or Derelict Land	Poor	0.185	• 31
Developed Land – Sealed Surface	N/A	0.072	• 32

4.1.2.1 Other Broadleaved Woodland

There are three parcels of woodland habitat situated on the eastern and southern edges of the existing construction compound (habitat parcels 29, 30 and 59). These areas of woodland were largely similar, although slight differences were identified in the species composition.

Habitats parcels 29 and 59 were largely dominated by silver birch with an understorey of crack willow and rowan. A mix of rhododendron, bramble and gorse made up much of the understorey. The ground vegetation layer included bracken, nettle (*Urtica dioica*), willowherb,

cotoneaster (*Cotoneaster* sp.) and creeping buttercup. The woodland appeared to be relatively young in age, resulting in a lack of structural diversity and features associated with old growth. In addition, the understorey was largely comprised of an INNS, hence the woodland parcels were considered to be of poor condition.

Habitat parcel 30 contained a similar species composition as habitat parcel 29, although an addition tree species, wild cherry (*Prunus avium*), was identified within the canopy. Rush was present within the ground vegetation layer, suggesting that the ground-water level may have been higher than that of habitat parcel 29. As well as rhododendron, buddleia (*Buddleja davidii*), another INNS, was also identified within the ground vegetation of habitat parcel 30. As such, habitat parcel 30 was also considered to be of poor condition.

4.1.2.2 Degraded Blanket Bog

Towards the west of the existing construction compound, there were two areas of degraded blanket bog (habitat parcels 56 and 58), which were separated by an area of degraded wetland (see Section 4.1.2.3: Other Wetlands). The species composition and degraded micro-topographical structure was indicative of degraded blanket bog (UKHab, 2023), which is expected to be a result of previous management and usage of the site.

Habitat parcel 56 was largely dominated by purple moor-grass (*Molinia caerulea*), deergrass (*Trichophorum cespitosum*) and common bent (*Agrostis capillaris*), although there were large patches dominated by ericoid species and rushes. Other species present included, cotton-grass (*Eriophorum angustifolium*) and pointed spear-moss (*Calliergonella cuspidata*). Sphagnum moss (*Sphagnum* spp.) was present throughout the habitat area, although the substrates were generally drier than would be expected for a healthy sphagnum community to persist. It is anticipated that this is a result of artificial drainage. As a result of degradation, the habitat was considered to be of poor condition.

Habitat parcel 58, situated towards the south of habitat parcel 57, was largely dominated by cotton-grass, purple moor-grass and patches of rushes. Individual rhododendron plants were frequent within the habitat area, and there were a small number of silver birch saplings. Other species present included deergrass, lesser spearwort (*Ranunculus flammula*), and pointed spear-moss. Unlike habitat parcel 56, sphagnum did not appear to be present and throughout the habitat area were patches of bare peat. As a result of degradation, the habitat was considered to be of poor condition.

4.1.2.3 Other Wetlands

Habitat parcel 57 was situated between habitat parcels 56 and 58. The habitat was unusual and did not wholly align with any of the habitat classification, however species present were characteristics of wetlands habitats. It is expected that the unusual species composition and structure is due to the previous land use. It appears that the area was once developed with some hard-standing gravel, which has since been largely overgrown, due to succession from the neighbouring habitats. As the ground level is this area is slightly lower than the adjacent land parcels, it is expected that the area may retain water for large periods of the year. Rushes largely dominated the habitat parcel, however, patches of bulrush (*Typha latifolia*) were present throughout. Other species present were similar to that of the adjacent land parcels, including cotton-grass, willowherb, purple moor-grass and deergrass. A low abundance of grey willow and rhododendron was also present. There were patches of bare gravel and peat throughout the habitat parcel. As a result of the lack of species diversity and the previous

damage to the habitat parcel, due to development, the habitat was considered to be of poor condition.

4.1.2.4 Individual Trees

Three individual trees were recorded towards the south-west of the Nether Lochaber Construction Compound Site, within habitat parcels 36, 37 and 38.

Habitat parcel 36 was associated with a Scots pine (*Pinus sylvestris*). The tree poor vitality, likely due to being situated within a degraded bog. The Scots pine appeared to be semi-mature, although it was difficult to fully determine, as trees generally grow smaller in the adverse condition of a bog. Several of the limbs showed evidence of damage, likely due to mechanical trauma, based on the tearing. As such, despite providing some opportunities for wildlife, the habitat provided by the tree was considered to be of moderate condition.

Habitat parcels 37 and 38 were associated with two individual silver birch. Both trees were semi-mature and appeared to show signs associated with low vitality, likely due to the adverse growing conditions of the bog. Evidence of mechanical trauma was noted on some of the branches. Hence, both habitat areas associated with the individual trees were considered to be of moderate condition.

4.1.2.5 Vacant or Derelict Land

Habitat parcel 31 was comprised of a former construction compound. As a result of age and/or lack of maintenance, the hard standing concrete has begun to crack and plant species were growing through in places. Species present included Yorkshire fog, horsetail (*Equisetum* sp.), greater plantain, broad-leaved dock and common bent. Buddleia was present, alongside other flowering species such as creeping buttercup, common daisy, willowherb and colt's-foot (*Tussilago farfara*). Patches of gorse were present at the perimeter of the hard standing, though it should be noted that all vegetation present within this area was sparse and limited. The habitat parcel was considered to be of poor condition, due to the lack of species and structural diversity of the plant assemblage.

4.1.2.6 Developed Land – Sealed Surface

Habitat parcel 32 consists of a large pile of aggregate. No vegetation growth was present in this area. As per the relevant guidance, it was not considered necessary to afford a condition to this habitat type (DEFRA, 2024).

4.1.3 Ardgour Development Site

Five different habitat types were identified within the Ardgour development site, as shown in Table 4.1.3. Detailed descriptions of each habitat parcel making up the Ardgour development site are provided in the sections below. The location of each habitat parcel within the Ardgour development site is shown in Drawing 99_DRG_30_1. The condition of each habitat parcel is shown in Drawing 99_DRG_27_1.

Table 4.1.3: Habitats Present within the Ardgour Development Site Survey Area

Habitat Type	Condition	Total Area (Ha)	Associated Habitat Parcels
Other Broadleaved Woodland	Poor	0.015	• 21
Modified Grassland	Poor	0.187	• 14 • 20 • 24 • 25 • 55
Individual Trees	Moderate	0.086	• 16 • 17 • 19 • 22 • 23 • 26
Individual Trees	Good	0.041	• 27
Bare Ground	Poor	0.039	• 28
Developed land – Sealed surface	N/A	0.313	• 52 • 54

4.1.3.1 Other Broadleaved Woodland

Habitat parcel 21 was a small, wooded area situated at the end of a residential street. There did not appear to be any particular dominant species type, although the majority canopy was comprised of broadleaved species. Tree species present included sycamore, holly, western red cedar (*Thuja plicata*), alder and wild cherry. The trees all appeared to be of relatively similar age, and no evidence of regeneration was identified. The understorey was predominantly comprised of rhododendron, although bramble was also present. A full assessment of the ground vegetation was limited by access to the woodland parcel. However, the ground vegetation appeared to be relatively sparce, due to the shaded nature of the habitat parcel. Common grass species, such as perennial ryegrass and common forb species, such as nettle were identified. As a result of the lack of species and structural diversity and the presence of INNS, the woodland was considered to be of poor condition.

4.1.3.2 Modified Grassland

A large area of grazing pasture within the Ardgour development site was predominantly comprised of habitat parcel 14. No livestock were present at the time of survey, however damage caused by grazing pressures was noticeable. The habitat parcel was dominated by grasses, which appeared to be largely comprised of common bent and Yorkshire fog, however, the number of species identified was limited, due to grazing damage. Forb species identified within the habitat parcel included rough hawkbit (*Leontodon hispidus*), creeping buttercup, common daisy, ribwort plantain (*Plantago lanceolata*), nettle, common mouse-ear (*Cerastium fontanum*) and Yorkshire fog. Patches of rushes were present, although scattered and infrequent. The species assemblage was considered to be indicative of grassland modified for agricultural purposes. Despite the diversity of forb species identified, the low abundance and infrequent nature of each species resulted in a grassland of poor condition.

Habitat parcel 20 was a small area of grassland situated to the rear of a residential garden, separating the grazing pasture from the residential area. The sward was generally dominated

by common bent, perennial ryegrass and Yorkshire fog. Forb species present included creeping buttercup, broad-leaved dock, heath bedstraw (*Galium saxatile*), thistle (*Cirsium* sp.), foxglove and nettle. Small infrequent patches of rhododendron and bramble were also present. Garden waste had been left within the habitat parcel, and it is expected that many of the species have arisen from the nearby gardens, hence, the species assemblage was considered to be indicative of modified grassland. As a result of the low species diversity, the grassland was considered to be of poor condition.

Habitat parcel 24 was a managed area of grassland, situated along the edge of a residential street. Species identification was limited due to damage caused by mowing, however, the species identified were indicative of modified grassland. Grass species present included crested hair-grass (*Koeleria macrantha*), perennial ryegrass, common bent, and Yorkshire fog. A low diversity of forb species was identified, including ribwort plantain, creeping buttercup, white clover and common daisy. As a result of physical damage caused by mowing and lack of diversity in structure and species, the habitat was considered to be of poor condition.

Habitat parcel 25 was situated to the very rear of the garden of the Corran Ferry Office. The habitat parcel was relatively similar to that of 24, immediately adjacent, although ornamental species were also present. Species identification was limited, due to damage caused by mowing and by access to the area, although perennial ryegrass appeared to be the dominant species. Bracken and bramble were present although only in small infrequent patches. An ornamental fuchsia (*Fuchsia* sp.) bush was present within the grassland. As a result of physical damage caused by mowing and lack of diversity in structure and species, the habitat was considered to be of poor condition.

Habitat parcel 55 was an area of mown and trampled grassland situated between the public highway and rock armour. Species identification was limited, due to damaged caused by damage, however it was evident that there was a limited number of species present. Forb species were indicative of improvement, including dandelion and white clover.

4.1.3.3 Individual Trees

Seven individual trees were recorded within the Ardgour development site. The habitat parcel is considered to be the area in which each tree occupied. Areas which were defined by individual trees included habitat parcels 16, 17, 19, 22, 23, 26 and 27.

Habitat parcels 16 and 17 were both identified as mature hawthorn trees. The trees were situated towards the north-west of the Ardgour development site on the edge on an area of grazing pasture, and to the rear of a residential garden. The hawthorn appeared to have relevantly low vitality, and it is expected that some damage may have occurred due to compaction of the rooting systems associated with the adjacent residential garden, compound area and grazing pasture. Nonetheless, features of old growth provided potential ecological niches for wildlife and the tree canopy was situated above grassland vegetation, hence the habitat provided by both trees was considered to be of moderate condition.

Habitat parcel 19 was associated with a mature Sitka spruce situated at the entrance of field which made up the southern area of the Ardgour development site. The tree appeared to have good vitality, and the canopy was predominantly situated over grassland vegetation. However, as a non-native species, with minimal opportunities for wildlife associated with ecological

niches, the habitat associated with the Sitka spruce was considered to be of moderate condition.

Habitat parcels 22 and 23 were both associated with wild cherry trees, situated within an area of modified grassland, towards the rear of the Corran Ferry Office garden. The trees were largely oversailing grassland vegetation. However, they did not exhibit perfect vitality, likely due to compaction of the roosting systems, associated with the managed grassland and reduced opportunities for rooting due to the adjacent road. Furthermore, former pruning wounds were identified, indicating that the trees had previously been managed. Hence, the habitat associated with both wild cherry trees was considered to be of moderate condition.

Habitat parcels 26 and 27 were both associated with silver birch trees situated within the rear garden of the Corran Ferry Office. The canopy of both trees was situated over grassland vegetation. The silver birch associated with habitat parcel 26 was semi-mature and there was evidence of material damage to several of the limbs, which look to be a result of mechanical trauma. Hence, the habitat associated with the tree was considered to be of moderate condition. The tree associated with habitat parcel 27 however was mature and did not appear to exhibit any evidence of former damage. Therefore, the habitat associated with the tree was considered to be of good condition.

4.1.3.4 Bare Ground

Habitat parcel 28 was comprised of a patch of bare soil located to the rear of the Corran Ferry Office. The bare soil appeared to have been recently dug and there was no evidence of vegetation. As such, the habitat was considered to be of poor condition.

4.1.4 Ardgour Construction Compound Site

Eight different habitat types were identified within the Ardgour Construction Compound Site, as shown in Table 4.1.4. Detailed descriptions of each habitat parcel making up the Ardgour Construction Compound Site are provided in the sections below. The location of each habitat parcel within the Ardgour construction compound site shown in Drawing 99_DRG_30_1. The condition of each habitat parcel is shown in Drawing 99_DRG_27_1.

Table 4.1.4: Habitats Present within the Ardgour Construction Compound Site Survey Area

Habitat Type	Condition	Total Area	Associated Habitat Parcels
Modified grassland	Poor	0.010	• 5 • 10
Modified grassland	Good	0.627	• 1 • 9 • 53 • 13
Rushes dominant	Poor	0.098	• 3 • 12
Gorse scrub	Poor	0.1	• 4 • 6 • 7 • 18
Supralittoral sediment	Poor	0.031	• 51
Vacant or Derelict Land	Poor	0.087	• 2 • 8

Habitat Type	Condition	Total Area	Associated Habitat Parcels
Artificial Unvegetated – Unsealed surface	N/A	0.151	• 11
Developed land – Sealed surface	N/A	0.024	• 15

4.1.4.1 Modified Grassland

Habitat parcel 1 was dominated by grasses, including common bent and crested hair-grass. Rush species were in high abundance but did not exceed 50% of the sward. A high abundance of forb species were present, although only four species were identified, including white clover, common selfheal (*Prunella vulgaris*), yarrow (*Achillea millefolium*), and creeping buttercup. A few small gorse bushes were scattered infrequently throughout the habitat parcel. The species assemblage indicates that there has been some modification to the habitat. However, due to the species and structural diversity within the sward, the low abundance of scrub and the lack of physical damage, bracken and INNS, the habitat parcel was considered to be in good condition.

Habitat parcel 5 was largely a continuation of habitat parcel 1, running as a strip from the larger area of habitat parcel 1 along the coastline. Nonetheless, the area of grassland associated with habitat parcel 5 had a much lower species diversity. The habitat parcel was damaged, due to grazing, hence species identification was limited, although perennial ryegrass appeared to dominate the habitat, with a low diversity of forb species including white clover, creeping buttercup and ribwort plantain. Gorse was present, although patches were small in size and infrequent. As a result of the lack of species diversity, the habitat was considered to be of poor condition.

Habitat parcels 9 and 53 were situated at the entrance of a field, on either side of a track. The area was dominated by grasses, including a mixture of perennial ryegrass and comment bent. A variety of forb species were identified, including Yorkshire fog, broad-leaved dock, creeping buttercup, greater plantain, and common mouse-ear. There were some scattered patches of rush throughout the habitat parcel. In addition, a low abundance of gorse was present, though the plants were scattered and infrequent. Habitat parcel 13 exhibited similar plant communities. Although the habitat parcels did display characteristics of neutral grassland, the species assemblage did not meet the criteria for classification, in particular the species diversity and presence of species generally associated with improvement. Hence, the species assemblage is considered to be more highly associated with modified grassland of good condition.

Habitat parcel 10 was dominated by grasses, including perennial ryegrass and common bent. Forb species within the sward included creeping buttercup, thistle, common mouse-ear, foxglove and common daisy. Small patches of rush were present throughout. Despite the diversity of species across the entirety of the habitat parcel, abundance of forb species was generally low and infrequent, hence the habitat was considered to be of poor condition, due to lack of species diversity.

4.1.4.2 Rushes Dominant

Habitat parcel 3 was dominated by rush, however there was a high abundance of gorse, hence there was considered to be some evidence of succession to a gorse scrub habitat (noting that the species assemblage did not yet meet the requirements to be considered gorse scrub). The habitat parcel was situated within a field currently used as sheep grazing pasture, hence the surrounding habitats were largely damaged by grazing, whilst the areas of rush were left untouched. A low diversity of forb species were recorded, including creeping buttercup, common bent and greater plantain. The species assemblage and current usage of the area were indicative of modified grassland, which was classified as being in poor condition, due to the lack of species diversity.

Habitat parcel 12 was an area dominated by rushes, situated with the grazing pasture largely associated with habitat parcel 9. Other species were present in low abundance, include thistle, common daisy, perennial ryegrass and creeping buttercup. The sward height was noted to be varied, however, due to the lack of species diversity the habitat was considered to be of poor condition.

4.1.4.3 Gorse Scrub

Small areas of gorse were present throughout the southern area of the Ardgour Construction Compound Site, including habitat parcels 4, 6 and 7. The gorse within each of the habitat parcels was dense and of similar height. Due to the width and size of the habitat parcels the edge was undeveloped and there were limited opportunities for microclimates, such as glades. Therefore, the areas of gorse were considered to be of poor condition.

A dense area of gorse scrub lies towards the west of the large grazing pasture (habitat parcel 18). The area of gorse was inaccessible at the time of survey. However, it was evident that rhododendron was present, and that there was limited structural diversity, for example, a lack of glades and rises. Hence, this habitat parcel was considered to be of poor condition.

4.1.4.4 Supralittoral sediment

Habitat parcel 51 was an area of pebbled beach situated above the tide line, exhibiting no vegetation growth. Due to the lack of any vegetative structure, this habitat parcel could not be defined further under the UKHab classification system. As the habitat did not fit to any specific habitat classification, no baseline condition sheet was considered to be applicable to this habitat parcel. However, with consideration of the requirements to attain a high condition for most similar habitat types, it was determined using professional judgement that habitat parcel 51 should be considered to be of poor condition. Although this habitat lies within the Planning Boundary, it is not expected that any changes will occur to this area as a result of the CFIIS, and therefore the habitat parcel has been excluded from the biodiversity metric.

4.1.4.5 Vacant or Derelict Land

Habitat parcel 2 was predominantly a gravelled seating area situated towards the south of the Ardgour construction compound site. As a result of lack of maintenance, vegetation had begun to grow through the gravel, although only in small abundance (i.e., <10% of the area). Species present included common bent, yarrow, creeping buttercup, willowherb, white clover, Yorkshire fog and common selfheal. As a result of the lack of diversity within the structure of the vegetation and the low abundance of species suitable for wildlife, the habitat was considered to be of poor condition.

Towards the west of the Ardgour construction compound site was a former compound site, situated towards west of an agricultural field (habitat parcel 8). The area appeared to have formerly been surfaced with gravel and concrete in some places, although the hard standing was heavily degraded, and vegetation was growing throughout the former compound. Species present included nettle, willowherb, white clover, common bent, common selfheal, perennial ryegrass, ribwort plantain and common daisy. As a result of the lack of diversity within the structure of the vegetation and the low abundance of species suitable for wildlife, the habitat was considered to be of poor condition.

4.1.4.6 Artificial Unvegetated – Unsealed Surface

An area of artificial unvegetated – unsealed surface was present within the Ardgour construction compound site (habitat parcel 11). Habitat parcel 11 was a gravel road which ran from the A861 up to the existing construction compound area outlined in Section 4.1.4.5: Vacant or Derelict Land. As a result of lack of maintenance, vegetation had begun to grow through the gravel, although only in small abundance (i.e., <10% of the area). Species present included common bent, creeping buttercup, white clover, dandelion, rush, Yorkshire fog, common daisy, foxglove, willowherb and crested hair-grass. As per the relevant guidance, it was not considered to be necessary to afford a condition to this area of artificial unvegetated – unsealed surface (DEFRA, 2024).

4.2 Linear Habitats

No linear habitats were recorded during the site survey, and therefore, linear habitats will not be considered further within this document.

4.3 Watercourse Habitats

The only watercourse within the proposed Planning Boundary is an unnamed watercourse in Nether Lochaber, which intersects the site for 51.5 metres (m) in length (hereafter referred to as 'Nether Lochaber watercourse). The Nether Lochaber watercourse was characterised into three sections; two as 'other rivers and streams' (Sections 2 and 3) and 'culvert' (Section 1) as per Table 10 of 'The Statutory Biodiversity Metric User Guide' (DEFRA, 2024), and does not meet the criteria for 'priority habitat' (DEFRA, 2024). In particular, the Nether Lochaber watercourse lacks in width, depth and sinuosity (i.e., bends), largely due to its status as run-off through a partly urban area with riparian encroachment through the open channel section of 34m in length, and is culverted for 17.5m in length.

The condition of Section 1 (the pipe culvert) was not assessed, as culverts do not require a condition assessment (DEFRA, 2024). The remaining watercourse within the Planning Boundary was assessed as an open channel, characterised as 'other rivers and streams', along with a 10m buffer from both banks. This length was split into two sections, denoting Section 2 as a length of open channel which will be culverted as art of the CFIIS, and Section 3 which will remain as open channel. This watercourse was characterised as a Type C river, the channel bed displaying as dominated by bedrock, boulders and cobbles. Part of this section (5m in channel length) was covered by an open bottomed bridge, with stone bridge abutments. Both banks at the upstream end were engineered; the pipe culvert conveying flow under the A82 was protected by a concrete headwall and apron, with stone or mortar headwalls for a short length. The riparian zone on both banks was comprised of broadleaved woodland and scrub (see Section 4.1.1.1: Other Broadleaved Woodland). This led to a boundary wall with an asphalt footpath

and narrow grass verge to the furthermost extent of the 10m buffer on the left bank, and a natural slope to the furthermost extent on the right bank. It is noted that the riparian zone on both banks contained INNS (as rhododendron covered approximately 30% of the area).

5 Mitigation Hierarchy Implementation

During the Habitat Survey and BCA, areas of degraded peatland (degraded blanket bog) habitat were identified at the proposed Nether Lochaber construction compound site (Habitat parcels 56 and 58). Peatland is considered to be an irreplaceable habitat (see Section 3.1: Approach to Biodiversity Enhancement). Despite its degraded condition, the peatland habitat will still provide important ecosystem services, including carbon sequestration. At the time of survey, the proposed Planning Boundary overlapped part of this peatland habitat. These findings were relayed back to the developer, and following the mitigation hierarchy, the planning red line boundary was amended to exclude the peatland from the CFIIS consent boundary. The movement of the redline boundary to avoid irreplaceable habitats demonstrates the best outcome from use of the mitigation hierarchy, in line with the policies of NPF4, local development plan and relevant consultation and guidance. Note habitat parcel 57 (other wetlands) has also been excluded from the Planning Boundary.

6 Baseline Condition Assessment

The baseline summary includes the findings of the Habitat Survey and BCA for all habitat parcels located within the Planning Boundary. Noting that any habitat parcels detailed above that were excluded post survey are not included within this section, although the result may be used to identify opportunities for habitat enhancement/creation in the future.

6.1 Area Habitats Baseline

In total, 48 habitat parcels of 14 of different habitat types were mapped and recorded within the CFIIS Planning Boundary, as per the methodology outlined in Section 3: Methodology. Results that were inputted to the metric, i.e., habitat parcels within the Planning Boundary, are shown in Table 6.1.1.

Table 6.1.1: Area Habitats Identified within the Proposed Planning Boundary and Associated Biodiversity Area Habitat Units

Broad Habitat Type	Habitat Type	Area (ha)	Area Habitat Units
Woodland and forest	Other woodland; Broadleaved	1.355	10.02
	Other woodland; mixed	0.046	0.18
	Other coniferous woodland	0.110	0.22
Urban	Vacant or derelict land	0.272	0.54
	Artificial unvegetated, unsealed surface	0.151	0.00
	Developed land; sealed surface	0.948	0.00
	Bare Ground	0.039	0.08
Individual trees	Urban tree	0.115	1.08
Heathland and shrub	Gorse scrub	0.1	0.4
	Mixed scrub	0.005	0.02
Grassland	Modified grassland	0.513	4.40
	Rushes dominant	0.53	0.2
	Bracken	0.094	0.19
	Total	**4.278**	**17.32**

Habitat parcels across the full survey area varied in habitat type and composition within habitat types. This report has summarised the habitat types identified across the full survey area and within the CFIIS. The majority (27 habitat parcels) of habitat parcels identified within the Planning Boundary were calculated to be poor condition, with five assigned good condition.

6.2 Watercourse Habitats Baseline

In total, 51.5m of the Nether Lochaber watercourse was mapped and recorded. Note the lengths are defined in km in the table below to align to the metric calculator tool. 17.5m of the Nether Lochaber watercourse was culverted, and 34.0m was an open channel, characterised as a River Type C. This was classified as in 'moderate' condition with minor encroachment to both banks.

Section 1 of the watercourse (the culverted section) generated 0.02 watercourse habitat units. Section 2 generated 0.10 watercourse habitat units, and Section 3 generated 0.21 watercourse habitat units. In total, the watercourse generated 0.35 watercourse habitat units, as shown in Table 6.2.1.

Table 6.2.1: Watercourse Habitats Identified within the Proposed Planning Boundary and Associated Condition and Watercourse Habitat Units

Watercourse Section No.	Watercourse Type	Length (km)	Habitat Distinctiveness	Condition	Watercourse Habitat Units
1	Culvert	0.0175	Low	Poor	0.02
2	Other rivers and streams	0.011	Low	Moderate	0.1
3	Other rivers and streams	0.023	Low	Moderate	0.21
				Total	**0.33**

It is anticipated that 11.0m of the open channel of the Nether Lochaber watercourse will be culverted as part of the development, and therefore 0.1 watercourse habitat units will be lost.

7 Conclusion

The construction of the CFIIS will result in the removal of 17.32 area habitat biodiversity units and 0.10 watercourse habitat units. THC has committed to providing 19.05 of area habitat biodiversity units and 0.11 of watercourse habitat units (as defined by Natural England's current statutory metric) to fulfil THC's Biodiversity Enhancement requirements. A Habitat Management Plan will be developed and implemented in order to present the appropriate way forward for biodiversity enhancement associated with this development.

8 References

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9 Glossary

Acronym	Definition
BCA	Baseline Condition Assessment
CFIIS	Corran Ferry Infrastructure Improvement Scheme
cm	Centimetres
DBH	Diameter at Breast Height
DEFRA	Department for Environment, Food and Rural Affairs
EIA	Environmental Impact Assessment
ha	Hectares
HwLDP	Highland-wide Local Development Plan
INNS	Invasive Non-Native Species
km	Kilometres
m	Metres
MoRPh	Modular River Physical
NPF4	National Planning Framework 4
QGIS	Quantum Geographic Information System
RCA	River Condition Assessment
THC	The Highland Council
UK	United Kingdom
UKHab	UK Habitat Classification

Appendix 1: Condition Assessment Forms

These are submitted as an excel spreadsheet with multiple tabs, so are not appended to this document but submitted as a separate file entitled: 99_FOR_04 CFIIS Condition Assessment Forms.

Appendix 2: Species List

Species	Common Name
Acer pseudoplatanus	Sycamore
Achillea millefolium	Yarrow
Agrostis capillaris	Common bent
Alnus glutinosa	Alder
Bellis perennis	Common Daisy
Betula pendula	Silver Birch
Buddleja davidii	Buddleia
Calliergonella cuspidata	Pointed Spear-moss
Carex spp.	Sedge
Cerastium fontanum	Common Mouse-ear
Cirsium sp.	Thistle
Corylus avellana	Hazel
Cotoneaster sp.	Cotoneaster
Crataegus monogyna	Hawthorn
Deschampsia cespitosa	Tufted Hairgrass
Digitalis purpurea	Foxglove
Epilobium sp.	Willowherb
Equisetum sp.	Horsetail
Eriophorum angustifolium	Cotton-grass
Fraxinus excelsior	Ash
Fuchsia sp.	Fuchsia
Galium saxatile	Heath Bedstraw
Hedera helix	Ivy
Heracleum sphondylium	Common hogweed
Holcus lanatus	Yorkshire Fog
Ilex aquifolium	Holly
Juncus spp.	Rush
Koeleria macrantha	Crested hair-grass
Larix decidua	Larch
Leontodon hispidus	Rough Hawkbit
Lolium perenne	Perennial ryegrass
Molinia caerulea	Purple Moor-grass
Montbretia Crocosmia x crocosmiiflora	Montbretia
Oxalis acetosella	Wood Sorrel
Picea sitchensis	Sitka Spruce
Pinus sylvestris	Scots Pine
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Prunella vulgaris	Common Selfheal
Prunus avium	Wild Cherry
Pteridium aquilinum	Bracken
Ranunculus flammula	Lesser Spearwort
Ranunculus repens	Creeping Buttercup
Reynoutria japonica	Japanese Knotweed
Rhododendron ponticum	Rhododendron
Rubus fruticosus	Bramble
Rumex obtusifolius	Broad-leaved Dock

Species	Common Name
Salix cinerea	Grey Willow
Salix fragilis	Crack willow
Senecio jacobaea	Ragwort
Sorbus aucuparia	Rowan
Sphagnum spp.	Sphagnum Moss
Taraxacum officinale	Dandelion
Thuja plicata	Western Red Cedar
Trichophorum cespitosum	Deergrass
Trifolium repens	White Clover
Tussilago farfara	Colt's-foot
Typha latifolia	Bulrush
Ulex spp.	Gorse
Urtica dioica	Nettle

Drawings

99_DRG_27_1 Ardgour Biodiversity Considerations Map

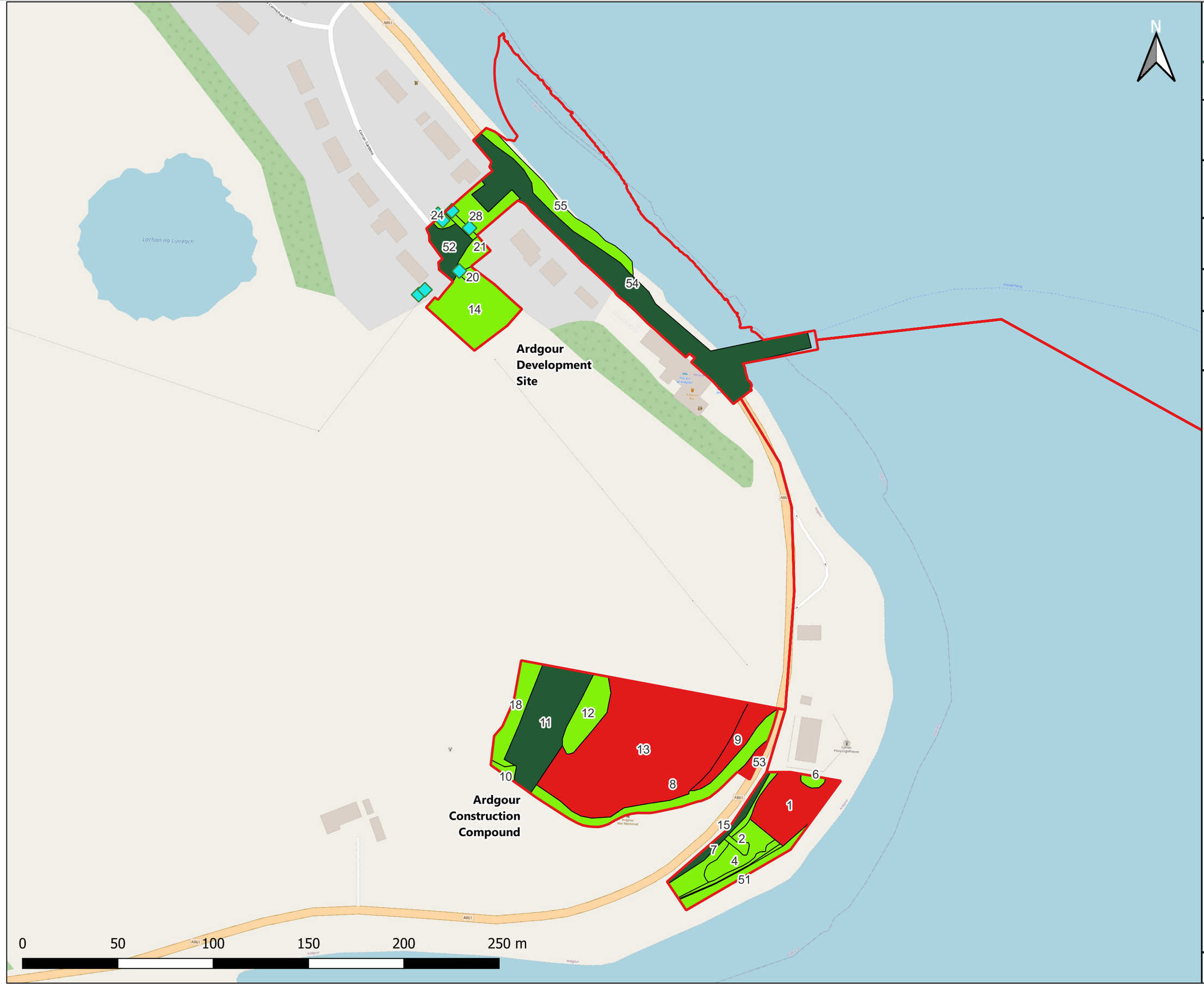
99_DRG_28_1 Nether Lochaber Development Site Biodiversity Considerations Map

99_DRG_29_1 Nether Lochaber Construction Compound Biodiversity Considerations Map

99_DRG_30_1 Ardgour Development Site UKHab Classification

99_DRG_31_1 Nether Lochaber Development Site UKHab Classification

99_DRG_32_1 Nether Lochaber Construction Compound UKHab Classification



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Telephone: 01808 521 498
Email: info@affriclimited.co.uk
www.affriclimited.co.uk

Title: 99_DRG_27_1 Ardgour Biodiversity Considerations Map

Projection: OSGB 1936/British National Grid
EPSG: 27700

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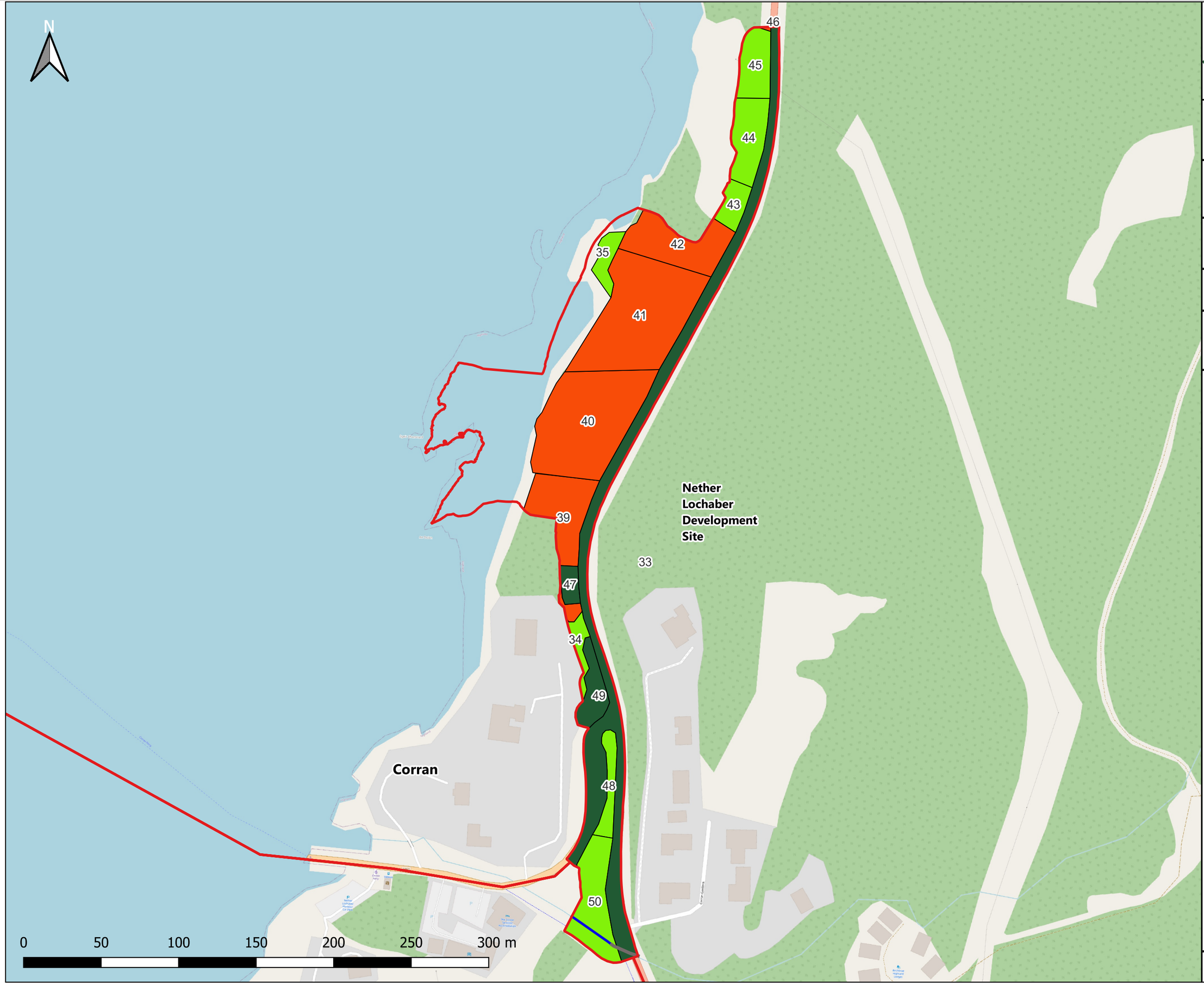
Legend

- Planning Boundary
- Individual Trees

Area Habitat Condition

- Good
- Moderate
- Poor
- N/A



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Title: 99_DRG_28_1 Nether Lochaber Development Site Biodiversity Considerations Map

Projection: OSGB 1936/British National Grid
EPSG: 27700

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Legend

- Planning Boundary
- Culvert N/A
- Type C River Moderate Condition

Area Habitat Condition

- Good
- Moderate
- Poor
- N/A

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Title: 99_DRG_29_1 Nether Lochaber Construction Compound Biodiversity Considerations Map

Projection: OSGB 1936/British National Grid
EPSG: 27700

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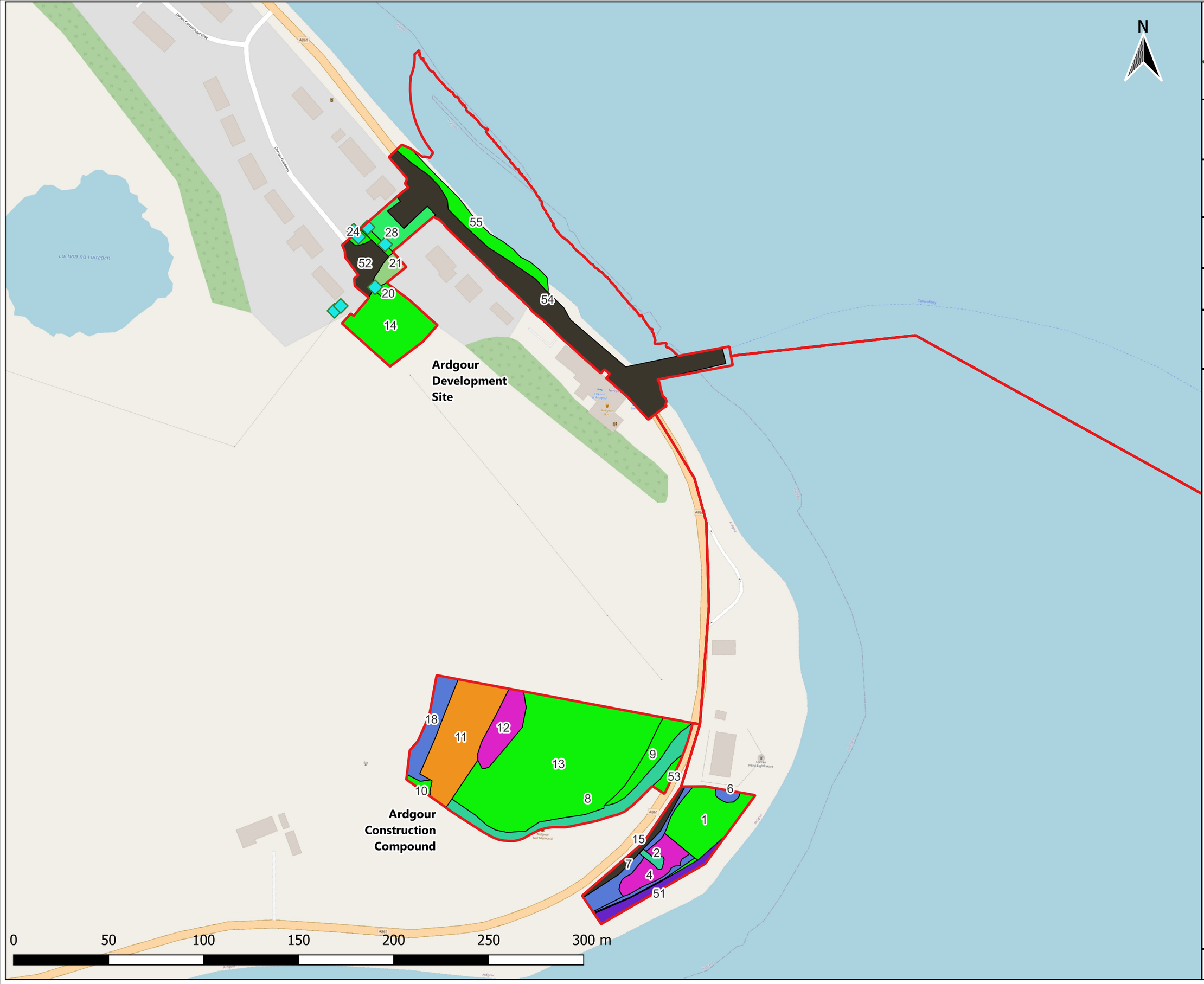
Legend

- Planning Boundary
- Individual_Trees

Area Habitat Condition

- Good
- Moderate
- Poor
- N/A
- Irreplaceable Habitat



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Title: 99_DRG_30_1 Ardgour Development Site UKHab Classification

Projection: OSGB 1936/British National Grid
EPSG: 27700

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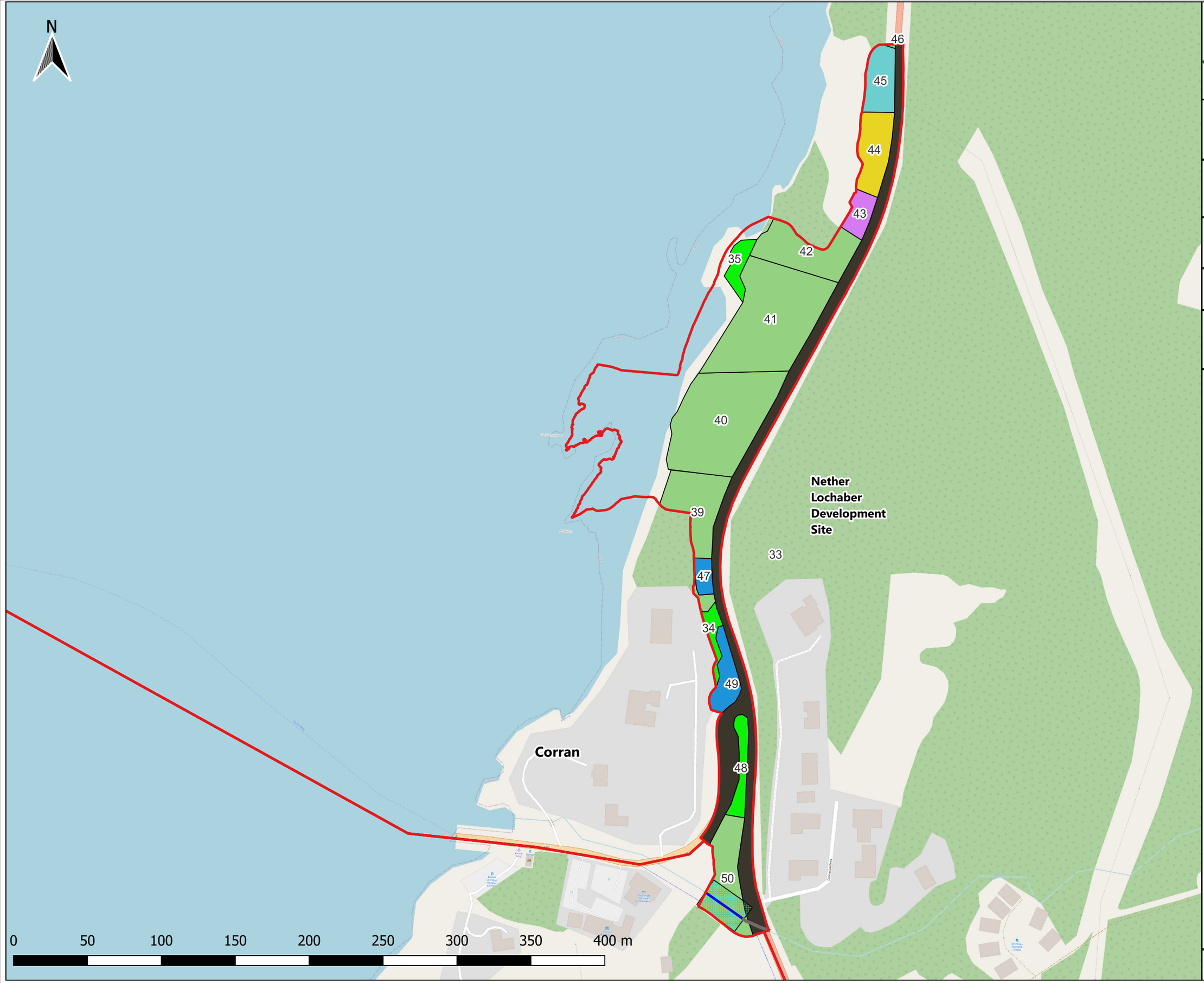
Legend

- Planning Boundary
- Individual_Trees

UKHab Classification

- Artificial unvegetated, unsealed surface
- Bare ground
- Supralittoral sediment
- Developed land; sealed surface
- Gorse scrub
- Modified grassland
- Modified grassland (Rushes dominant)
- Other woodland; broadleaved
- Vacant or derelict land



Affric
making it happen

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Title: 99_DRG_31_1 Nether Lochaber Development Site UKHab Classification

Projection: OSGB 1936/British National Grid
EPSG: 27700

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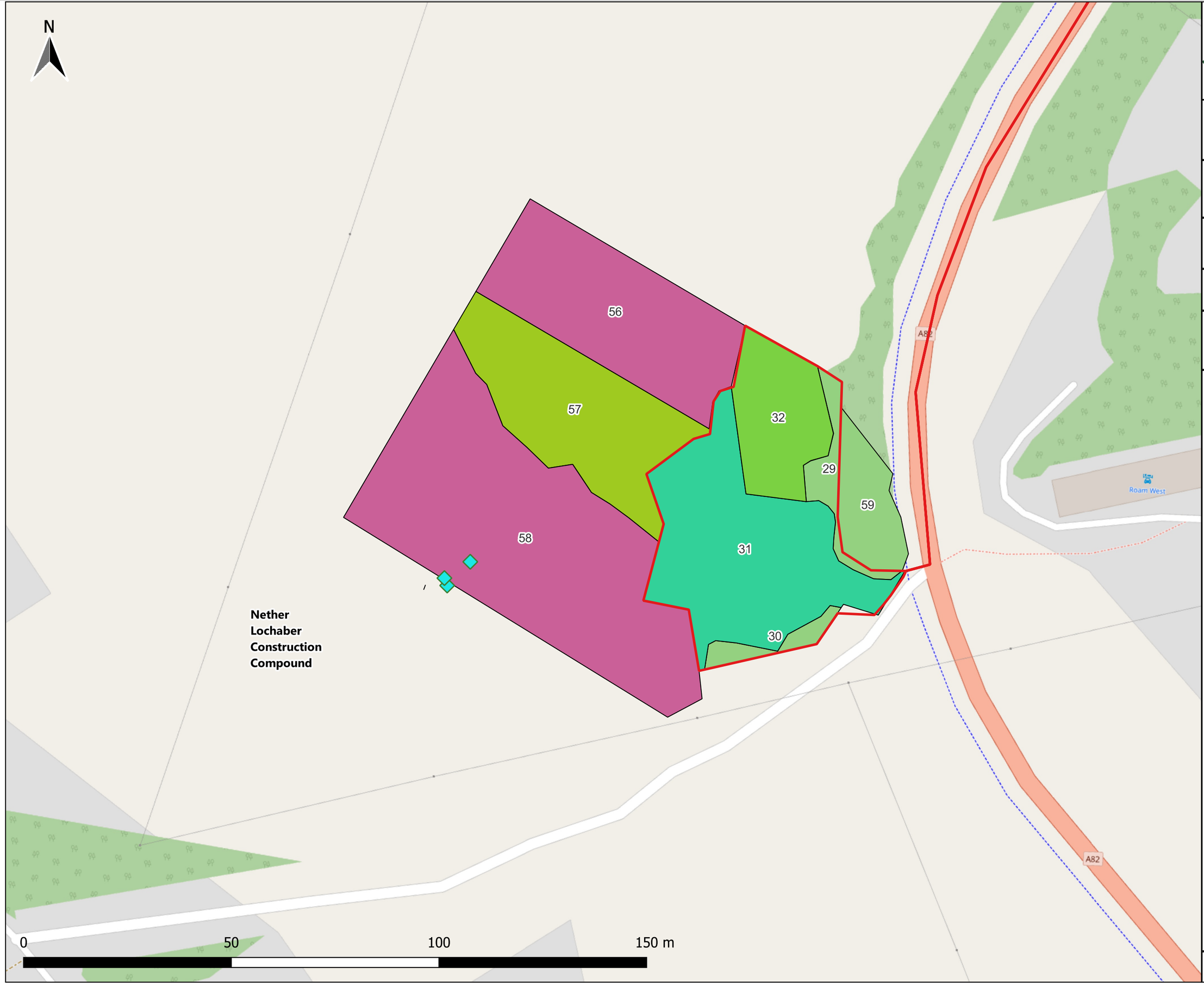
Legend

- Planning Boundary
- Culvert
- Nether Lochaber Watercourse
- Watercourse Assessment Buffer

UKHab Classification

- Bracken
- Developed land; sealed surface
- Mixed scrub
- Modified grassland
- Other coniferous woodland
- Other woodland; broadleaved
- Other woodland; mixed



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Title: 99_DRG_32_1 Nether Lochaber Construction Compound UKHab Classification

Projection: OSGB 1936/British National Grid
EPSG: 27700

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Legend

- Planning Boundary
- Individual_Trees

UKHab Classification

- Degraded blanket bog
- Developed land; sealed surface
- Other wetlands
- Other woodland; broadleaved
- Vacant or derelict land

Corran Ferry Infrastructure Improvement Scheme

Appendix K.6: Corran Woodland Ecological Survey Report

Wallace Stone
Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

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Corran Woodland Ecological Survey

A report for Affric Limited

by

N.G. Hodgetts & F. Maguire

October 2024

Corran woodland ecological survey

N.G. Hodgetts & F. Maguire

Introduction

A small area of woodland at Corran Ferry is likely to be affected by the Corran Ferry Infrastructure Improvement Scheme, a Highland Council initiative to upgrade the facilities at the ferry terminal at Loch Linnhe. The present survey is part of an ongoing project by Affric Limited (Affric) to ascertain the conservation value of this woodland and to mitigate the effects of proposed construction activities. The aim is to provide a comprehensive vascular plant and bryophyte survey, an indicative lichen survey and a superficial assessment of the fungi.

The main area examined consists of a narrow strip of mixed woodland with a more or less westerly aspect, north of the present ferry terminal between the main A82 and the east shore of Loch Linnhe (Fig. 1), at an altitude between 0 m and about 10 m. In addition, a small area south of the current ferry terminal, earmarked for a compound, was examined briefly. The geology consists of glacial deposits, but much modified on the surface by human activity. The site lies within the Highland Council area, and Watsonian vice-county 97 (West Inverness-shire). It is not within or particularly close to any areas with statutory protection (SSSI, SAC, etc).

According to the National Biodiversity Network Atlas (https://nbnatlas.org), there are plant records from this general area, but most are not precisely localised, and therefore may not be from the survey site itself. Because of the hyperoceanic climate of this area, several oceanic species have been recorded.

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Figure 1. Location of survey showing extent of proposed works, with strip of woodland at north end of site and compound area to south.

Methods

Fieldwork was carried out on 16 September 2024 by Ffion Maguire (Affric) and Nick Hodgetts (consultant). The site was walked, and lists were made on standard Biological Records Centre cards (RP25 for vascular plants and RP39 for bryophytes), with notes made on lichens and fungi. Further notes made where appropriate. Specimens were collected where necessary for later microscopic examination. The survey was limited to the area of woodland shown, plus the rocks between the woodland and high-water mark. Some digital photographs were taken in the field. Nomenclature follows Stace (2022) for vascular plants, Blockeel *et al.* (2021) for bryophytes, the British Lichen Society Taxon Dictionary for lichens (Lichen Taxon Dictionary | The British Lichen Society) and various nomenclature guides suitable for fungi taxonomical identification. Species in the Lobarion lichen community are listed according to James *et al.* (1977). Frequency of species is shown on the DAFOR scale. Oceanic, or 'Atlantic', bryophytes, according to the definitions of Hill *et al.* (2007), and 'Western British' bryophytes, as defined by Ratcliffe (1968), are highlighted. Nationally Scarce vascular plants are listed according to the current list on the BSBI website (https://bsbi.org/taxon-lists).

Results

A total of 104 vascular plant species (Table 1) and 73 bryophyte species were recorded (Table 2). In addition, 31 lichens and 10 fungi were identified (Table 3).

The woodland consists of a mixed stand above the rocky shoreline that has been extensively influenced by human activities. It includes areas of grown-out hazel *Corylus avellana* coppice, some evenly-aged stands of planted alder *Alnus glutinosa*, and conifer stands, including some large specimen trees of Norway spruce *Picea abies*. Birch *Betula pubescens*, sycamore *Acer pseudoplatanus* and willows *Salix* spp. have

also colonised the area, presumably through natural processes, along with smaller numbers of ash *Fraxinus excelsior*, holly *Ilex aquifolium* and rowan *Sorbus aucuparia*. There is the remains of an old croft house in the wood, with accompanying anthropogenic vegetation (e.g. elder *Sambucus nigra*, stinging nettles *Urtica dioica*). There is also much rubbish, including rusting metal, bottles, rubble, and a lot of expanded polystyrene, all of which are being colonised by bryophytes and other plants.

The ground flora is not particularly diverse, dominated over large areas by ferns, particularly *Dryopteris* spp., and grasses such as common bent *Agrostis capillaris* and tufted hair-grass *Deschampsia cespitosa*, with smaller areas dominated by other plants, notably bugle *Ajuga reptans* and the invasive alien Japanese knotweed *Reynoutria japonica*. Beneath the vascular plant vegetation, the bryophyte layer is dominated by common, large pleurocarpous mosses, including *Eurhynchium striatum*, *Hylocomium splendens*, *Loeskeobryum brevirostre* and *Rhytidiadelphus* spp. These often extend to colonising rocks and other debris. Locally there are stands of *Sphagnum quinquefarium* on banks, the only bog-moss found during the survey.

Rock outcrops provide some variety, with beech fern *Phegopteris connectilis* occasional. There are some small streams running through the woodland or seeping from drainage culverts in the road above, leading to locally swampy patches with (for example) opposite-leaved golden saxifrage *Chrysosplenium oppositifolium, Hookeria lucens, Polytrichum commune* and *Rhizomnium punctatum*. Where the streams emerge from the woodland onto the shoreline, there are some humid and shady rocky outcrops that are fairly rich in bryophytes, including *Lejeunea* spp., *Plagiochila bifaria*, *Radula* spp., *Saccogyna viticulosa* and *Thamnobryum alopecurum*. *Dermaotcarpon* lichens were also found in this habitat.

Epiphytic bryophyte and lichens are abundant. Among the bryophytes, *Frullania* spp., *Hypnum* spp. *Isothecium* spp., *Metzgeria furcata* and *Ulota* spp. are common throughout. Hazel has much *Lejeunea* spp., *Microlejeunea ulicina*, *Radula complanata*, etc, and ash supports in addition *Neckera complanata* and *Zygodon conoideus*. There is a wide variety of lichens, especially on hazel, with *Cetrelia olivetorum*, *Cladonia coniocraea*, *Hypotrachyna revoluta*, *Normandina pulchella*, *Pannaria* spp., *Parmelia* spp. (in the broad sense), *Platismatia glauca*, etc. The Lobarion community is represented by *Lobaria pulmonaria*, *Gabura fascicularis* (Fig. 2), *Parmeliella thriptophylla* (Fig. 3), *Pectinia atlantica* and *Sticta sylvatica*. Crustose lichens were not surveyed in detail, but include a wide variety of species, including abundant *Lepra amara*. A stand of Wilson's filmy fern *Hymenophyllum wilsonii* was found growing on a standing dead tree (which was believed to be ash).

There is much dead wood on site, including standing dead timber, tree stumps and fallen rotting logs. These are valuable for are range of plants and fungi, including the liverworts *Calypogeia fissa* and *Cephalozia curvifolia*. Several colonies of glue fungus *Hymenochaete corrugata* were seen, but no hazel gloves *Hypocreopsis rhododendri*.

Alien plants are much in evidence, presumably escaped from nearby gardens, including rhododendron *Rhododendron ponticum*, Japanese knotweed, montbretia (*Crocosmia x crocosmiiflora*), fuchsia *Fuchsia* sp. and hydrangea *Hydrangea* sp.

The rocks between the woodland and Loch Linnhe support shoreline vegetation typical of the area. Orache *Atriplex* sp. and scurvygrass *Cochlearia* sp. occur on the ground between rocks, and thrift *Armeria maritima* and *Sedum anglicum* grow on the rocks, along with bryophytes including abundant *Schistidium maritimum* near the high water mark and *Frullania tamarisci*, *F. teneriffae*, *Ptychomitrium polyphyllum* and *Isothecium* spp, and lichens such as *Parmelia* spp., *Peltigera* spp. and *Xanthoria* spp. further up the shore.

The small area to the south that is proposed for a compound for storage etc is of no interest. Most of it is open flat gravel/hard standing, with a big pile of rubble. The few fringe areas of 'woodland' are nothing more than mixed scrub over rubble, with birch and willow, conifers, gorse, and butterfly-bush *Buddleia* sp. The herb layer is not really characteristic of woodland, with bramble, coltsfoot *Tussilago farfara*, soft rush and purple moor-grass. It is possible that surrounding open wet areas are of more interest, but these were not included in the survey. The species lists below do not include the compound area.

Table 1. Vascular plants recorded from Corran woodland.
Frequency on DAFOR scale: d = dominant, a = abundant, f = frequent, o = occasional, r = rare. The qualifier 'l' ('locally') is also used where appropriate.

Species	**Common name**	**Habitat**	**Frequency**	**Status**
Acer pseudoplatanus	sycamore	woodland	f	Least Concern
Agrostis capillaris	common bent	woodland	a	Least Concern
Ajuga reptans	bugle	woodland	o/la	Least Concern
Alnus glutinosa	alder	woodland	f	Least Concern
Angelica sylvestris	wild angelica	woodland	f	Least Concern
Armeria maritima	thrift	coastal rocks	o	Least Concern
Arrhenatherum elatius	false oat-grass	woodland	o	Least Concern
Athyrium filix-femina	lady fern	woodland	o	Least Concern
Atriplex sp.	orache	coastal rocks	o/lf	Least Concern
Betula pubescens	downy birch	woodland	f	Least Concern
Blechnum spicant	hard fern	woodland	f	Least Concern
Bromopsis ramosa	hairy brome	woodland	o	Least Concern
Calluna vulgaris	heather	woodland edge	o	Least Concern
Cardamine flexuosa	wavy bitter-cress	shaded rock crevices	r	Least Concern
Carex panacea	carnation sedge	turf on coastal rocks	r	Least Concern
Carex sylvatica	wood sedge	woodland	o	Least Concern
Centaurea nigra	common knapweed	woodland edge	o	Least Concern
Chamaenerion angustifolium	rosebay willowherb	woodland edge	r	Least Concern
Chrysosplenium oppositifolium	opposite-leaved golden saxifrage	wet ground in woodland	r	Least Concern
Cochlearia sp.	scurvygrass	among coastal rocks	o/lf	Least Concern
Corylus avellana	hazel	woodland	a	Least Concern

Species	Common name	Habitat	Frequency	Status
Crocosmia x crocosmiiflora	montbretia	woodland	f/la	-
Deschampsia cespitosa	tufted hair-grass	woodland	f	Least Concern
Dryopteris aemula	hay-scented buckler fern	woodland	r	Least Concern
Dryopteris affinis	golden scaly male fern	woodland	f/la	Least Concern
Dryopteris borreri	Borrer's scaly male fern	woodland	o	Least Concern
Dryopteris dilatata	broad buckler fern	woodland	a	Least Concern
Epilobium brunnescens	New Zealand willowherb	shaded rock crevices	r	-
Epilobium montanum agg.	broad-leaved willowherb	woodland	r	Least Concern
Equisetum arvense	field horsetail	woodland	r	Least Concern
Erica tetralix	cross-leaved heath	woodland edge	r	Least Concern
Festuca rubra agg.	red fescue	woodland	f	Least Concern
Festuca vivipara	viviparous fescue	woodland	o	Least Concern
Filipendula ulmaria	meadowsweet	woodland	o	Least Concern
Fraxinus exselsior	ash	woodland	o	Least Concern
Fuchsia sp.	fuschsia	woodland edge	r	-
Galium aparine	cleavers	woodland	r	Least Concern
Galium palustre	marsh bedstraw	wet ground in woodland	o	Least Concern
Galium saxatile	heath bedstraw	coastal rocks	o	Least Concern
Geranium robertianum	herb robert	woodland	o	Least Concern
Geum rivale	water avens	wet ground in woodland	f	Least Concern
Hedera helix	ivy	woodland	o	Least Concern
Heracleum sphondylium	hogweed	woodland edge	r	Least Concern
Holcus lanatus	Yorkshire fog	woodland edge	r	Least Concern
Hyacinthoides non-scripta	bluebell	woodland	r	Least Concern
Hydrangea sp.	hydrangea	woodland edge	r	-
Hymenophyllum wilsonii	Wilson's filmy fern	epiphytic on dead tree	r	Near Threatened
Hypericum androsaemum	tutsan	woodland	o	Least Concern
Hypericum maculatum	imperforate St. John's wort	woodland	r	Least Concern
Ilex aquifolium	holly	woodland	o	Least Concern
Jacobaea vulgaris	common ragwort	woodland edge	r	Least Concern
Juncus effusus	soft rush	wet ground in woodland	o	Least Concern
Larix sp.	larch	woodland	lf	-
Leucanthemum vulgare	oxeye daisy	woodland edge	r	Least Concern
Lonicera periclymenum	honeysuckle	woodland	f	Least Concern
Lotus corniculatum	birdsfoot trefoil	woodland	o	Least Concern
Luzula sylvatica	great wood-rush	woodland	f	Least Concern
Lycopus europaeus	gipsywort	woodland edge, wet ground	o/lf	Least Concern

Species	Common name	Habitat	Frequency	Status
Mahonia sp.?	mahonia	woodland edge	r	-
Mercurialis perennis	dog's mercury	woodland	o	Least Concern
Molinia caerulea	purple hair-grass	woodland	o	Least Concern
Myrica gale	bog myrtle	woodland edge	r	Least Concern
Narthecium ossifragum	bog asphodel	woodland edge	r	Least Concern
Oxalis acetosella	wood sorrel	woodland	f	Least Concern
Phegopteris connectilis	beech fern	woodland, among rocks	o	Least Concern
Picea abies	Norway spruce	woodland	f	-
Plantago lanceolata	ribwort plantain	among coastal rocks	o	Least Concern
Plantago maritima	sea plantain	among coastal rocks	o	Least Concern
Polypodium vulgare	common polypody	woodland, on rocks and logs	o	Least Concern
Polystichum aculeatum	hard shield-fern	woodland	r	Least Concern
Potentilla anserina	silverweed	among coastal rocks	o/lf	Least Concern
Potentilla erecta	tormentil	woodland edge	f	Least Concern
Pteridium aquilinum	bracken	woodland edge	o/la	Least Concern
Ranunculus repens	creeping buttercup	woodland	f	Least Concern
Reynoutria japonica	Japanese knotweed	woodland	o/la	-
Rhododendron ponticum	rhododendron	woodland	o	-
Rubus fruticosus agg.	bramble	woodland	a	Least Concern
Rubus idaeus	raspberry	woodland	f	Least Concern
Rumex acetosella	sheep's sorrel	woodland edge	r	Least Concern
Rumex crispus	curled dock	among coastal rocks	f	Least Concern
Salix aurita	eared willow	woodland	f	Least Concern
Salix cinerea	grey willow	woodland	f	Least Concern
Sambucus nigra	elder	woodland, by old house	r	Least Concern
Scrophularia nodosa	common figwort	woodland edge	r	Least Concern
Scutellaria galericulata	skullcap	among coastal rocks	r	Least Concern
Sedum anglicum	English stonecrop	coastal rocks	o	Least Concern
Silene dioica	red campion	woodland edge	r	Least Concern
Sonchus arvensis	perennial sowthistle	woodland edge	r	Least Concern
Sorbus aucuparia	rowan	woodland	f	Least Concern
Stachys palustris	marsh woundwort	woodland edge	o	Least Concern
Stellaria media	common chickweed	woodland	f	Least Concern
Succisa pratensis	devil's-bit scabious	woodland edge	f	Least Concern
Teucrium scorodonia	wood sage	woodland	f	Least Concern
Trifolium repens	white clover	woodland	o	Least Concern
Trifollium pratense	red clover	woodland edge	r	Least Concern
Tripleurospermum inodorum	scentless mayweed	woodland	r	Least Concern
Tripleurospermum maritimum	sea mayweed	among coastal rocks	o	Least Concern
Ulex europaea	gorse	woodland	o/lf	Least Concern
Urtica dioica	stinging nettle	woodland	r/lf	Least Concern

Species	Common name	Habitat	Frequency	Status
Vaccinium myrtillus	blaeberry	woodland	o/lf	Least Concern
Valeriana officinalis	common valerian	woodland edge	o	Least Concern
Veronica chamaedrys	germander speedwell	woodland edge	o	Least Concern
Vicia cracca	tufted vetch	woodland edge	r	Least Concern
Viola riviniana	dog violet	woodland	r	Least Concern

Table 2. Bryophyte species recorded from Corran woodland.
Frequency on DAFOR scale: d = dominant, a = abundant, f = frequent, o = occasional, r = rare. The qualifier 'l' ('locally') is also used where appropriate.

Species	Habitat	Frequency	Oceanicity	Status
Liverworts				
Calypogeia arguta	earth banks	r	-	Least Concern
Calypogeia fissa	rotting logs	r	-	Least Concern
Cephalozia bicuspidata	rotting logs	r	-	Least Concern
Cephalozia curvifolia	rotting logs	o	Western British	Least Concern
Conocephalum conicum	damp shaded bank	o	-	Least Concern
Conocephalum salebrosum	damp shaded bank	r	-	Least Concern
Diplophyllum albicans	shaded rocks	r	-	Least Concern
Frullania dilatata	epiphytic	a	-	Least Concern
Frullania tamarisci	epiphytic & on rocks	a	-	Least Concern
Frullania teneriffae	coastal rocks	o	Hyperoceanic southern-temperate	Least Concern
Lejeunea lamacerina	epiphytic & on rocks	f	Hyperoceanic southern-temperate	Least Concern
Lejeunea patens	epiphytic & on rocks	f	Hyperoceanic southern-temperate	Least Concern
Lepidozia reptans	rotting logs	o	-	Least Concern
Lophocolea bidentata	damp ground	r	-	Least Concern
Metzgeria furcata	epiphytic	a	-	Least Concern
Microlejeunea ulicina	epiphytic	f	-	Least Concern
Pellia epiphylla	damp banks	r	-	Least Concern
Plagiochila asplenioides	woodland floor	f	-	Least Concern
Plagiochila bifaria	damp shaded rocks	r	Hyperoceanic southern-temperate	Least Concern
Plagiochila porelloides	rocks & banks	f	-	Least Concern
Radula aquilegia	damp shaded rocks	r	Hyperoceanic southern-temperate	Least Concern
Radula complanata	epiphytic & on rocks	f	-	Least Concern
Saccogyna viticulosa	damp shaded rocks	o	Oceanic southern-temperate	Least Concern
Scapania gracilis	damp shaded rocks	r	Hyperoceanic southern-temperate	Least Concern
Scapania undulata	damp shaded rocks	r	-	Least Concern
Mosses				
Amphidium mougeotii	rock crevices	o	-	Least Concern
Breutelia chrysocoma	woodland floor	o	Hyperoceanic southern-temperate	Least Concern

Species	Habitat	Frequency	Oceanicity	Status
Bryum capillare	coastal rocks	o	-	Least Concern
Chionoloma tenuirostre	rock crevices	r	Western British	Least Concern
Cirriphyllum piliferum	woodland floor	o	-	Least Concern
Dicranella heteromalla	bare earth of tree-plate	r	-	Least Concern
Dicranum majus	banks	o	-	Least Concern
Dicranum scoparium	tree bases	o	-	Least Concern
Eurhynchium striatum	woodland floor	a	-	Least Concern
Fissidens dubius	rock crevices	f	-	Least Concern
Grimmia hartmanii	damp shaded rocks	r	Western British	Least Concern
Hookeria lucens	damp ground	o	-	Least Concern
Hylocomiadelphus triquetrus	woodland floor	f	-	Least Concern
Hylocomium splendens	woodland floor	f	-	Least Concern
Hyocomium armoricum	damp shaded rocks	f	Oceanic temperate	Least Concern
Hypnum andoi	epiphytic	a	-	Least Concern
Hypnum cupressiforme var. *cupressiforme*	rocks, banks, epiphytic	a	-	Least Concern
Hypnum cupressiforme var. *resupinatum*	coastal rocks	f	Western British	Least Concern
Isothecium alopecuroides	tree bases, rocks	f	-	Least Concern
Isothecium interludens	coastal rocks	o	Hyperoceanic southern-temperate	Least Concern
Isothecium myosuroides	tree bases, rocks	a	-	
Kindbergia praelonga	woodland floor	a	-	
Loeskeobryum brevirostre	woodland floor	f/la	-	Least Concern
Mnium hornum	woodland floor	o	-	Least Concern
Neckera complanata	epiphytic on ash	r	-	Least Concern
Plagiomnium undulatum	woodland floor	o	-	Least Concern
Plagiothecium undulatum	woodland floor	o	-	Least Concern
Pleurozium schreberi	woodland floor	o	-	Least Concern
Polytrichum commune	wet ground	o/lf		Least Concern
Polytrichum formosum	banks	r	-	Least Concern
Pseudoscleropodium purum	woodland floor	r	-	Least Concern
Ptychomitrium polyphyllum	coastal rocks	o/lf	Oceanic southern-temperate	Least Concern
Racomitrium aciculare	damp rocks	o/lf	-	Least Concern
Racomitrium heterostichum	coastal rocks	r	-	Least Concern
Rhizomnium punctatum	wet ground	lf	-	Least Concern
Rhytidiadelphus loreus	woodland floor	f	-	Least Concern
Rhytidiadelphus squarrosus	woodland floor	o	-	Least Concern
Schistidium apocarpum	coastal rocks	lf	-	Least Concern
Schistidium maritimum	coastal rocks	la	Oceanic boreal-temperate	Least Concern
Sciuro-hypnum plumosum	damp shaded rocks	f	-	Least Concern
Sphagnum quinquefarium	banks	o/lf	Western British	Least Concern

Species	Habitat	Frequency	Oceanicity	Status
Thamnobryum alopecurum	damp shaded rocks	o/lf	-	Least Concern
Thuidium tamariscinum	Least Concern	a	-	Least Concern
Trichostomum brachydontium	rock crevices	o	-	Least Concern
Ulota bruchii	epiphytic	o	-	Least Concern
Ulota intermedia	epiphytic	o	-	Least Concern
Ulota phyllantha	epiphytic	f	Oceanic boreal-temperate	Least Concern
Zygodon conoideus	epiphytic on ash	o	Oceanic temperate	Least Concern

Table 3. Lichens and fungi species recorded from Corran woodland.
Frequency on DAFOR scale: d = dominant, a = abundant, f = frequent, o = occasional, r = rare. The qualifier 'l' ('locally') is also used where appropriate.

Species	Habitat	Frequency	Lobarion species (*)	Status
Lichens				
Anaptychia runcinata	coastal rocks	lf	-	Least Concern
Cetrelia olivetorum	epiphytic	o	-	Least Concern
Cladonia coniocraea	epiphytic	f	-	Least Concern
Cladonia rangiformis	among coastal rocks	r	-	Least Concern
Coenogonium luteum	epiphytic	r	*	Least Concern
Dermatocarpon luridum	wet rocks	o	-	Least Concern
Dermatocarpon miniatum	coastal rocks	r	-	Least Concern
Gabura fascicularis	epiphytic	r	-	Least Concern
Hypotrachyna revoluta	epiphytic	f	*	Least Concern
Lecidella elaeochroma	epiphytic	o	-	Least Concern
Lepra amara	epiphytic	a	-	Least Concern
Lobaria pulmonaria	epiphytic	f	*	Least Concern
Melanelixia fuliginosa	epiphytic	f	-	Least Concern
Naetrocymbe punctiformis	epiphytic	r	-	Least Concern
Normandina pulchella	epiphytic	f	*	Least Concern
Ochrolechia parella	coastal rocks	o	-	Least Concern
Pannaria conoplea	epiphytic	o	-	Least Concern
Pannaria rubiginosa	epiphytic	r	*	Least Concern
Parmelia saxatilis	epiphytic & on rocks	f	*	Least Concern
Parmeliella thriptophylla	epiphytic	r	*	Least Concern
Parmotrema crinitum	epiphytic	r	*	Least Concern
Pectinia atlantica	epiphytic	o	*	Least Concern
Peltigera collina	banks & among rocks	f	-	Least Concern
Peltigera horizontalis	epiphytic	o	-	Least Concern
Platismatia glauca	epiphytic	o	-	Least Concern
Porpidia sp.	coastal rocks	r	-	Least Concern
Pyrenula macrospora	epiphytic	r	-	Least Concern
Ramalina siliquosa	coastal rocks	lf	-	Least Concern
Sticta sylvatica	epiphytic	f	*	Least Concern
Usnea sp.	epiphytic	f	-	Least Concern
Xanthoria sp.	coastal rocks	la	-	Least Concern
Fungi				

Species	Habitat	Frequency	Lobarion species (*)	Status
Auricularia auricula-judae	epiphytic	r	-	-
Diatrype disciformis	dead wood	r	-	-
Hymenochaete corrugata	dead wood	o	-	-
Leotia lubrica	woodland floor	r	-	-
Rhytisma acerinum	sycamore leaves	la	-	-
Trametes versicolor	deadwood	o	-	-
Hypholoma fasciculare	deadwood	o	-	-
Russula spp.	woodland floor	o	-	-
Mycena sp.	deadwood	o	-	-
Conocybe sp.	woodland floor	f	-	-

Figure 2. *Gabura fascicularis*, with *Sticta sylvatica* on tree

Figure 3. *Parmeliella thriptophylla* on tree

Conclusions

In the context of its geographical location, this site is not particularly rich in vascular plants, bryophytes, lichens, or fungi. One Near Threatened vascular plant was recorded – *Hymenophyllum wilsonii* (Wilson's filmy fern) – although, from a western Scotland viewpoint, it is difficult to see why this species has been given that status, as it is common in damp, shaded habitats. The stand of this plant at the Corran site is anyway essentially temporary, as it is on a dead tree that will not be a permanent feature. Otherwise, the vascular plants are more or less what one would expect in these habitats in this part of Scotland, with the addition of several alien plants that are presumably garden escapes. The profusion of ferns on the woodland floor is notable, but again not particularly unusual. No doubt a number of vascular plant species were missed during the survey, as it was late in the season.

No specially protected, Red List (Callaghan 2022), Nationally Rare or Nationally Scarce (Pescott 2016) bryophytes were recorded.

Fourteen oceanic or hyperoceanic (= Atlantic) bryophytes were recorded:

Liverworts
Frullania teneriffae
Lejeunea lamacerina
Lejeunea patens
Plagiochila bifaria
Radula aquilegia
Saccogyna viticulosa
Scapania gracilis

Mosses
Breutelia chrysocoma
Hyocomium armoricum
Isothecium interludens
Ptychomitrium polyphyllum
Schistidium maritimum
Ulota phyllantha
Zygodon conoideus

This suite of species is not unusual in this part of western Scotland, and it is perhaps notable that none of the small Lejeuneaceae (*Drepanolejeunea*, *Harpalejeunea*, etc) was recorded, even though they are known to occur nearby. Most of the oceanic species listed here are common in the western Highlands. The most notable species is probably *Radula aquilegia*, growing on damp shaded rocks by a seepage towards the southern end of the woodland. While not particularly uncommon in western Scotland, it is one of a suite of species characteristic of humid ravines and streams listed by Averis *et al.* (2012), produced for the assessment of water courses in relation to small-scale hydro schemes. None of the other species listed in this assessment were found at the Corran site.

While a full lichen survey was not done, several large and showy species of the Lobarion community were recorded. This is a widespread community in western Scotland, although historically it was much reduced by atmospheric pollution elsewhere in Britain. It is therefore not strictly oceanic, but the humid and relatively unpolluted conditions in western Scotland have enabled it to survive. No rare or scarce species were seen. The diversity of crustose species, especially on tree bark, is high at this site, but probably not unusually so in this part of Scotland. A full survey would therefore be expected to increase the species list considerably, but it would be surprising if species not found to be widespread elsewhere in woodland on the shores of Loch Linnhe were found. The species of coastal rocks here are similarly typical of the area.

Only a few fungi were recorded and the species identified were considered to be common for the associated habitat types (in particular deadwood and leaflitter). The fungi were surveyed within the optimal season however, many of the fruiting bodies had been partially eaten or were beginning to rot, which hindered identified to species level on some occasions. A full survey would be expected to reveal many more species, but, given the nature of the habitat, it is unlikely that anything particularly rare or significant would be found. *Hymenochaete corrugata* (glue fungus) is a fungus of very restricted distribution, but is locally frequent on the west coast.

Acknowledgements

Thanks are due to Claire Williams of Affric for letting and managing the contract to NGH.

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Corran Ferry Infrastructure Improvement Scheme

Appendix K.7: Arboricultural Impact Assessment and Method Statement

Wallace Stone
Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

ROAVR | GROUP

Project Ref: 24_5837_10_50
Project: Corran Ferry Infrastructure Improvement Scheme
Client: Affric Limited

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Project Number:	24_5837_10_50
Report Type:	Tree Survey, arboricultural impact assessment, and arboricultural method statement
Site Address:	Corran Ferry Infrastructure Improvement Scheme

Role:	Name:	Date:
Instructing Party	Claire Williams (Affric Limited	24/10/2024
Surveyor	Stevie Johnstone	29/10/2024
Consultant	Peter Haine	12/02/2025

Revision History		
Date:	Version number:	Summary of changes:
12/02/2025	1.0	First Review (Internal)
12/02/2025	1.0	First Issue (draft)
18/02/2025	1.0	First Issue (complete)

Arboricultural impact assessment

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2. Site Conditions & Site Surroundings

3. Drawings

4. Tree Quality Statement

5. Arboricultural Impact Assessment

6. Limitations

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Appendix 2 – Arboricultural Data Tables

Appendix 3 – Arboricultural Plans

Validation Statement for the Local Planning Authority.

This report includes the following for LPA validation purposes:

- A **tree survey and tree constraints plan** showing the existing trees, their category rating and above and below ground constraints shown on an OS extract OR a topographical survey
- An **arboricultural impact assessment** which describes how the development will affect local character from a tree perspective
- **Appendices** highlighting tree related information including the **arboricultural data tables**

Customer Action Points.

- ☐ Reporting complete - send to your Local Planning Authority

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1. Introduction & Scope:

This arboricultural assessment has been prepared in accordance with BS5837:2012, providing the necessary information for the Local Planning Authority to assess the potential impact of the proposed development on local character and amenity from a tree perspective.

The brief was to survey the tree population on-site and identify any arboricultural constraints to the proposed development. The assessment includes all trees with a stem diameter greater than 75mm measured at 1.5 metres above ground level, as required by BS5837.

Tree surveys were conducted using ground-based inspections and the Visual Tree Assessment (VTA) method. A sounding hammer was used to assess for decay where relevant, but no invasive techniques were employed at this stage. Root Protection Areas (RPAs) were calculated in line with the methodology set out in BS5837.

Key elements of the report include:

- A Tree Constraints Plan, illustrating the position of trees on the site.
- Arboricultural data tables providing information on tree species, condition, and dimensions.
- Grouping or designation of groups and woodlands where areas were uniform in species, age, or geography, as permitted under BS5837.

This report will assist the planning process by evaluating the impact of the proposed development on the existing tree stock. Section 4 includes the Arboricultural Impact Assessment, which examines constraints posed by trees both above ground (e.g., crown spread) and below ground (e.g., RPAs).

Report Author.

ROAVR (ROAVR Group) was formed in 2010 and since then has carried out arboricultural consultancy Nationwide with directly employed consultants. Our consultants are all individual members of the Arboricultural Association and the report author is listed in the document control sheet.

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Photographic Plates showing typical tree cover across the site

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2. Site Conditions & Site Surroundings

2.1 The site is situated in the western Highlands in the Highland Council control area. The ferry crossing runs across the Narrows, from the settlement of Ardgour to the west, to the settlement of Corran to the east.

2.2 The Corran Ferry runs two vessels across the Narrows, the *MV Corran*, and the *MV Maid of Glencoul*. Existing infrastructure serves these vessels.

2.3 The wider locality is predominantly rural. The eastern site is accessed via the A82, and the western side is accessed by the A861.

2.4 A desktop assessment has highlighted there are no conservation areas or tree preservation orders (TPO) within or adjacent to the Planning Boundary.

2.5 All desktop assessment data was cross checked and validated on the 11/02/2025 using the web portal provided by the local planning authority.

https://highland.maps.arcgis.com/apps/webappviewer/index.html?id=13482108371d4cf288eba4b8a6cacfab

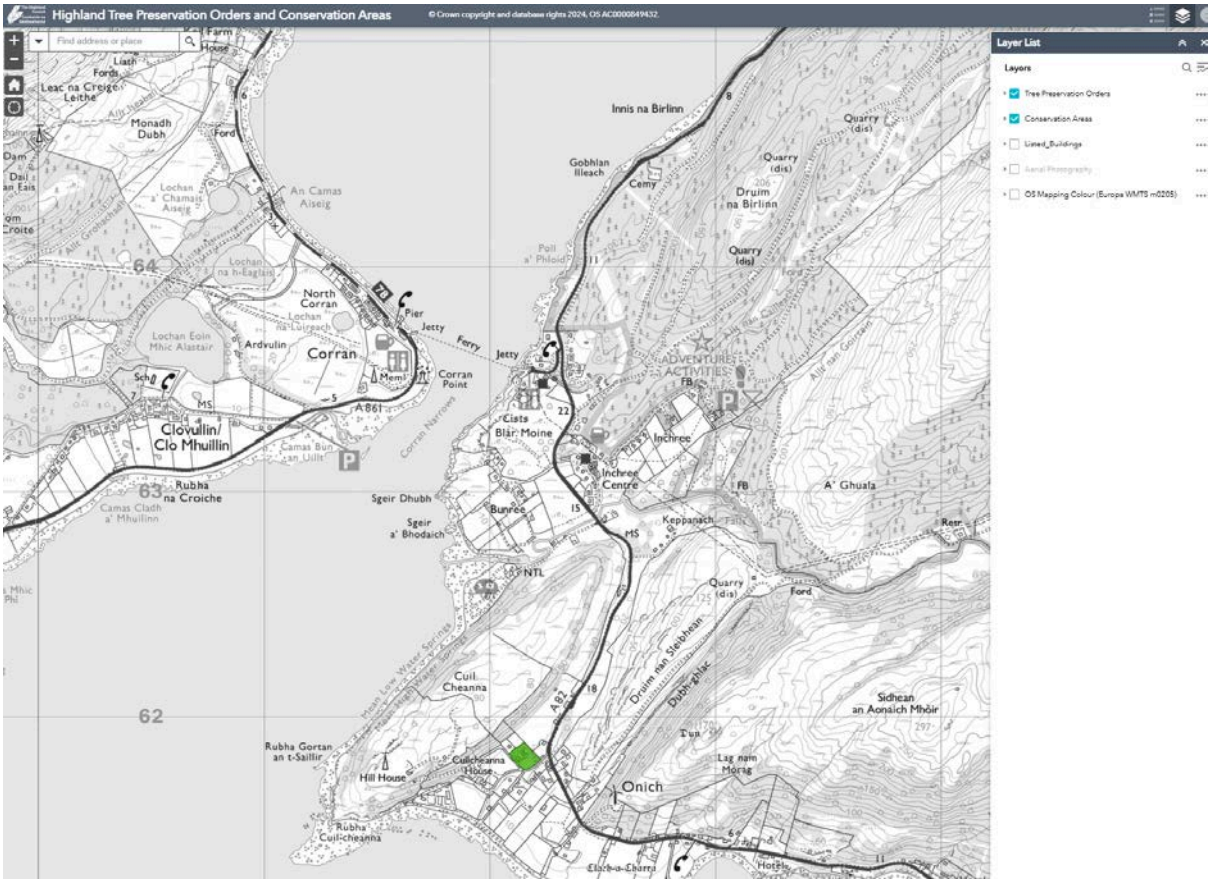

Image plate showing the desktop analysis results of the surveyed plot. (Highland Council, 2025)

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2.6 Works to protected trees require consent from the local planning authority. In the case of TPO's an application must be made. In the case of conservation areas a notification must be made. TPO applications take up to eight weeks, conservation area notifications take six weeks.

2.7 Certain exemptions apply; for example the removal of deadwood. In the case of dangerous trees 5-days written notice should be given to the local authority (in the cases of immediate danger the work should proceed, but the local authority contacted as soon as possible afterwards) with the works evidenced by photographs and video where possible. You should also check to ensure the works are exempt from the requirements of a felling licence.

https://www.legislation.gov.uk/uksi/2012/605/regulation/14/made

2.8 It should be noted that planning consent overrides protected trees, where the works or removal are necessary for development to proceed and have been highlighted in the tree survey documents.

2.9 Bats. Under current legislation it is an offence to 'intentionally or recklessly disturb a bat' or 'damage, destroy or block access to the resting place of any bat'. For further details consultation must be made with the Statutory Nature Conservancy Organisation. Where relevant any current ecological surveys for the site will take precedence in this matter. Trees provide numerous 'potential roosting features' for a wide range of bat species. It is therefore crucial that any trees proposed for removal are checked by an appropriately competent person before any felling or ivy stripping works commence.

https://www.bats.org.uk/advice/bats-and-the-law

2.10 Birds. It is an offence to kill, injure or take any wild bird; or take, damage or destroy the nest of any wild bird while it is in use or being built. Therefore work likely to disturb nesting birds must be avoided from late March to August. All birds, their nest and eggs are protected by law.

https://www.rspb.org.uk/birds-and-wildlife/advice/wildlife-and-the-law/wildlife-and-countryside-act/

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3. Drawings

3.1 Appended to this report is a tree constraints plan and a tree assessment plan.

3.2 The tree constraints plan has been produced using a supplied topographical survey. Tree positions and data have been applied using our survey handset as an onsite exercise with the constraints plan being produced as a PDF through Auto CAD.

3.3 An autoCAD .dwg file of the tree constraints is available on request for project stakeholders to utilise.

3.4 The *Tree Constraints Plan* shows the existing layout. For each tree the stem location is indicated and scaled according to its diameter, the canopy is indicated according to measurements taken along the four cardinal points of the compass. Root protection areas (RPAs) are indicated which are calculated according to the guidelines within BS 5837 (2012).

3.5 Where appropriate, the shapes of the RPAs have been amended to reflect actual site conditions or where trees have been heavily pruned. The 'original' RPAs are indicated as a dashed line whereas the amended RPAs are indicated as a solid line. Any variation to this approach will be highlighted on the appropriate plans.

3.6 The *Tree Assessment Plan / Arboricultural Impact Assessment* indicates the tree constraints with the proposals overlaid. Where applicable, this plan shows where works are proposed in Root Protection Areas and which trees are to be pruned or removed. This plan accompanies the Impact Assessment which is to be found in Section 4.

3.7 The *Tree Protection Plan* shows the protection measures that are to be installed during the construction phase. This plan accompanies an arboricultural method statement where applicable and commissioned.

3.8 The *Tree Removal Plan* shows the trees and tree groups for removal prior to commencement of works. This plan accompanies an arboricultural method statement where applicable and commissioned.

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4. Tree Quality Statement

A tree survey has been conducted in accordance with BS5837:2012 - Trees in Relation to Design, Demolition and Construction – Recommendations. The survey assessed the condition, quality, and retention value of trees within the project area, covering the Ardgour and Nether Lochaber sides of the Narrows.

Tree Categorisation

Trees were categorised based on their condition, life expectancy, and contribution to the landscape:

- Category A (High Quality): No trees in the survey area were assessed as Category A.
- Category B (Moderate Quality): Many trees fall into this category, including groups of Sitka Spruce (Picea sitchensis), European Larch (Larix decidua), Sycamore (Acer pseudoplatanus), and Alder (Alnus glutinosa). These trees are of moderate arboricultural value with an estimated remaining lifespan of at least 20 years.
- Category C (Low Quality/Young Trees): Includes young or structurally poor trees such as Hazel (Corylus avellana), Rowan (Sorbus aucuparia), and Birch (Betula pendula). These trees have lower retention value due to limited lifespan or poor form.
- Category U (Unsuitable for Retention): Trees in poor condition with a life expectancy of fewer than 10 years, including some windblown Sitka Spruce and Ash (Fraxinus excelsior), are recommended for removal.

Tree Condition and Management Recommendations

- The majority of trees surveyed are in good condition, with no immediate defects requiring intervention.
- Some storm-damaged trees and those showing signs of competition within dense groups are noted, but they do not pose significant risk.
- A small number of declining Ash trees were identified, with signs of dieback. These trees may be affected by Ash Dieback Disease (Hymenoscyphus fraxineus) and require monitoring.
- The survey identifies windblown trees that have fallen into neighbouring specimens, but these do not currently impact structural stability.

Impact and Considerations

- Retention and protection of higher-quality trees (Category B) should be prioritised where feasible within the infrastructure development.
- Mitigation planting should be considered for any removed trees, maintaining ecological and landscape value.

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- The Root Protection Areas (RPAs) of retained trees must be safeguarded, ensuring no significant ground disturbance occurs within these zones.
- Construction exclusion zones should be implemented around retained trees in accordance with BS5837:2012 guidelines.

This tree quality statement provides a summary of the arboricultural value of trees surveyed within the project area. It supports decision-making regarding tree retention, removal, and mitigation planting to ensure compliance with best practice and environmental considerations.

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5. Arboricultural Impact Assessment

5.1. Introduction

This Arboricultural Impact Assessment (AIA) evaluates the potential effects of the proposed Corran Ferry Infrastructure Improvement Scheme on existing trees within the development area. It identifies trees for retention and removal, assesses impacts on retained trees, and outlines mitigation and protection measures. The assessment has been prepared in accordance with BS5837:2012 – Trees in Relation to Design, Demolition and Construction – Recommendations.

5.2. Tree Survey Overview

A detailed tree survey was conducted, categorising trees based on their condition, retention value, and impact from the proposed works. The surveyed trees fall into the following categories:

- Category A (High Quality): No trees in this category.
- Category B (Moderate Quality): Includes key specimens such as T51, T56-T68, and G52, which have been prioritised for retention.
- Category C (Low Quality): Includes younger or structurally poor trees with limited landscape or ecological value.
- Category U (Unsuitable for Retention): Trees in declining or hazardous condition, which would not be viable beyond 10 years.

A Tree Constraints Plan (TCP) has been prepared to inform design considerations and tree protection strategies.

5.3. Tree Retention and Protection

5.3.1 Construction Compound Sites

- No trees will be removed from the Nether Lochaber Construction Compound Site or the Ardgour Construction Compound Site.
- All surveyed trees in these areas will be retained and protected throughout the construction period.
- Temporary HERAS fencing will be installed around retained trees to form a Construction Exclusion Zone (CEZ), preventing any site activity within Root Protection Areas (RPAs).

5.3.2 Cable Route Adjustments

- The proposed cable route at the Ardgour Development Site has been revised following arboricultural advice from ROAVR.
- The RPAs of significant trees (T52-T68 and G52) have been fully avoided, ensuring no significant impact.

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- The cable route will clip the RPAs of T60 and T61, where the cable must remain to the north of a retaining wall at the southern end of the North Corran cul-de-sac.
- Hand excavation methods will be used in this area to minimise root disturbance. A detailed method statement for these works is included in the appended Arboricultural Method Statement (AMS).

5.3.3 Access Road Construction

- The proposed access road into the field behind Ardgour will require some excavation within the RPA of T51 and T69, two significant Category B trees.
- The total encroachment for T51 is approximately 10% of its RPA, and around 5% for T69. Measures will be taken to avoid significant root damage.
- A detailed method statement for these works is included in the appended Arboricultural Method Statement (AMS).

5.3.4 Works Close to T10

- The RPA of T10 will be clipped slightly by the proposed access road into the Nether Lochaber Development Site. The area of direct encroachment is around 2.5% of the total root protection area.
- The buffer zone of tree removals extends further into the root protection area of T10, and the tree protection fencing will be set back to allow a working zone.
- As the area of direct encroachment is small, and the ground is relatively flat and level T10 can be retained with the use of ground protection boarding to protect the roots outside of the temporary tree protection fencing.

5.4 Tree Removals

The proposed Corran Ferry Infrastructure Improvement Scheme requires the removal of selected trees to facilitate construction and associated works. A total of 9,292 m² of tree groups and 32 individual stems have been identified for removal, based on their location within the development footprint and their arboricultural value.

Extent of Tree Removals

The removals consist of a mix of individual trees and tree groups, as detailed in the appended Corran Ferry Infrastructure Improvement Scheme Tree Removals Table, and shown on the Tree Removal Plan:

- Tree Groups:
    - Several groups will be partially removed, including G1, G2, G5, G17, G20, G31, and G32.

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    - Several groups will be fully removed, including G23, G25, G26, G28, G110, G116, and G119.
- Individual Trees:
    - A total of 15 individual trees will be removed, including T9, T11, T12, T14, T15, T16, T21, T22, T30, T49, T50, T112, T117, and T118.
    - These trees are primarily moderate (Category B) or low (Category C) quality, with some trees in declining condition.

Justification for Tree Removal

- Trees identified for removal conflict with the proposed infrastructure works, including slipway construction, access roads, and service installations.
- Some tree groups are located within areas requiring significant ground re-profiling, making their retention impractical. A 5 metre buffer zone has been established around sections of the proposals, specifically to the north of the Nether Lochabour Development site to enable works to be carried out without impacting the roots of retained sections of G1, G2, G5, G17, G31, and G33.
- Trees classified as Category C (low quality) or Category U (unsuitable for retention) have been prioritised for removal where possible.

Mitigation Measures

- A replacement planting scheme will be considered to compensate for lost canopy cover and habitat value.

5.5. Mitigation and Replanting Proposals

To offset tree losses and enhance landscape integration, new tree and shrub planting will be implemented.

- The removal of higher-value trees will be minimised where feasible, with root protection measures implemented for retained trees.
- Planting proposals will be coordinated with the ecology and landscape strategy to ensure effective integration.
- A robust replanting strategy will be prepared, with a focus on native species to support local biodiversity.
- Species selection will consider climate resilience, ecological connectivity, and long-term landscape character.
- Tree protection fencing will be installed around retained trees in accordance with BS5837:2012 to prevent damage during construction.

The proposed removals have been carefully assessed to balance infrastructure requirements with arboricultural and ecological considerations.

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5.6. Facilitation Pruning

No pruning works are required to retained trees, and no additional pressure on retained trees for harsh pruning or removal is foreseen.

5.7. Conclusion

The proposed development has been designed to minimise arboricultural impact, with careful planning of infrastructure elements to avoid high-value trees. Where impacts are unavoidable, mitigation measures, hand excavation techniques, and replanting proposals have been incorporated to maintain long-term tree cover and landscape quality.

This assessment should be read alongside the appended Tree Protection Plan (TPP) and Arboricultural Method Statement (AMS), which detail specific protection measures and working methods for retained trees.

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6. Limitations

6.1 ROAVR has prepared this Report for the sole use of the above named Client/Agent in accordance with our terms of business, under which our services were performed. No other warranty, expressed or implied, is made as to the professional advice included in this Report or any other services provided by us.

6.2 This Report may not be relied upon by any other party without the prior and express written agreement of ROAVR. The assessments made assume that the land use will continue for their current purpose without significant change. ROAVR has not independently verified information obtained from third parties.

6.3 This report, video walkthrough, data tables and raw data remain the copyright of ROAVR until such time as any monies owed are settled in full and the report may be withdrawn at any time.

6.4 This report, site visit, plans and conclusions are proportional to the proposals and in some cases a simple plan based impact assessment may be all that is required.

6.5 Important - to ensure fair allocation of resources, we allow you ten working days to review the report and issue any feedback, beyond that changes are chargeable.

6.6 For references and further information regarding tree survey process visit: https://www.roavr-group.co.uk/roavr-group/survey/sp-3-arboriculture/

Should you require any further information, please do not hesitate to contact us at any time.

Mr. Peter Haine FDSc Arb
Consultant Arborist
[Redacted]

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Prepared by: Peter Haine
Checked by: Alexander Barnes

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Appendix 1 – Site Location

Google, 2025

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Appendix 2 – Arboricultural Data Tables

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Tree number	Name	Age	Diameter (mm)	Height (m)	Crown Hgt (m)	North (m)	East (m)	South (m)	West (m)	Condition	Life Exp	Comments-Pick	Recommendations	RPR	Category
G1	Betula pendula (Silver Birch),Alnus incana (Grey Alder),Acer pseudoplatanus (Sycamore), Fraxinus excelsior (Ash)	EM	200	9	2	2	3	2	3	Good	20+	-	No work required	2.4	B2
G2	Larix decidua (European Larch)	M	300	16	6	3	4	3	4	Good	20+	Size range from 200mm to 400mm. Some storm damage.	No work required	3.6	B2
G3	Corylus avellana (Hazel),Betula pendula (Silver Birch)	SM	150	6	2	2	2	2	2	Good	20+	Hazel average size 100mm, Birch average size 200mm	No work required	1.8	B2
T4	Picea sitchensis (Sitka Spruce)	M	700	17	4	4	3	5	6	Good	20+	-	No work required	8.4	B1
G5	Betula pendula (Silver Birch)	SM	150	8	5	2	1	2	3	Good	20+	-	No work required	1.8	B2
T6	Picea sitchensis (Sitka Spruce)	M	410	18	4	5	3	5	5	Good	20+	-	No work required	4.92	B1
T7	Picea sitchensis (Sitka Spruce)	M	530	18	4	5	2	5	5	Good	20+	-	No work required	6.36	B1
T8	Picea sitchensis (Sitka Spruce)	EM	330	13	8	3	3	3	3	Good	20+	-	No work required	3.96	B1
T9	Larix decidua (European Larch)	M	420	17	5	5	7	1	1	Good	20+	Crown distorted due to group pressure.	No work required	5.04	B1
T10	Picea sitchensis (Sitka Spruce)	M	1070	20	5	7	4	6	6	Good	20+	Wind blown tree has fallen into this one.	No work required	12.84	B1
T11	Picea sitchensis (Sitka Spruce)	M	560	18	5	5	3	1	3	Good	20+	-	No work required	6.72	B1
T12	Larix decidua (European Larch)	M	430	17	3	2	4	1	1	Good	20+	-	No work required	5.16	B1
T13	Picea sitchensis (Sitka Spruce)	M	570	18	5	1	3	5	3	Good	20+	-	No work required	6.84	B1
T14	Pinus mugo (Mountain Pine)	M	560	16	4	1	3	4	2	Good	10+	Historically windblown.	No work required	6.72	C1
T15	Betula pendula (Silver Birch)	EM	200	8	5	1	4	1	0.5	Fair	10+	-	No work required	2.4	C1
T16	Picea sitchensis (Sitka Spruce)	M	320	15	3	2	4	1	1	Good	20+	Crown distorted due to group pressure.	No work required	3.84	B1
G17	Betula pendula (Silver Birch),Alnus glutinosa (Common Alder),Sorbus aucuparia (Rowan)	M	200	11	4	3	3	3	3	Good	20+	Mostly Birch and Alder with the odd Rowan.	No work required	2.4	B2
T18	Picea sitchensis (Sitka Spruce)	M	1000	17	5	4	4	4	4	Poor	<10	Wind blown.	No work required	12	U
T19	Picea sitchensis (Sitka Spruce)	M	830	17	5	4	4	4	4	Good	20+	-	No work required	9.96	B1
G20	Alnus glutinosa (Common Alder),Betula pendula (Silver Birch),Corylus avellana (Hazel)	EM	250	8	3	2	2	2	2	Good	20+	-	No work required	3	B2
T21	Picea sitchensis (Sitka Spruce)	M	650	17	3	3	2	2	5	Good	20+	-	No work required	7.8	B1
T22	Picea sitchensis (Sitka Spruce)	M	530	17	3	2	2	2	5	Good	20+	-	No work required	6.36	B1
G23	Alnus glutinosa (Common Alder),Betula pendula (Silver Birch),Picea sitchensis (Sitka Spruce)	M	250	12	4	2	3	3	3	Good	20+	Mostly Birch and Alder. Spacing between trees approx 3m.	No work required	3	B2
G24	Picea sitchensis (Sitka Spruce)	M	300	16	5	3	3	3	3	Good	20+	Approximently 12 trees space 2-3m apart.	No work required	3.6	B2
G25	Corylus avellana (Hazel)	EM	100	5	1	3	3	3	3	Good	20+	-	No work required	1.2	B2
G26	Alnus glutinosa (Common Alder),Betula pendula (Silver Birch)	EM	180	9	4	3	4	3	4	Good	20+	-	No work required	2.16	B2
G27	Fraxinus excelsior (Ash)	M	300	10	4	3	4	3	3	Good	20+	-	No work required	3.6	B2
G28	Alnus glutinosa (Common Alder),Betula pendula (Silver Birch),Picea sitchensis (Sitka Spruce),Corylus avellana (Hazel)	M	200	9	6	3	3	3	3	Good	20+	Mostly Alder space approx 4m apart.	No work required	2.4	B2
G29	Acer pseudoplatanus (Sycamore)	M	500	17	3	6	4	4	7	Good	20+	A tight group of Sycamore.	No work required	6	B2
T30	Fraxinus excelsior (Ash)	M	340	16	8	4	2	4	3	Good	20+	-	No work required	4.08	B1
G31	Alnus glutinosa (Common Alder)	M	300	12	6	3	3	3	3	Good	20+	Approx spacing 5m	No work required	3.6	B2
G32	Corylus avellana (Hazel)	Y	90	4	0.5	2	2	2	2	Good	20+	-	No work required	1.08	B2
G33	Alnus glutinosa (Common Alder),Betula pendula (Silver Birch),Corylus avellana (Hazel)	EM	180	9	5	3	3	3	3	Good	20+	Tight group of Birch and Alder with lots of Rhyidendrum growing in between.	No work required	2.16	B2
G35	Alnus glutinosa (Common Alder),Betula pendula (Silver Birch),Salix fragilis (Crack Willow)	EM	150	9	1	2	3	2	3	Good	20+	A tight group consisting mostly of Birch and Alder.	No work required	1.8	B2
G34	Betula pendula (Silver Birch),Salix fragilis (Crack Willow)	Y	90	6	0.5	2	2	2	2	Good	20+	A tight group of young tree and shrubs.	No work required	1.08	B2
T36	Betula pendula (Silver Birch)	EM	100	6	0.5	2	2	2	2	Good	20+	-	No work required	2.4	B1
T37	Betula pendula (Silver Birch)	EM	200	6	0.5	2	2	2	2	Good	20+	-	No work required	2.4	B1
T38	Picea sitchensis (Sitka Spruce)	Y	90	4	0.5	1.5	1.5	0.5	1.5	Good	20+	-	No work required	1.08	B1

T39	Betula pendula (Silver Birch)	EM	100	6	2	2	2	1	2	Good	20+	-	No work required	1.2	B1
T40	Betula pendula (Silver Birch)	EM	90	6	2	1	1	1	1	Good	20+	Multiple stems at ground level.	No work required	1.87	B1
T41	Fraxinus excelsior (Ash)	EM	200	4	1	1.5	1.5	1.5	1.5	Dead	<10	-	No work required	2.4	U
T42	Sorbus aucuparia (Rowan)	SM	110	4	1	1	1	1	1	Good	10+	Growing on a steep bank	No work required	1.32	C1
T43	Sorbus aucuparia (Rowan)	SM	110	5	2	1	1	1	1	Good	10+	Growing on a steep bank	No work required	1.32	C1
T44	Fraxinus excelsior (Ash)	M	530	12	3	5	6	6	4	Good	20+	-	No work required	6.36	B1
T45	Ilex aquifolium (Holly)	M	200	7	2	4	4	4	5	Good	20+	-	No work required	4.15	B1
T46	Sorbus aucuparia (Rowan)	M	220	5.5	1	3	3	3	3	Good	20+	Growing on a steep bank	No work required	3.73	B1
T47	Sorbus aucuparia (Rowan)	M	250	6.5	2	3	3	3	3	Good	20+	Growing on a steep bank	No work required	3	B1
T48	Crataegus monogyna (Hawthorn)	M	180	5	1	3	3	3	3	Good	20+	-	No work required	2.16	B1
T49	Picea sitchensis (Sitka Spruce)	EM	510	17	2	5	3	6	4	Good	20+	-	No work required	6.12	B1
T50	Abies procera (Noble Fir)	EM	450	16	3	4	4	4	4	Good	20+	Multiple stems above 1.5m.	No work required	5.4	B1
T51	Fagus sylvatica (Beech)	M	440	13	2	3	4	4	4	Good	20+	-	No work required	5.28	B1
G52	Corylus avellana (Hazel)	SM	100	5	2	1	1	1	1	Good	20+	Group of small Hazel	No work required	1.2	B1
T53	Crataegus monogyna (Hawthorn)	EM	90	4	1.5	2	2	2	2	Fair	10+	Decay present on stem.	No work required	1.52	C1
T54	Populus canescens (Grey Poplar)	M	370	18	2	4	1	5	3	Good	20+	Part of linear group. Major bark wounding on stem.	No work required	4.44	B1
T56	Populus canescens (Grey Poplar)	M	500	21	6	5	5	5	2	Good	20+	Part of linear group.	No work required	6	B1
T57	Populus canescens (Grey Poplar)	M	400	19	2	4	3	4	1	Good	20+	Part of linear group. Major bark wounding on stem.	No work required	4.8	B1
T58	Acer pseudoplatanus (Sycamore)	M	280	12	2	5	5	5	5	Good	20+	Stem divides below 1.5m.	No work required	4.75	B1
T59	Cryptomeria japonica (Japanese Red Cedar)	M	580	15	1	4	4	4	4	Good	20+	-	No work required	6.96	B1
T60	Prunus (Prunus species)	SM	240	8	4	4	1	4	2	Fair	10+	Poor shape & form. Unbalanced crown shape.	No work required	2.88	C1
T61	Prunus (Prunus species)	M	430	9	3	4	4	5	4	Good	20+	-	No work required	5.16	B1
T62	Prunus (Prunus species)	M	280	12	3	4	4	5	5	Good	20+	Stem divides below 1.5m.	No work required	4.75	B1
T63	Prunus (Prunus species)	EM	160	6	2	3	3	3	3	Good	20+	-	No work required	1.92	B1
T64	Sorbus aucuparia (Rowan)	EM	240	8	2	2	4	4	3	Good	20+	-	No work required	2.88	B1
T65	Sorbus aucuparia (Rowan)	EM	220	7	2	4	4	1	3	Good	20+	-	No work required	2.64	B1
T66	Sorbus aucuparia (Rowan)	EM	230	10	2	3	3	4	3	Good	20+	-	No work required	2.76	B1
T67	Prunus (Prunus species)	M	350	12	3	5	5	4	5	Good	20+	Decay present on stem. Cavity on stem.	No work required	4.2	C1
T68	Picea sitchensis (Sitka Spruce)	M	460	15	2.5	4	3	2	3	Good	20+	Part of linear group.	No work required	5.52	B1
T69	Picea sitchensis (Sitka Spruce)	M	620	17	2.5	2	3.5	3	3	Good	20+	Part of linear group.	No work required	7.44	B1
T70	Picea sitchensis (Sitka Spruce)	M	370	12	2	3	1.5	1.5	3	Good	20+	Part of linear group.	No work required	4.44	B1
T71	Picea sitchensis (Sitka Spruce)	M	490	15	2	2.5	4.5	4	3	Good	20+	Part of linear group.	No work required	5.88	B1
T72	Picea sitchensis (Sitka Spruce)	SM	160	5	0.5	0	2	2	0.5	Poor	10+	Poor shape & form. Part of linear group. Unbalanced crown shape. Crown distorted due to group pressure.	No work required	1.92	C1
T73	Picea sitchensis (Sitka Spruce)	M	390	15	2	2.5	3	4	3	Good	20+	Part of linear group.	No work required	4.68	B1
T74	Picea sitchensis (Sitka Spruce)	SM	120	4	1	0.5	2	3	2	Fair	10+	Part of linear group. Stunted. Unbalanced crown shape. Crown distorted due to group pressure.	No work required	1.44	B1
T75	Picea sitchensis (Sitka Spruce)	M	390	15	2	2.5	3	4	3	Good	20+	Part of linear group.	No work required	4.68	B1
T76	Picea sitchensis (Sitka Spruce)	SM	230	6	0.5	2.5	1	0.5	2	Good	20+	Part of linear group.	No work required	2.76	B1
T77	Picea sitchensis (Sitka Spruce)	M	510	17	2	3.5	4	1	5	Good	20+	Part of linear group. Crown distorted due to group pressure.	No work required	6.12	B1
T78	Picea sitchensis (Sitka Spruce)	M	530	18	0.5	2	3.5	3	4	Good	20+	Part of linear group. Crown distorted due to group pressure.	No work required	6.36	B1
T79	Picea sitchensis (Sitka Spruce)	EM	340	14	0.5	2	3	4	4	Good	20+	Part of linear group.	No work required	4.08	B1
T80	Picea sitchensis (Sitka Spruce)	SM	240	13	0.5	1.5	1	1	1	Fair	10+	Low vitality. Part of linear group.	No work required	2.88	B1
T81	Picea sitchensis (Sitka Spruce)	M	580	18	0.5	3	3	4	5	Good	20+	Low vitality. Part of linear group.	No work required	6.96	B1
W82	Acer pseudoplatanus (Sycamore),Picea sitchensis (Sitka Spruce),Pinus sylvestris (Scots Pine),Larix decidua (European Larch)	M	500	16	2	4	3	3	4	Good	20+	This woodland consists of mature trees ranging from 250mm to over 500mm dbh. The trees are spaced between 2m - 4m apart.	No work required	6	B2

T83	Betula pendula (Silver Birch)	EM	140	7	2	4	4	1	0.5	Fair	10+	Poor shape & form.	No work required	1.68	C1
T84	Larix decidua (European Larch)	M	580	14	3	4	7	3	5	Good	20+	Ivy on tree.	No work required	6.96	B1
T85	Larix decidua (European Larch)	M	570	15	3	4	7	3	5	Good	20+	-	No work required	6.84	B1
T86	Fraxinus excelsior (Ash)	Y	70	4	2	1	1	1	1	Fair	10+	This group of Ash is growing along the burn .	No work required	0.84	C2
T87	Alnus glutinosa (Common Alder)	Y	70	5	2	0.5	0.5	0.5	1	Fair	10+	-	No work required	0.84	C1
T88	Alnus glutinosa (Common Alder)	SM	90	6	3	1	2	1.5	1.5	Good	20+	-	No work required	1.08	C1
T89	Prunus (Prunus species)	M	460	15	4	5	2	5	5	Good	20+	Ivy on tree. Stem divides above 1.5m.	No work required	5.52	B1
T90	Prunus (Prunus species)	M	350	14	4	1	6	6	2	Good	20+	Ivy on tree.	No work required	4.2	B1
T91	Fraxinus excelsior (Ash)	M	330	12	3	3	0.5	0	5	Poor	10+	Leaning West. Ivy on tree. Cavity on stem.	No work required	3.96	C1
T92	Fraxinus excelsior (Ash)	M	280	12	7	3	0	1	7	Poor	10+	Leaning West. Heavy competition with a large Alder.	No work required	3.36	C1
T93	Alnus glutinosa (Common Alder)	M	440	16	3	4	3	3	5	Fair	10+	Heavy competition with the Ash to it west.	No work required	5.28	C1
T94	Alnus glutinosa (Common Alder)	M	190	9	3	0.5	4	3	1	Fair	10+	-	No work required	2.28	C1
T95	Prunus (Prunus species)	SM	170	10	2	1	1	1.5	1	Fair	10+	Low vitality.	No work required	2.04	C1
T96	Ilex aquifolium (Holly)	SM	90	5	2	1.5	1.5	2	1.5	Good	20+	-	No work required	1.08	B1
T97	Corylus avellana (Hazel)	EM	80	5	1	1.5	1.5	2	1.5	Good	20+	-	No work required	0.96	B2
T98	Fraxinus excelsior (Ash)	Y	80	7	0.5	1.5	1.5	1.5	1.5	Fair	10+	Poor location.	No work required	0.96	C1
T99	Corylus avellana (Hazel)	M	170	8	2	3	3	4	3.5	Good	20+	-	No work required	3.53	B1
T100	Prunus avium (Wild Cherry)	M	170	7	2	3	4	1	3	Good	20+	-	No work required	2.04	B1
T101	Alnus glutinosa (Common Alder)	Y	70	5	2	0.5	0.5	0.5	1	Fair	10+	-	No work required	0.84	C1
T102	Corylus avellana (Hazel)	EM	140	5	2	1	2	1.5	1	Good	20+	-	No work required	1.68	B1
T103	Fraxinus excelsior (Ash)	SM	90	5	3	2	1	0.5	1	Poor	<10	Low vitality. Declining.	No work required	1.52	C1
T104	Corylus avellana (Hazel)	Y	70	5	3	3	2	0	0	Fair	10+	Poor shape & form.	No work required	0.84	C1
T105	Alnus glutinosa (Common Alder)	EM	150	9	2	2	4	1	1	Good	20+	-	No work required	1.8	B1
T106	Fraxinus excelsior (Ash)	M	400	14	5	2	7	5	3	Good	20+	-	No work required	4.8	B1
T107	Corylus avellana (Hazel)	EM	90	5	2.5	1	2	1.5	0	Good	20+	-	No work required	1.52	C1
T108	Corylus avellana (Hazel)	EM	90	5	2	2	2	2	2	Good	20+	-	No work required	2.41	C1
G109	Corylus avellana (Hazel),Betula pendula (Silver Birch),Fraxinus excelsior (Ash),Acer pseudoplatanus (Sycamore),Salix caprea (Goat Willow)	Y	100	5	1	2	2	2	2	Good	20+	-	No work required	1.2	B1
G110	Acer pseudoplatanus (Sycamore),Betula pendula (Silver Birch),Alnus glutinosa (Common Alder),Prunus avium (Wild Cherry)	Y	150	4	1	2	2	2	2	Good	20+	-	No work required	1.8	B2
T111	Alnus glutinosa (Common Alder)	EM	100	5	2	2	2	2	2	Good	20+	-	No work required	1.2	B1
T112	Alnus glutinosa (Common Alder)	Y	70	5	2	1.5	1.5	2	1.5	Good	20+	-	No work required	0.84	B1
T113	Fraxinus excelsior (Ash)	SM	210	9	3	1	1	1	1	Poor	<10	Low vitality. Declining.	No work required	2.52	C1
T114	Fraxinus excelsior (Ash)	SM	160	9	3	1	1	1	1	Poor	<10	Low vitality. Declining. Ivy on tree.	No work required	1.92	C1
T115	Fraxinus excelsior (Ash)	OM	1240	13	4	3	5	7	5	Fair	10+	Ivy on tree.	Sever Ivy.	14.88	C1
G116	Corylus avellana (Hazel),Ilex aquifolium (Holly),Prunus avium (Wild Cherry)	SM	90	6	1.5	2	2	2	2	Good	20+	-	No work required	1.08	B2
T117	Prunus avium (Wild Cherry)	M	130	9	2	2	2	3	2.5	Good	20+	-	No work required	2.21	B1
T118	Prunus avium (Wild Cherry)	M	130	9	2	2	2	2	2	Good	20+	-	No work required	2.21	B1
G119	Prunus avium (Wild Cherry),Corylus avellana (Hazel)	EM	100	4	0.5	1.5	1.5	1.5	1.5	Good	20+	-	No work required	1.2	B2

Key to Arboricultural Data Tables

Tree Number	Reference no. T1, T2 etc. for trees; H for hedgerows; G for Groups and W for woodlands.
Species	Tree species Fagus sylvatica; Quercus robur - Latin names.
Age Class	The estimated age class of the tree (relative to species) Y - Young SM - Semi-mature EM - Early-mature M - Mature OM - Over-mature or V - Veteran
Height (Crown Height)	Height of the tree in metres. (Height of the crown above ground level in metres)
Number of Stems	Number of clear stems above 1.5 metres
Diameter at Breast Height	Diameter of stem (mm) at breast height (1.5 metres above ground).
Crown Spread (N, S, E, W)	The maximum spread of the tree's canopy measured from the stem in four directions (North, East, South, West).
Life Expectancy	Estimated safe, usable life expectancy.
Physical Description	Details of tree type, quality, location etc
Comments	Any comments or remarks recorded by the surveyor
Management Recommendations	Recommendations (regardless of the development proposals if available) for removal, retention and/or remedial arboricultural works.
RPA offset from stem	Radius of the root protection area measured in metres
Category Rating	Tree categorisation based on section 4.5 of BS 5837 (2012) Trees in relation to design, demolition and construction – Recommendations: A – Trees of high quality with an estimated remaining life expectancy of at least 40 years. B – Trees of moderate quality with an estimated remaining life expectancy of at least 20 years. C – Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm U – Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years Subcategories: 1: Mainly arboricultural & aesthetic qualities 2: Mainly landscape qualities 3: Mainly cultural values, including conservation

Appendix 3 – Arboricultural Plans

The Tree Constraints Plan and Tree Assessment Plan is shown over four sheets, these form separate pdf documents due to their size.

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Key

Trees
Showing Canopy extents, category colour and tag number (with category).

Category A
Trees of high quality with an estimated remaining life expectancy of at least 40 years.

Category B
Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

Category C
Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.

Category U
Trees in such a condition that they can not realistically be retained as living trees in the context of the current land use for longer than 10 years.

BS 5837:2012 Root Protection Area

ROAVR | GROUP ROAVR Group, Marr House Beechwood Business Park, Inverness, IV2 3BW www.roavr-group.co.uk support@roavr-group.co.uk 01463 667302	Drawing Title **Tree Constraint Plan** **Ardgour side of the narrows North**	Scale/Sheet 1:400 @ A0	Date 12/02/2025		
	Client Affric Ltd	Drawing No 24_5837_10_50	Rev 3	Drawn By PH	Chked By MH
	Site/Project Corran Ferry Infrastructure, Improvement Scheme	**General Notes** Do not scale off drawing - refer to the tree data schedule for accurate crown spread measurements. Depictions of tree canopies are based on measurements taken to four cardinal compass points. No liability of any kind is accepted for any omissions or inaccuracies in respect of this plan. The original of this drawing was produced in colour; a monochrome copy should not be relied upon. All rights reserved.			

N

1:400
0 5 10m

General Notes
Do not scale off drawing - refer to the tree data schedule for accurate crown spread measurements.
Depictions of tree canopies are based on measurements taken to four cardinal compass points.
No liability of any kind Is accepted for any omissions or inaccuracies in respect of this plan.
The original of this drawing was produced in colour; a monochrome copy should not be relied upon.
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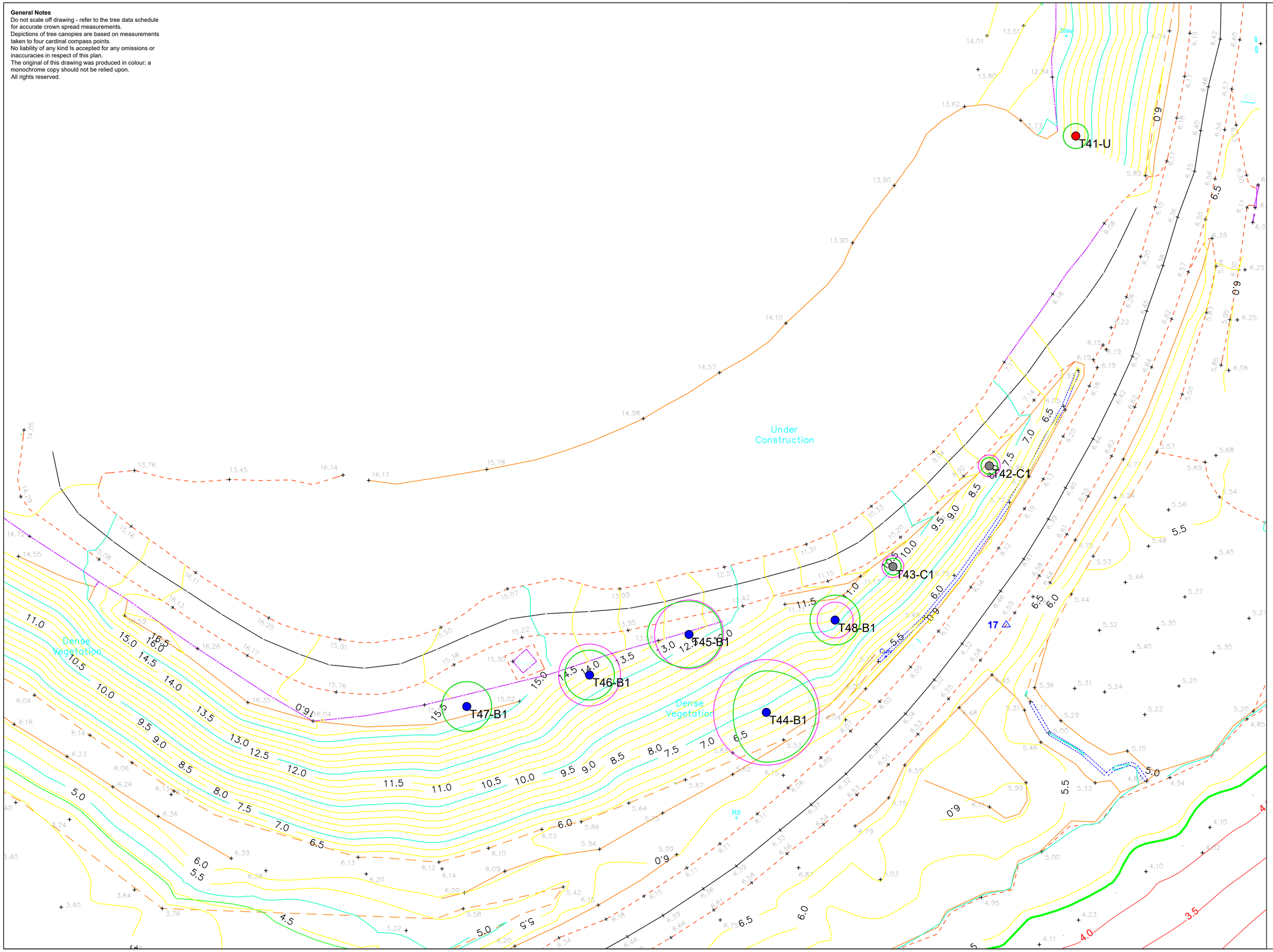

Key

- **Trees** — Showing Canopy extents, category colour and tag number (with category). (T1-B)
- **Category A** — Trees of high quality with an estimated remaining life expectancy of at least 40 years.
- **Category B** — Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
- **Category C** — Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.
- **Category U** — Trees in such a condition that they can not realistically be retained as living trees in the context of the current land use for longer than 10 years.
- **BS 5837:2012 Root Protection Area**

N

1:300
0 5 10m

Drawing Title	**Tree Constraint Plan Ardgour side of the narrows South**
Client	Affric Ltd
Site/Project	Corran Ferry Infrastructure, Improvement Scheme
Scale/Sheet	1:300 @ A2
Date	12/02/2025
Drawing No	24_5837_10_50
Rev	3
Drawn By	PH
Chked By	MH

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Key

Trees
Showing Canopy extents, category colour and tag number (with category).

T1-B

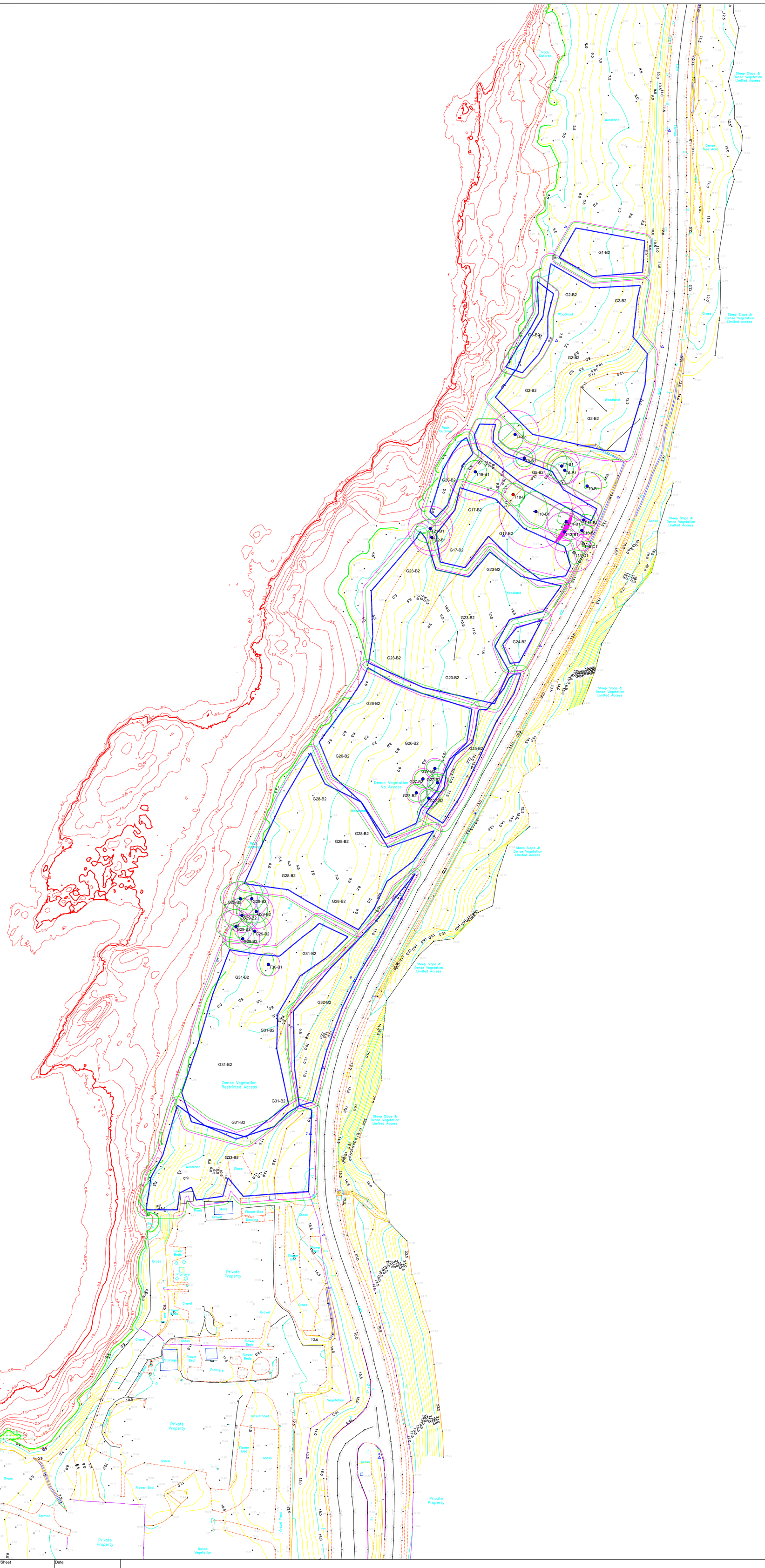
Category A
Trees of high quality with an estimated remaining life expectancy of at least 40 years.

Category B
Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

Category C
Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.

Category U
Trees in such a condition that they can not realistically be retained as living trees in the context of the current land use for longer than 10 years.

BS 5837:2012 Root Protection Area



Drawing Title: **Tree Constraint Plan** **Nether Lochabor side of the Narrows North**		Scale/Sheet: 1:500 @ A0	Date: 12/02/2025		
Client: Affric Ltd		Drawing No: 24_5837_10_50	Rev: 3	Drawn By: PH	Chked By: MH
Site/Project: Corran Ferry Infrastructure, Improvement Scheme					

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01463 667302

General Notes
Do not scale off drawing - refer to the tree data schedule for accurate crown spread measurements.
Depictions of tree canopies are based on measurements taken to four cardinal compass points.
No liability of any kind is accepted for any omissions or inaccuracies in respect of this plan.
The original of this drawing was produced in colour; a monochrome copy should not be relied upon.
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N

1:500
0 10 20m

Key

Trees
Showing Canopy extents, category colour and tag number (with category).

T1-B

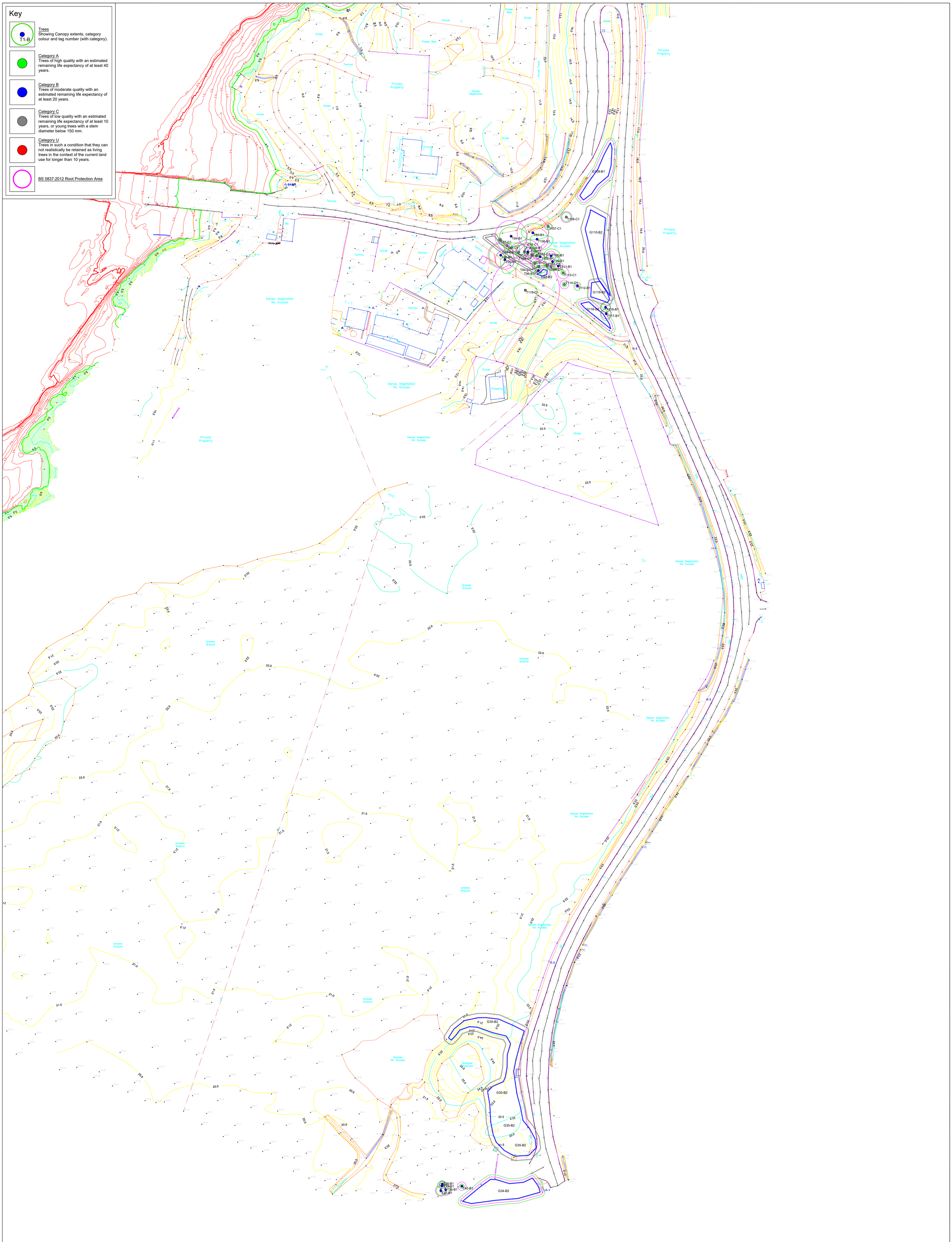
Category A
Trees of high quality with an estimated remaining life expectancy of at least 40 years.

Category B
Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

Category C
Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.

Category U
Trees in such a condition that they can not realistically be retained as living trees in the context of the current land use for longer than 10 years.

BS 5837:2012 Root Protection Area



ROAVR | GROUP ROAVR Group, Marr House Beechwood Business Park, Inverness, IV2 3BW www.roavr-group.co.uk support@roavr-group.co.uk 01463 667302	Drawing Title **Tree Constraint Plan** **Nether Lochabor side of the Narrows South**	Scale/Sheet 1:500 @ A0	Date 12/02/2025		
	Client Affric Ltd	Drawing No 24_5837_10_50	Rev 3	Drawn By PH	Chked By MH
	Site/Project Corran Ferry Infrastructure, Improvement Scheme	**General Notes** Do not scale off drawing - refer to the tree data schedule for accurate crown spread measurements. Depictions of tree canopies are based on measurements taken to four cardinal compass points. No liability of any kind is accepted for any omissions or inaccuracies in respect of this plan. The original of this drawing was produced in colour; a monochrome copy should not be relied upon. All rights reserved.			

N

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0 10 20m

Key

Trees
Showing Canopy extents, category colour and tag number (with category).

T1-B

Category A
Trees of high quality with an estimated remaining life expectancy of at least 40 years.

Category B
Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

Category C
Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.

Category U
Trees in such a condition that they can not realistically be retained as living trees in the context of the current land use for longer than 10 years.

BS 5837:2012 Root Protection Area

Proposed Infrastructure

Proposed Cable Route

Proposed Access Road
RPA Encroachment

W82-B2

ROAVR | GROUP ROAVR Group, Marr House Beechwood Business Park, Inverness, IV2 3BW www.roavr-group.co.uk support@roavr-group.co.uk 01463 667302	Drawing Title **Tree Assessment Plan** **Ardgour side of the narrows North**	Scale/Sheet 1:400 @ A0	Date 13/02/2025		
	Client Affric Ltd	Drawing No 24_5837_10_50	Rev 2	Drawn By PH	Chked By MH
	Site/Project Corran Ferry Infrastructure, Improvement Scheme	**General Notes** Do not scale off drawing - refer to the tree data schedule for accurate crown spread measurements. Depictions of tree canopies are based on measurements taken to four cardinal compass points. No liability of any kind is accepted for any omissions or inaccuracies in respect of this plan. The original of this drawing was produced in colour; a monochrome copy should not be relied upon. All rights reserved.			

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Ardgour Construction Compound Site

Under Construction

Dense Vegetation

Dense Vegetation

T41-U

T42-C1

T43-C1

T44-B1

T45-B1

T46-B1

T47-B1

T48-B1

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BS 5837:2012 Root Protection Area

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Drawing Title	**Tree Assessment Plan Ardgour side of the narrows South**
Client	Affric Ltd
Site/Project	Corran Ferry Infrastructure, Improvement Scheme
Scale/Sheet	1:300 @ A2
Date	13/02/2025
Drawing No	24_5837_10_50
Rev	2
Drawn By	PH
Chked By	MH

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BS 5837:2012 Root Protection Area

Proposed Infrastructure

Proposed Access Road
RPA Encroachment

Proposed Infrastructure

Proposed Infrastructure

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Drawing Title: **Tree Assessment Plan Nether Lochabor side of the Narrows North**	Scale/Sheet: 1:500 @ A0	Date: 13/02/2025		
Client: Affric Ltd	Drawing No: 24_5837_10_50	Rev: 2	Drawn By: PH	Chked By: MH
Site/Project: Corran Ferry Infrastructure, Improvement Scheme				

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BS 5837:2012 Root Protection Area

Proposed Infrastructure

Nether Lochaber Construction Compound Site

Drawing Title: **Tree Assessment Plan Nether Lochabor side of the Narrows South**	Scale/Sheet: 1:500 @ A0	Date: 13/02/2025	
Client: Affric Ltd	Drawing No: 24_5837_10_50	Rev: 2	Drawn By: PH / Chked By: MH
Site/Project: Corran Ferry Infrastructure, Improvement Scheme			

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Arboricultural method statement

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Appendix 1 – Tree Protection Plan

Validation Statement for the Local Planning Authority.

This report includes the following for LPA validation purposes:

- An **arboricultural method statement** which specifies tree protection measures and implementation strategy
- **Appendices** including the **tree protection plan** and **tree removal plan**

1. Introduction

This Arboricultural Method Statement (AMS) provides a framework for tree protection and site management during the Corran Ferry Infrastructure Improvement Scheme. It outlines protection measures, working methods for excavation within Root Protection Areas (RPAs), and a schedule for supervision and monitoring. This document must be adhered to by all contractors working on site.

2. Definition of Terms

2.1 Root Protection Area (RPA)

A theoretical area of ground around a tree where roots are likely to proliferate. Ground disturbance in this area should be minimised to avoid significant impact on tree health. RPAs are indicated on all plans accompanying this report as a magenta line.

2.2 Construction Exclusion Zone (CEZ)

These zones protect roots and canopies from inadvertent damage by construction activity. They are fenced off with protective barriers throughout the construction phase. No works are permitted within these zones, except minor landscaping that does not require a change in ground level. Where practicable, the entire RPA and the area beneath the tree canopy shall be treated as a CEZ. These zones are shown on the Tree Protection Plan (TPP).

2.3 Restricted Activity Zone (RAZ)

Where a full Construction Exclusion Zone is not feasible, a Restricted Activity Zone (RAZ) is created. In these areas, limitations are placed on construction activity, and ground protection measures may be required. Fencing may be installed to restrict access for part of the construction phase. These zones are identified on the Tree Protection Plan (TPP).

3. Tree Protection Measures

3.1 Tree Protection Barriers - Overview

The Tree Protection Plan (TPP) indicates the location of all tree protection barriers.

- Barriers shall be installed before any construction activity, including soil stripping and material deliveries.
- The barriers must remain in place for the duration of construction, except where phased removal is required.
- The Tree Protection Plan also shows areas requiring ground protection measures.

3.2 Tree Protection Fencing

- Specification: Tree protection fencing will be installed in accordance with BS5837:2012 fig. 2.
- Type: Heras panels (2 m high) on vertical steel poles, secured with metal couplers and stabilised with ground pins and braces.
- Location: Fencing will be erected at the edge of RPAs and CEZs as shown on the Tree Protection Plan.
- Signage: “Tree Protection Area – No Access” signs will be fixed to fencing at 10 m intervals.
- Maintenance: Fencing will be inspected weekly and repaired immediately if disturbed.

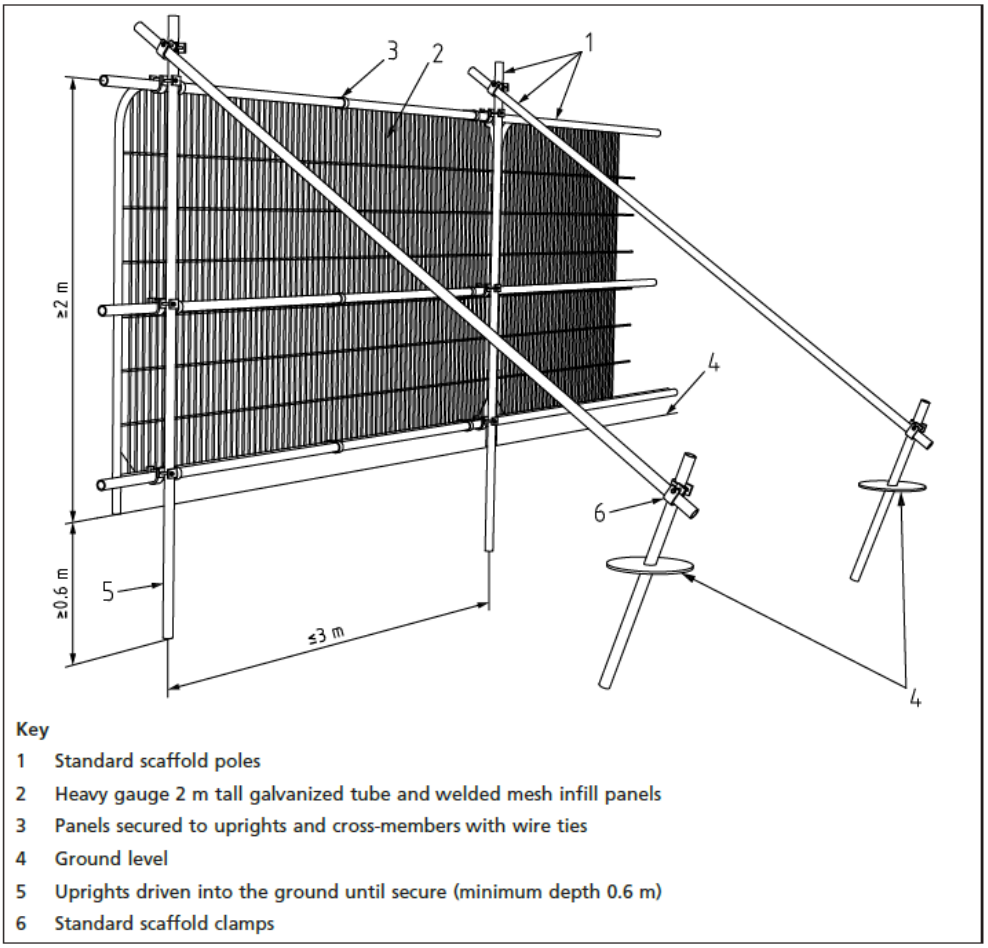
3.3 Ground Protection

Where access or construction occurs within an RPA, ground protection measures will be installed.

- Specification:
    - 20 mm thick synthetic ground protection boards laid over a 100 mm layer of woodchip mulch.
    - Boards will be butted together and secured to prevent movement.
- Use Limitations: Only light plant, pedestrian access, and hand tools are permitted on protected surfaces.

Image plate showing signage for tree protection fencing

Figure 2 Default specification for protective barrier



Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Image plate showing tree protection fencing specification

Image plate showing ground protection boarding

4. Method Statement for Works Within RPAs

4.1 Hand Excavation of Service Trenches – T60 & T61

- Location: Service trench affecting RPAs of T60 & T61, at the southern end of North Corran cul-de-sac.
- Extent of Impact: The trench will clip the RPAs, requiring careful excavation.

Working Method:

1. Pre-Excavation:
    - Tree protection fencing installed before excavation.
    - An arboricultural consultant will supervise initial excavation.
2. Excavation:
    - Hand tools only (spades and forks) will be used for excavation.
    - No mechanical digging is permitted within the RPA area.
    - Where roots over 25 mm diameter are encountered, work will stop and an arboricultural consultant will assess whether retention is possible.
3. Root Pruning:
    - Roots below 25 mm diameter may be pruned with sharp secateurs.
    - Roots over 25 mm diameter will be retained where possible, with trench alignment adjusted as required.
4. Root Protection:
    - Damp hessian will be placed over exposed roots to prevent desiccation.
    - Any necessary root pruning will be done with sharp, sterilised tools.
5. Backfilling:
    - The trench will be backfilled with sand or clean topsoil immediately after works are complete.

4.2 Hand Excavation for Access Road – T51 & T69

- Location: Proposed access road into the field behind Ardgour, affecting the RPA of T51 & T69 (Category B).
- Extent of Impact: Approx. 10% of the RPA for T51 and approx. 5% of the RPA for T69

Working Method:

1. Pre-Excavation:
    - Tree protection fencing installed around the working area.
    - Excavation will be supervised by an arboricultural consultant.
2. Excavation:
    - Hand tools only (spades and trowels) will be used.
    - Soil will be removed in layers to avoid damaging roots.

    - Where major roots (>25 mm) are encountered, work will stop, and an arboricultural consultant will determine if they can be retained.
3. Root Protection & Pruning:
    - Damp hessian will be applied to exposed roots.
    - Pruning will be limited to small roots only (<25 mm diameter).
    - Any necessary root cuts will be made with sharp, sterile pruning saws or secateurs.
4. Backfilling:
    - The excavated area will be backfilled with porous, compacted aggregate rather than traditional sub-base materials.

4.3 Hand Excavation for Access Road – T10

- Location: New access road requiring excavation within the RPA of T10.
- Extent of Impact: Minor RPA incursion requiring localised root protection.

Working Method:

1. Pre-Excavation:
    - Protective fencing will be installed.
2. Excavation:
    - Excavation will be by hand.
    - Small roots under 25 mm may be pruned cleanly.
    - Major roots over 25 mm will be protected with temporary wrapping (damp hessian).

5. Schedule of Supervision and Monitoring

To ensure compliance, an arboricultural consultant will supervise all works within RPAs and conduct regular monitoring throughout the project.

Phase	Action	Supervised By	Frequency
Pre-construction	Precommencement meeting to review tree protection measures and method statements	Site Manager & Arboricultural Consultant	One-off
Pre-construction	Mark up trees for removal	Site Manager & Arboricultural Consultant	One-off
Pre-construction	Install tree protection fencing	Site Manager	One-off
Pre-construction	Install ground protection	Site Manager	One-off
Pre-construction	Sign off tree protection measures	Arboricultural Consultant	One-off
Excavation Phase	Hand excavation in RPA areas	Arboricultural Consultant	Ongoing
Excavation Phase	Root pruning & treatment	Arboricultural Consultant	Ongoing
Excavation Phase	Backfilling & reinstatement	Site Manager	One-off
Construction Phase	Routine tree protection inspections	Arboricultural Consultant	Monthly
Construction Phase	Breaches of tree protection and damage to trees	Site Manager to report to Arboricultural Consultant	As required
Post-Construction	Removal of tree protection fencing & final assessment	Arboricultural Consultant	One-off

All findings will be recorded, and any deviations from the method statement will be reported immediately to the project manager. Any breaches to tree protection or damage to retained trees must be reported to the local planning authority within 48 hours.

6. Tree Removals

Tree removals - to be completed prior to the erection of tree protection fencing.

Tree Removal Table					
Tree/Group Number	**Type**	**total (m2 or stems)**	**all/part to be removed**	**Area to be removed m2**	**Stems to be removed**
G1	group (area)	370	Part (shown on tpp)	156	n/a
G2	group (area)	2271	Part (shown on tpp)	753	n/a
G5	group (area)	320	Part (shown on tpp)	55	n/a
T9	individual tree	1 stem	all	n/a	1
T11	individual tree	1 stem	all	n/a	1
T12	individual tree	1 stem	all	n/a	1
T12	individual tree	1 stem	all	n/a	1
T14	individual tree	1 stem	all	n/a	1
T15	individual tree	1 stem	all	n/a	1
T16	individual tree	1 stem	all	n/a	1
G17	group (area)	737	Part (shown on tpp)	632	n/a
G20	group (area)	147	Part (shown on tpp)	37	n/a
T21	individual tree	1 stem	all	n/a	1
T22	individual tree	1 stem	all	n/a	1
G23	group (area)	2254	all	2254	n/a
G25	group (area)	348	all	348	n/a
G26	group (area)	1832	all	1832	n/a
G27	group (stems)	5 stems	all	n/a	5
G28	group (area)	1812	all	1812	-
G29	group (stems)	7 stems	all	n/a	7
T30	individual tree	1 stem	all	n/a	1
G31	group (area)	1972	Part (shown on tpp)	1038	n/a
G32	group (area)	723	Part (shown on tpp)	255	n/a
T49	individual tree	1 stem	all	n/a	1
T50	individual tree	1 stem	all	n/a	1
G52	group (stems)	6 stems	all	n/a	6
T112	individual tree	1 stem	all	n/a	1
G110	group (area)	187	all	187	n/a
G116	group (area)	49	all	49	n/a
T117	individual tree	1 stem	all	n/a	1
T118	individual tree	1 stem	all	n/a	1
G119	group (area)	40	all	40	n/a

7. Limitations

7.1 ROAVR has prepared this Report for the sole use of the above named Client/Agent in accordance with our terms of business, under which our services were performed. No other warranty, expressed or implied, is made as to the professional advice included in this Report or any other services provided by us.

7.2 This Report may not be relied upon by any other party without the prior and express written agreement of ROAVR. The assessments made assume that the land use will continue for their current purpose without significant change. ROAVR has not independently verified information obtained from third parties.

7.3 This report, video walkthrough, data tables and raw data remain the copyright of ROAVR until such time as any monies owed are settled in full and the report may be withdrawn at any time.

7.4 This report, site visit, plans and conclusions are proportional to the proposals and in some cases a simple plan based impact assessment may be all that is required.

7.5 Important - to ensure fair allocation of resources, we allow you ten working days to review the report and issue any feedback, beyond that changes are chargeable.

7.6 For references and further information regarding tree survey process visit: https://www.roavr-group.co.uk/roavr-group/survey/sp-3-arboriculture/

Should you require any further information, please do not hesitate to contact us at any time.

Mr. Peter Haine FDSc Arb
Consultant Arborist
[Redacted]

ROAVR | GROUP

Prepared by: Peter Haine
Checked by: Alexander Barnes

Appendix 1 – Tree Protection Plan & Tree Removal Plan

The Tree Protection Plan and Tree Removal Plan is shown over four sheets, these form separate pdf documents due to their size.

Key

Trees
Showing Canopy extents, category colour and tag number (with category).
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BS 5837:2012 Root Protection Area

Tree Protective Fencing

Ground Protection/ Restricted Activity Zone

CEZ — Construction Exclusion Zone

CEZ

CEZ

CEZ

CEZ

Ground Protection Boarding Required

Supervised Hand Dig Access Road

Drawing Title: **Tree Protection Plan** **Nether Lochabor side of the Narrows North**	Scale/Sheet: 1:500 @ A0	Date: 18/02/2025		
Client: Affric Ltd	Drawing No: 24_5837_10_50	Rev: 1	Drawn By: PH	Chked By: MH
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Supervised Hand Dig
Utility Trench

Supervised Hand Dig
Access Road

CEZ 5.2m

CEZ 5.3m

CEZ 5.5m 7.4m

CEZ 6.4m 7.0m

CEZ W82-B2 5.3m 5.0m

ROAVR | GROUP ROAVR Group, Marr House Beechwood Business Park, Inverness, IV2 3BW www.roavr-group.co.uk support@roavr-group.co.uk 01463 667302	Drawing Title **Tree Protection Plan** **Ardgour side of the narrows North**	Scale/Sheet 1:400 @ A0	Date 25/02/2025		
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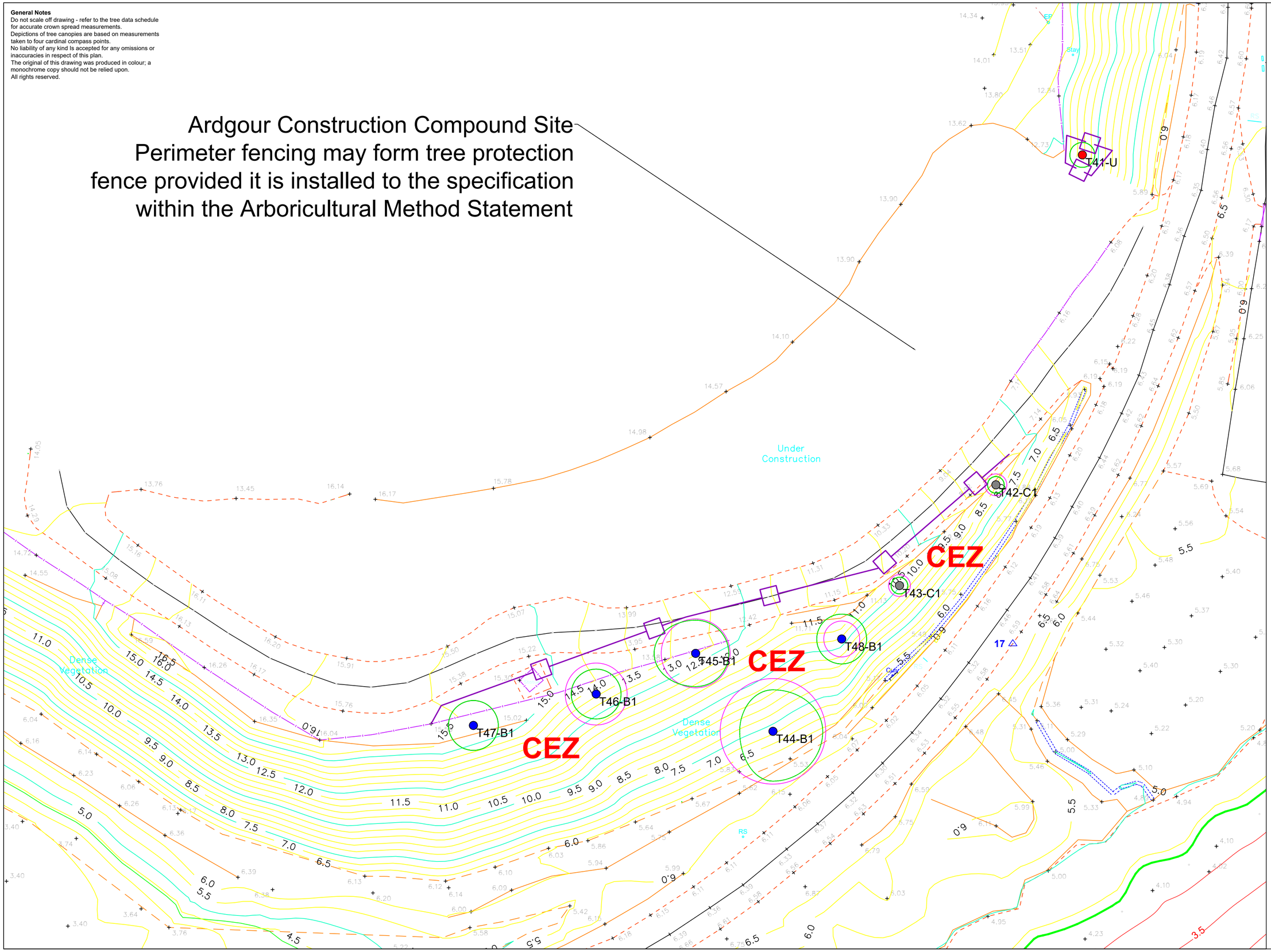
Ardgour Construction Compound Site
Perimeter fencing may form tree protection fence provided it is installed to the specification within the Arboricultural Method Statement



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BS 5837:2012 Root Protection Area

Tree Protective Fencing

CEZ — Construction Exclusion Zone

Nether Lochaber Construction Compound Site Perimeter fencing may form tree protection fence provided it is installed to the specification within the Arboricultural Method Statement

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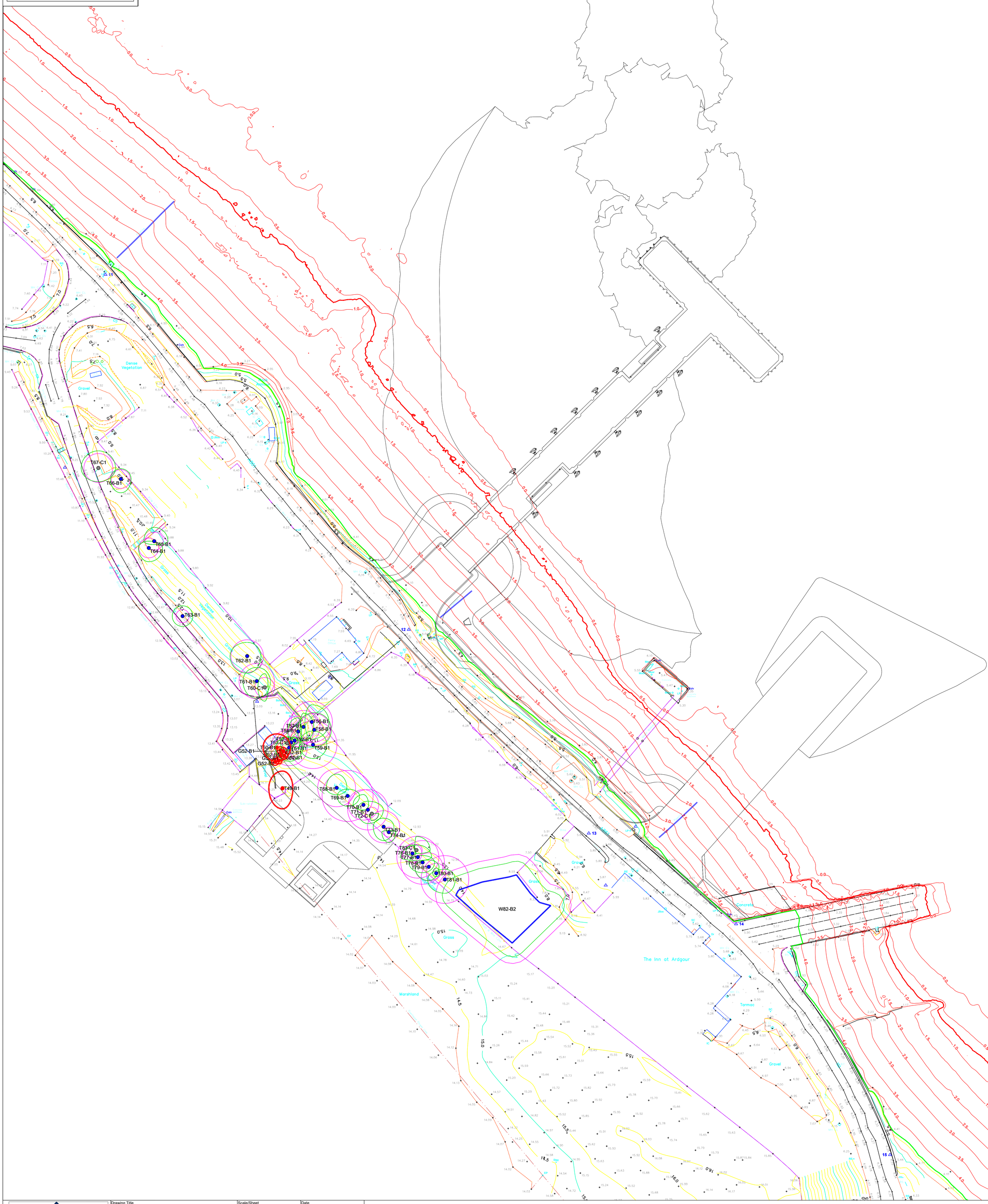
BS 5837:2012 Root Protection Area

Trees for Removal

Tree Groups for Removal


T67-C1
T66-B1
T65-B1
T64-B1
T63-B1
T62-B1
T61-B1
T60-C1
T56-B1
T57-B1
T54-B1
T58-B1
T52-B1
T53-C1
T55-B1
T50-C1
T61-B1
T59-B1
G52-B1
T49-B1
T68-B1
T69-B1
T76-B1
T71-B1
T72-C1
T73-B1
T74-B1
T83-C
T75-B1
T77-B1
T78-B1
T79-B1
T80-B1
T81-B1
W82-B2
T1-B
T2-B
T3-B
T4-B
T5-B
T6-B
T7-B
T8-B
T9-B
T10-B
T11-B
T12-B
T13-B
T14-B
T15-B
T16-B
T17-B
T18-B
T19-B
T20-B
T21-B
T22-B
T23-B
T24-B
T25-B
T26-B
T27-B
T28-B
T29-B
T30-B
T31-B
T32-B
T33-B
T34-B
T35-B
T36-B
T37-B
T38-B
T39-B
T40-B
T41-B
T42-B
T43-B
T44-B
T45-B
T46-B
T47-B
T48-B
Dense Vegetation
Gravel
Grass
Marshland
Concrete
Tarmac
The Inn at Ardgour
Fence
Wall
Building
Slipway
Pier
Jetty
Sub-station
Ferry Office
Toilets
Waiting Room
Ticket Office
Store
Bus Shelter
Bollard
Flagpole
Lamp Post
Manhole
Gully
Catch Pit
Inspection Chamber
Soil Vent Pipe
Water Valve
Gas Valve
Electric Box
Telecom Box
Cable Box
Post Box
Bench
Sign
Hedge
Tree
Edge of Water
Mean High Water Springs
Mean Low Water Springs
Top of Bank
Foot of Bank
Edge of Path
Edge of Road
Edge of Concrete
Edge of Gravel
Edge of Grass
Edge of Tarmac
Edge of Hedge
Edge of Tree
Edge of Building
Edge of Wall
Edge of Fence
Edge of Pier
Edge of Jetty
Edge of Slipway
Edge of Sub-station
Edge of Ferry Office
Edge of Toilets
Edge of Waiting Room
Edge of Ticket Office
Edge of Store
Edge of Bus Shelter
Edge of Bollard
Edge of Flagpole
Edge of Lamp Post
Edge of Manhole
Edge of Gully
Edge of Catch Pit
Edge of Inspection Chamber
Edge of Soil Vent Pipe
Edge of Water Valve
Edge of Gas Valve
Edge of Electric Box
Edge of Telecom Box
Edge of Cable Box
Edge of Post Box
Edge of Bench
Edge of Sign

General Notes
Do not scale off drawing - refer to the tree data schedule for accurate crown spread measurements.
Depictions of tree canopies are based on measurements taken to four cardinal compass points.
No liability of any kind Is accepted for any omissions or inaccuracies in respect of this plan.
The original of this drawing was produced in colour; a monochrome copy should not be relied upon.
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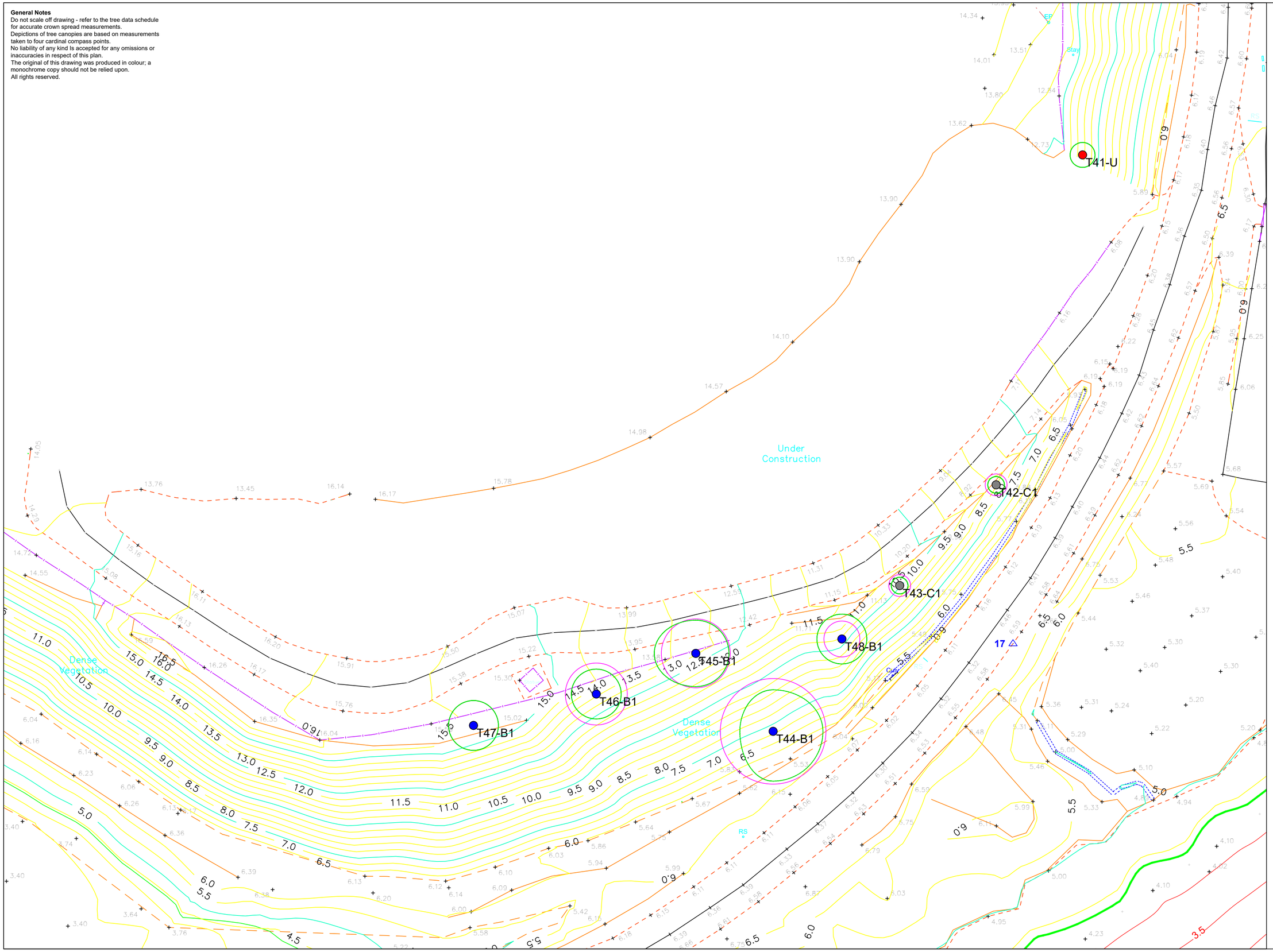


Key

- **T1-B** — Trees: Showing Canopy extents, category colour and tag number (with category).
- Category A: Trees of high quality with an estimated remaining life expectancy of at least 40 years.
- Category B: Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
- Category C: Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.
- Category U: Trees in such a condition that they can not realistically be retained as living trees in the context of the current land use for longer than 10 years.
- BS 5837:2012 Root Protection Area
- Trees for Removal

N

1:300
0 5 10m

Drawing Title	**Tree Removal Plan Ardgour side of the narrows South**
Client	Affric Ltd
Site/Project	Corran Ferry Infrastructure, Improvement Scheme
Scale/Sheet	1:300 @ A2
Date	11/02/2025
Drawing No	24_5837_10_50
Rev	1
Drawn By	PH
Chked By	MH

ROAVR | GROUP
ROAVR Group, Marr House
Beechwood Business Park, Inverness, IV2 3BW
www.roavr-group.co.uk
support@roavr-group.co.uk
01463 667302

Key

Trees
Showing Canopy extents, category colour and tag number (with category).
T1-B

Category A
Trees of high quality with an estimated remaining life expectancy of at least 40 years.

Category B
Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

Category C
Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.

Category U
Trees in such a condition that they can not realistically be retained as living trees in the context of the current land use for longer than 10 years.

BS 5837:2012 Root Protection Area

Trees for Removal

Tree Groups for Removal

ROAVR | GROUP ROAVR Group, Marr House Beechwood Business Park, Inverness, IV2 3BW www.roavr-group.co.uk support@roavr-group.co.uk 01463 667302	Drawing Title **Tree Removal Plan** **Nether Lochabor side of the Narrows North**	Scale/Sheet 1:500 @ A0	Date 11/02/2025		
	Client Affric Ltd	Drawing No 24_5837_10_50	Rev 1	Drawn By PH	Chked By MH
	Site/Project Corran Ferry Infrastructure, Improvement Scheme	**General Notes** Do not scale off drawing - refer to the tree data schedule for accurate crown spread measurements. Depictions of tree canopies are based on measurements taken to four cardinal compass points. No liability of any kind is accepted for any omissions or inaccuracies in respect of this plan. The original of this drawing was produced in colour; a monochrome copy should not be relied upon. All rights reserved.			

N

1:500
0 10 20m

Key

Trees
Showing Canopy extents, category colour and tag number (with category).
T1-B

Category A
Trees of high quality with an estimated remaining life expectancy of at least 40 years.

Category B
Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

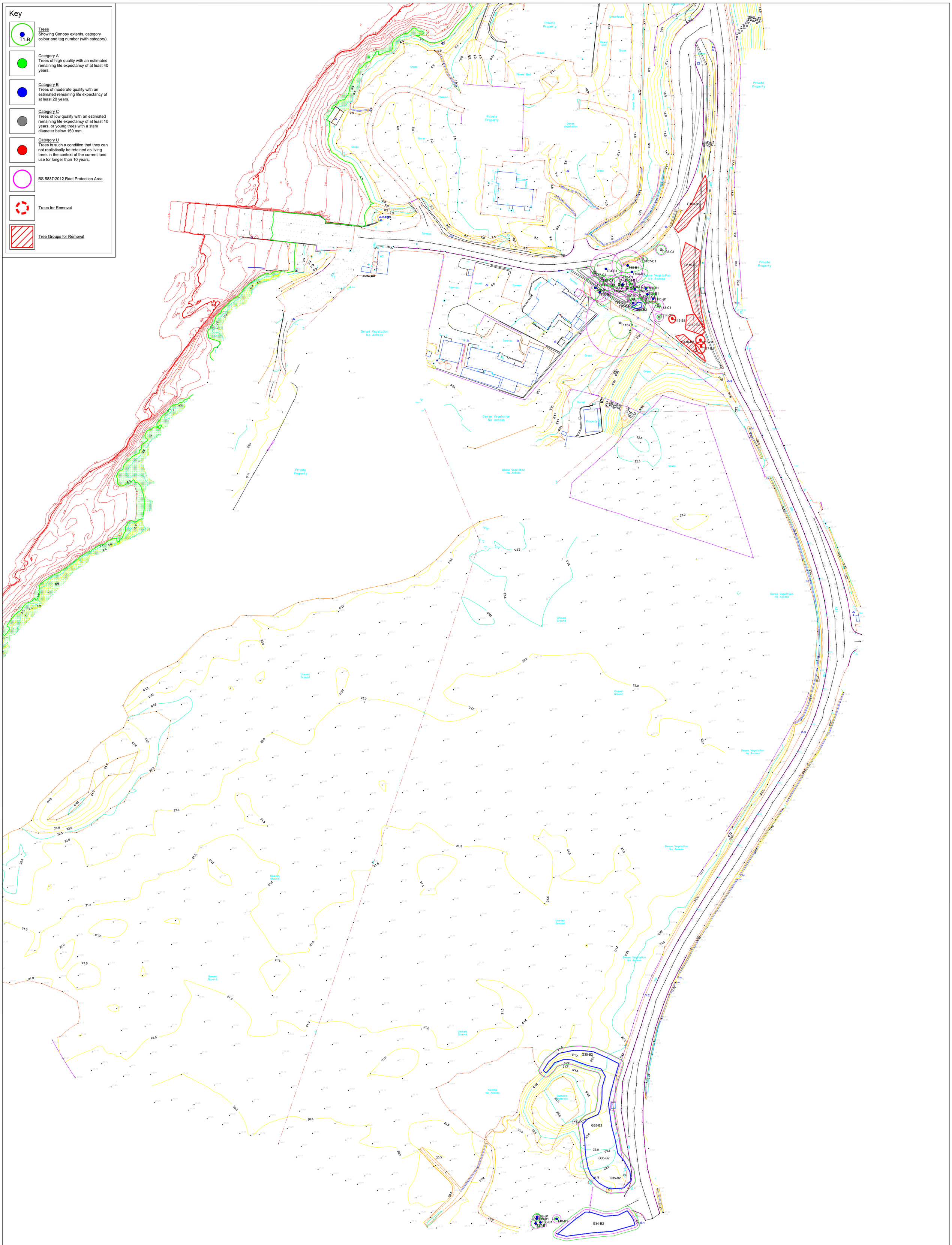
Category C
Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.

Category U
Trees in such a condition that they can not realistically be retained as living trees in the context of the current land use for longer than 10 years.

BS 5837:2012 Root Protection Area

Trees for Removal

Tree Groups for Removal



ROAVR | GROUP ROAVR Group, Marr House Beechwood Business Park, Inverness, IV2 3BW www.roavr-group.co.uk support@roavr-group.co.uk 01463 667302	Drawing Title **Tree Removal Plan** **Nether Lochabor side of the Narrows North**	Scale/Sheet 1:500 @ A0	Date 11/02/2025		
	Client Affric Ltd	Drawing No 24_5837_10_50	Rev 1	Drawn By PH	Chked By MH
	Site/Project Corran Ferry Infrastructure, Improvement Scheme	**General Notes** Do not scale off drawing - refer to the tree data schedule for accurate crown spread measurements. Depictions of tree canopies are based on measurements taken to four cardinal compass points. No liability of any kind is accepted for any omissions or inaccuracies in respect of this plan. The original of this drawing was produced in colour; a monochrome copy should not be relied upon. All rights reserved.			

N

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0 10 20m

Corran Ferry Infrastructure Improvement Scheme

Appendix K.8: Integrated Weed Management Plan

Wallace Stone
Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

INTEGRATED WEED MANAGEMENT PLAN

CORRAN FERRY INFRASTRUCTURE IMPROVEMENT SCHEME, ARDGOUR AND NETHER LOCHABER, FORT WILLIAM, PH33 6SJ

ERS Ref: 0928-005

Plan Last Updated: 17 February 2025

release the value of your land

site investigation, assessment and remediation

INTEGRATED WEED MANAGEMENT PLAN

CORRAN FERRY INFRASTRUCTURE IMPROVEMENT SCHEME, ARDGOUR AND NETHER LOCHABER, FORT WILLIAM, PH33 6SJ

Prepared for:
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IV2 6AW

Prepared by:
ERS
Westerhill Road
Bishopbriggs
Glasgow
G64 2QH

Date of Issue: 20 December 2024
Weed Type(s): Japanese Knotweed (JK), Himalayan Balsam (HB), *Rhododendron ponticum* (RP) and Montbretia (MB)
Period Covered: October 2025 – April 2027

DISCLAIMER

This report has been prepared and written on behalf of Affric Limited in the context of the purpose stated above and should not be used in any other context. New information, improved practices and changes to legislation may necessitate an alteration to the report in whole or in part after its submission and therefore, with any change in circumstances or after the expiry of one year from the date of the report, it should be referred to us for reassessment and if necessary, amendment.

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Status and Approval Schedule:

Issue/Rev	Issue 1	Issue 2	Issue 3
Status	For Client Comment	For Client Comment	
Date	20.12.2024	17.02.25	
Comment	Initial Management Plan	Version 2	
Written by *Job Title* *Signature*	Lianne Cameron Invasive Weeds Surveyor [Redacted]	Lianne Cameron Invasive Weeds Surveyor	
Checked by *Job Title* *Signature*	Christopher Sandground Operations Director [Redacted]	Christopher Sandground Operations Director	

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APPENDICES

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1. INTRODUCTION

1.1 Brief

The Highland Council (THC) are proposing to construct new ferry service infrastructure at the Corran Narrows under the Corran Ferry Infrastructure Improvement Scheme (CFIIS). The scheme will involve the construction of new infrastructure in the village of Ardgour, and just north of the 'Corran' settlement in the region of Nether Lochaber, to facilitate the introduction of roll-on/roll-off ferries including a new electric vessel for the ferry service and improve facilities for users and operators of the Corran Ferry.

Affric Limited, on behalf of THC, commissioned ERS to prepare an Integrated Weed Management Plan (IWMP) for the treatment, control and management of invasive non-native plants (INNP or 'weeds') at the site of the proposed CFIIS during the construction phase. ERS were approached by Affric Limited in October 2024 and were provided with further information regarding the status of the site (see Section 1.2).

1.2 Site Location and Description

For the purpose of this IWMP, 'the site' refers to the CFIIS Planning Boundary as depicted in Drawing 99_DRG_C2_1 (refer Appendix 01), located approximately seven miles south-west of Fort William (PH33 6SJ).

The site is divided into four areas which are located to either side of the Corran Narrows, in Loch Linnhe (a tidal sea loch), covering an area approximately 7ha of land. Areas one and two are situated on the Nether Lochaber side and areas three and four are located on the Ardgour side. The areas are a mixture of amenity grassland, broad leaved and coniferous woodland, scrub and heathland. The site boundaries are within residential and commercial properties, woodland, heathland, grazing pasture and hard infrastructure.

- Area one is bound to the north by the A82 road and woodland, woodland to the east, residential and commercial properties to the south. The western boundary is partly in Loch Linnhe, and with woodland and residential properties.
- Area two is bound to the north and west by scrub and heathland, woodland to the east and an unnamed road to the south.
- Area three is bound to the north, south and west by scrub and woodland and coastal shore to the east.

- Area four is bound to the north and east by Loch Linnhe and to the south and west residential and commercial properties.

The adjacent land uses are residential with gardens, commercial properties with hard standing, woodland, heathland, grazing pasture and hard infrastructure. The site location is typical of a coastal village with residential and commercial buildings having soft and hard landscaping. Areas of woodland, grassland, scrub vegetation and heathland are also present throughout the four areas of the site.

Affric have reported weed infestations at the site include Japanese knotweed (JK), Himalayan Balsam (HB), *Rhododendron ponticum* (RP) and Montbretia (MB) having been observed in 2024. Other than the reported INNP in 2024, there are also mature trees (including, but not limited to, Silver Birch, Alder, Rowan, Sycamore, Scots Pine), common scrub plants (e.g., bracken, brambles, rushes), common broad leaved weeds and grasses.

The RP dominates much of the existing local area and habitats. Some RP clearance was reportedly completed nearby by local landowners in 2023. A patch of JK within the woodland north of the settlement of Corran was chemically treated by another weed management company in September 2024.

2. OVERVIEW OF INTEGRATED WEED MANAGEMENT PLAN

2.1 Brief Description of Integrated Weed Management Plan

This IWMP follows the guidelines produced by Scottish Environment Protection Agency (SEPA) and the PCA. The IWMP is produced with the knowledge provided to ERS at the time and changes to the site plan/activities, or changes to guidance, may require an update to the IWMP.

CFIIS construction works are expected to commence in October 2025 and be complete in early 2027. This IWMP is intended to be maintained and updated as required prior to, and during, the CFIIS construction phase.

It is proposed a INNP survey will be conducted in the Spring of 2025 to determine the extent of the INNP throughout the four areas of the site. After the survey results are known the IWMP will be reviewed and updated accordingly.

2.2 Integrated Weed Management Plan Objectives

The objectives of the IWMP are as follows:

- Prevent the spread of INNP during construction activities of the CFIIS.
- Outline the schedule of treatment to manage INNP infestations (including JK, HB, RP and MB) at the CFIIS site, prior to, and for the duration of, the construction phase.
- Prevent further spread and reduce the root system of JK, seed bank of HB, root system and seed bank of RP and MB during the construction phase.
- To maintain the integrity of property foundations, the unnamed burn and minimise non-target vegetation loss throughout the treatment process.

2.3 Limitations and Threats to Site Management Objectives

The presence of INNP poses a threat to, or limits management objectives in several ways, as follows:

- Blights a property.
- Increasing costs of development / landscaping / grounds maintenance.
- Delays in scheduling works.

- Damage or potential damage caused by the plants.
- Potential for spread of INNP from within and outside the site boundary (e.g. from within the site, from adjacent land or via a watercourse).
- Potential for exporting of INNP if material is removed from site.
- Poses a threat to biodiversity in surrounding areas.
- Where watercourses are present, increases flood risks by impeding river water flow.
- Increases the risk of riverbank erosion.
- Loss of amenity and recreational space.

2.4 Inventory of the Site

Access to areas one and two can be gained via the A82 road and areas three and four can be gained via the A861 road.

The remainder of this section will be populated with appropriate information following the site survey conducted in Spring 2025.

2.5 Setting Priorities

High Priority

High priority actions are described below:

1. Known areas of INNP infestations which require rapid treatment:
   - Specific areas will be indicated on the site plan which will be impacted by the proposed construction works, as Appendix 02, following the Spring 2025 survey.

2. Prevention of further spread:
   - Construction works will be carried out within or near to the footprints of the INNP by contractors and sub-contractors. During any site inductions **all** personnel **must** be made aware of the INNP and robust biosecurity must be in place if accessing these areas for the duration of the IWMP. ERS has not included for this notification and it should be undertaken by others.
   - INNP can currently be accessed by residents and members of the public. Areas where INNP will not be controlled an exclusion zone of 10m from the last stem observed should be identified with markers and / or barriers / fencing with appropriate notice should be erected. ERS has not included for installation and it should be undertaken by others.

- All biosecurity measures **must** be in place and adhered to.
- Any suspicions of new areas of INNP growth **must** be reported to the Construction Contractor and / or CFIIS Project Team Manager immediately.

Medium Priority

Medium priority actions are described below:

1. Management and control methods for known INNP stands:
   - Compliance with the IWMP will be reviewed on a regular basis.

2.6 Preventing Further Spread

The following methods have been identified to prevent further spread:

- Robust biosecurity and exclusion zones should be implemented in any direction 10m from the last stem observed, adequate signage erected and access restricted to ERS Invasive Weeds Technician only, whilst control undergoing. Permissions to enter and/or work within any exclusion zones must be authorised by ERS. This zone should be installed by the Client.
- During each control and monitoring visit, an area spanning 10m in all directions beyond the last stem identified will be thoroughly inspected to prevent new growth being missed and sufficient control being implemented.

2.7 Biosecurity

Biosecurity is about reducing the risk of introducing or spreading invasive non-native species (and includes other hazards such as pests and disease) in the wild.

The INNP are all highly invasive and can be spread easily and can quickly colonise large areas. For example, fragments of stems or roots from JK can easily regrow if disturbed and given the right conditions to proliferate, for example, during site clearance works and relocated to new areas. If INNP are not managed correctly, they may spread to other areas causing additional future costs and labour to control them and may also pose public health and safety risks.

The common ways that INNP can be spread throughout the site are:

- Vegetation clearance of the site, mowing, tree cutting or other landscaping activities.
- Spread of seeds or fragments of the plant when moving or relocating soils.
- Spread of seeds or fragments of the plant via the watercourse, surface water and / or drainage.
- Contamination of equipment or vehicles with seeds or fragments of the plant then transported to other areas of the site.
- Importing soils to site which may be contaminated with INNP propagules.

There is a risk of introducing INNP to clean sites e.g. machinery / equipment being used on multiple sites, staff travelling between infested and uninfected sites. Machinery, vehicles and footwear may provide a vector for INNP to spread and preventative measures must be taken.

A Biosecurity Plan must be implemented on site during the construction works of the CFIIS including but not limited to the following.

Examples of preventative measures can include:

- Secure site to ensure control over access and egress is maintained.
- Ensure security in place to prevent fly tipping which can create a pathway for INNP propagules being introduced to the site.
- Machinery and equipment brought to site must be clean and free from soils and vegetation propagules.
- Effective communication to ensure all site personnel are aware of the in place biosecurity measures.
- Movement of machinery and equipment between locations on site must be thoroughly cleaned and inspected.

A combination of control options will be implemented to allow for the proposed construction works to be completed and to control the INNP observed on the site.

3. CFIIS CONTROL PLAN

3.1 Site Identification Details

Site Name: CFIIS, Corran Ferry, Ardgour and Nether Lochaber, Fort William, PH33 6SJ
Responsible Manager: Andrew MacIver, THC Date plan last updated: 17 February 2025

3.2 Management Objectives

The following measurable objectives have been established for the planned control activities:

- Objective 1: Contain and prevent the spread of INNP infestation beyond the CFIIS construction activities.
- Objective 2: Treat known INNP infestations on site during the construction period of the CFIIS.

All identified areas of INNP which impede the proposed construction works will require control however, some INNP are more problematic than others. JK would be a high priority for removal if the JK footprint is to be developed on, followed by HB, RP and MB.

3.3 Management Options

There are several control methods which can be considered for the INNP currently known to be present on site (JK, HB, RP and MB) as follows:

- In situ herbicide treatment,
- Manual hand removal (HB, RP and MB only),
- Cutting and strimming (HB and RP only),
- Mowing or grazing (HB only),
- Combined excavation to landfill and herbicide treatment,
- Excavation and stockpiling for future treatment,
- Screening of material (JK only),
- Rhizome fragmentation and cultivation (JK only),
- Excavation for onsite burial,
- Excavation to landfill and root barrier along boundaries (JK only),
- Excavation for removal off site to landfill.

The pros and cons of these different methods are provided in Appendix 03.

The site of the CFIIS is best suited for combined excavation and herbicide treatment in consideration of construction proposals and timescales.

Remediation of these INNP can be extremely difficult, especially given the presence of INNP infestations in land surrounding the CFIIS site and the wider region. If other INNP are observed on Loch Linnhe there is a high risk that the tidal action of the waterbody will aid the spread of INNP elsewhere. The adjacent land within 1m of the site has INNP present and this may aid the spread of INNP across boundaries. This increases the risk that INNP will re-infect the site's ground with new INNP in the future.

There is a risk that any future ground disturbance could cause re-growth of dormant INNP rhizomes (refer Appendix 03).

3.4 Planned Actions

The following potential actions may be implemented subject to the findings of the site survey conducted in Spring 2025.

The objective is to prevent offsite spread associated with CFIIS construction works and to control the INNP directly impacted by the construction works.

Area	Control Method	Carried out by
Areas indicated on the site plan.	In situ herbicide treatment • Treat affected area with an appropriate herbicide. • Treatment to be carried out two times per growing season. April – October. Manual hand removal (HB, RP and MB only) • Treatment to be carried out two times per growing season. May – August. Cutting and strimming (HB and RP only) • Treatment to be carried out two times per growing season. May – August. Mowing (HB only) • Treatment to be carried out two times per growing season. May – August.	TBC

	Combined excavation to landfill and herbicide treatment • Treatment to be carried out once prior to development works commencing. August – September Excavation and stockpiling for future treatment • Treatment to be carried out once prior to development works commencing. August – September Screening of material (JK only) • Treatment to be carried out once prior to development works commencing. August – September Rhizome fragmentation and cultivation (JK only) • Treatment to be carried out once prior to development works commencing. August – September Excavation to landfill and root barrier along boundaries (JK only) • Treatment to be carried out once prior to development works commencing. August – September Excavation for removal off site to landfill • Treatment to be carried out once prior to development works commencing. August – September	

3.5 Implementation Schedule

The remainder of this section will be populated with appropriate information following the site survey conducted in Spring 2025.

Implementation Schedule	Date
INNP Survey	Spring 2025
IWMP Update	Summer 2025
Herbicide treatment carried out twice annually	April/May – August/September 2025

3.6 Monitoring

Monitoring will be carried out during each visit. Recording sheets for monitoring and herbicide treatments will be used to document the condition of the observed INNP at affected areas on site (see Appendix 04 and 05 respectively). It is proposed photographic evidence of progress will be recorded and documented as an appendix to this IWMP at the end of each growing season.

Changes to site conditions will be reported to the Construction Contractor and/or the CFIIS Project Team manager and the IWMP amended if deemed necessary.

3.7 Resource Requirements

The following resources will be utilised:

- Invasive weed technician(s).
- Suitable herbicide.
- Suitable sprayer / injection tool.
- 14 tonne excavator/JCB 3C, or similar (as required)
- 8-12 yard skips, or similar (as required)
- Backacter(s), or similar (as required)
- 18 tonne tippers, or similar (as required)

4. SUMMARY INFORMATION

4.1 Treatment – Priority Areas

Area	Description and justification of priority	Priority Level
Areas indicated on the site plan.	Blights a property. Increasing costs of development / landscaping / grounds maintenance. Delays in scheduling works. Damage or potential damage caused by the plants. Potential for spread of INNP from within and outside the site boundary (e.g. from within the site, from adjacent land or via watercourse). Potential for exporting of INNP if material is removed from site. Poses a threat to biodiversity in surrounding areas. Where watercourses are present, increases flood risks by impeding river water flow. Increases the risk of riverbank erosion. Loss of amenity and recreational space.	High
Areas indicated on the site plan.	Implementation of the IWMP will be reviewed on a regular basis.	Medium

4.2 Risk Management

Area	Risk Management	Carried out by
Areas indicated on the site plan.	Construction works will be carried out within or near to the footprints of the INNP by contractors and sub-contractors. During any site inductions **all** personnel **must** be made aware of the INNP and robust biosecurity must be in place if accessing these areas for the duration of the IWMP. ERS has not included for this notification and it should be undertaken by others. INNP can currently be accessed by residents and members of the public. Areas where INNP will not	The Client

	be controlled an exclusion zone of 10m from the last stem observed should be identified with markers and / or barriers / fencing with appropriate notice should be erected. ERS has not included for installation and it should be undertaken by others. All biosecurity measures **must** be in place and adhered to. Any suspicions of INNP growth **must** be reported to the ERS Invasive Weeds Technician immediately.	

The control and biosecurity programme are designed to continue for the duration of the construction works.

Extended control is recommended if several factors prevent or hinder the treatment of INNP as per the IWMP. For example, the maturity and the establishment of the INNP, adjacent INNP, on site disturbances e.g. excavation, cutting, or relocation of soils.

Deep and / or buried rhizomes can remain dormant, but viable, for many years, even after above ground material has been successfully treated with herbicide. This will restrict the amenity use of the area during the monitoring and guarantee term offered and there is a risk that any future excavation beyond the IWMP period could cause re-growth of dormant rhizomes.

Any soil, or other material, containing INNP treated or not, is still classified as controlled waste. If removed from site it must be disposed of at an appropriately licensed landfill facility with Duty of Care documentation in place.

Growing seasons can vary from year to year, therefore, timings of the control works will need to be altered if required.

Adjacent landowners with INNP that present a risk of spread onto the site should be informed of their obligations under the Wildlife and Countryside Act 1981 to control INNP from spreading outwith their land. Liaising with adjacent landowners to ensure treatment of adjacent INNP would reduce the risk to the site and the affected landowners.

5. REFERENCES

Wildlife and Countryside Act 1981 – www.legislation.gov.uk/ukpga/1981/69

Wildlife and Natural Environment (Scotland) Act 2011 - www.legislation.gov.uk/asp/2011/6/contents/enacted

Great Britain Non – Native Species Secretariat - www.nonnativespecies.org/home/index.cfm

Scottish Environment Protection Agency (SEPA) - www.sepa.org.uk

NatureScot – www.nature.scot

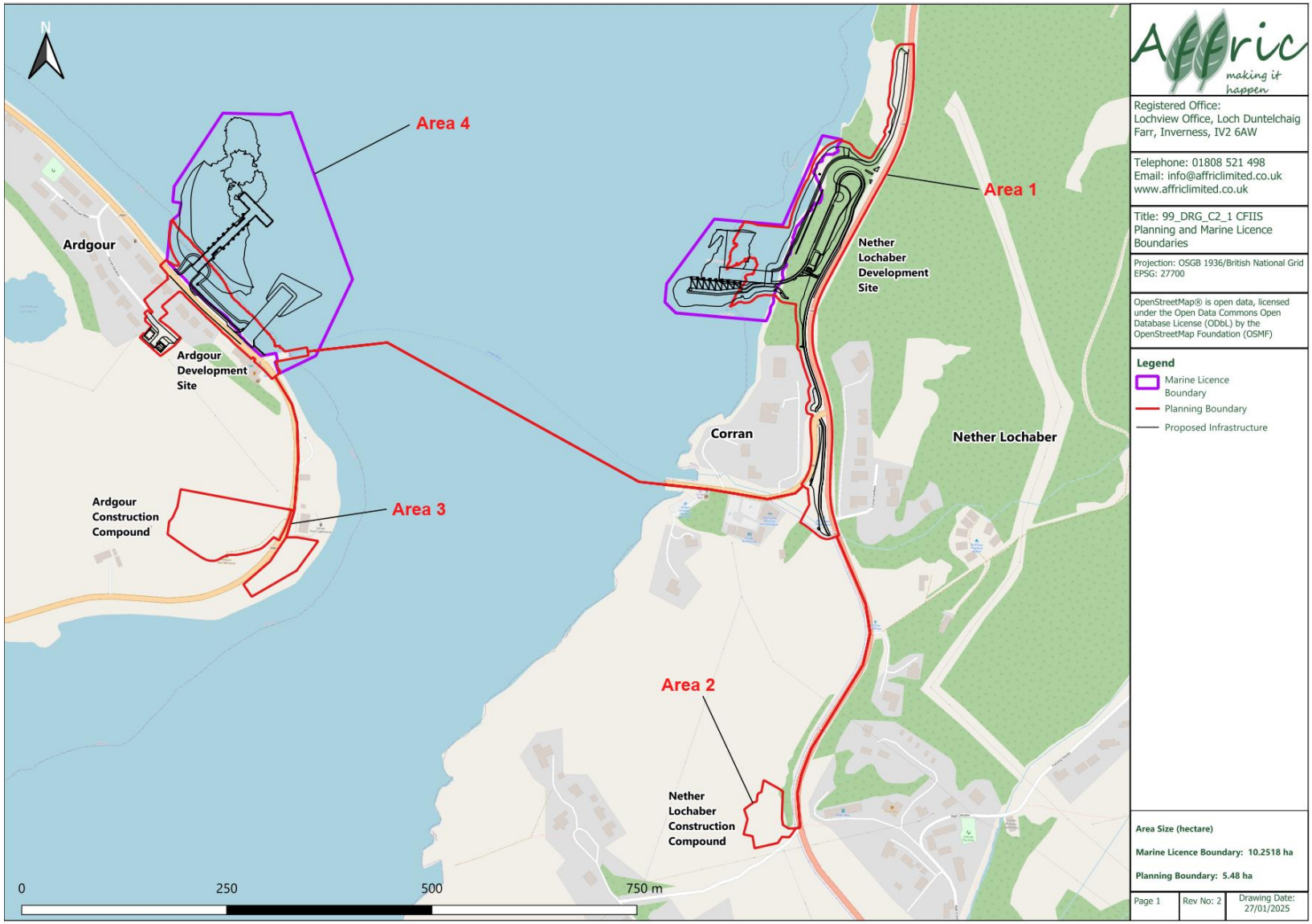
Department for Environment, Food & Rural Affairs – www.gov.uk/guidance/prevent-the-spread-of-harmful-invasive-and-non-native-plants

Property Care Association (PCA) - www.property-care.org

Netregs – www.netregs.org.uk/environmental-topics/land

Royal Institution of Chartered Surveyors (RICS) – www.rics.org/uk

Appendix 01 – Site Plan Identifying Area(s)



Appendix 02 – Site Map Identifying Invasive Non-Native Plants Location(s)

To be inserted following the INNP survey conducted in Spring 2025.

Appendix 03 – PCA Control Options – Pros and Cons

Herbicide treatment	
Pros	**Cons**
Cost effective. Treatment can be carried out in situ without risk of spreading the plant further. Quickly reduces the capacity of the plant to spread on/off site. Quickly eliminates the capacity of the plant to impact built structures. Easy to administer. Less labour intensive (HB). Highly effective at killing the adult plants (HB). Can reach otherwise inaccessible plants.	Can take many years to achieve acceptable results, especially where stands are mature. Management plans that rely solely on herbicide treatment must include at least 2 years of monitoring after all evidence of growth has ceased. Herbicide treatment alone should not be recommended on sites with future development plans that involve the soil being dug and disturbed. Construction works cannot continue in areas still containing the plant and the risks associated with landscaping treated soils, e.g. stimulating regrowth, should be made clear to the client and mitigated for. The use of some herbicides is restricted near waterbodies and desired vegetation. Some herbicides can persist in the soil. If soil is disturbed at a later date, regrowth can occur. Effective control requires expert knowledge of herbicide treatment of JK. Soil which contains JK that had been treated with herbicide is still classed as controlled waste if it enters the waste stream. Herbicide treatment can induce temporary dormancy. Can have a negative environmental impact on other plants, including non-target species. Application can be limited by weather conditions Would need repeating annually until seedbank is depleted (GH and HB). Possibly effective on a catchment scale but would require significant investment.
Hand pulling (HB)	
Pros	**Cons**
Effective when stems are a minimum 50cm tall and before seeds develop. Kills plant before it has an opportunity to disperse its seeds. Can target specific plants. Avoids the use of herbicide.	Labour intensive and time-consuming. Can regrow if species is located upstream or on adjacent land. Would need repeating annually until seedbank is depleted. Not a long term solution if control is required on a catchment scale. Easy to miss small shoots hidden by surrounding vegetation. Disposal or management of collected plants.
Strimming/Cutting (GH and HB)	
Pros	**Cons**
Immediately kills adult plants. Avoids herbicide use. If done before seeds set, it will kill plants before seeds can disperse.	Labour-intensive and has associated equipment related costs and hazards. Can damage non-target species. Can regrow if species is located upstream or on adjacent land. Treatment would need repeating annually until seedbank is depleted. Not a long term solution if control is required on a catchment scale.
Mowing/ Grazing (GH and HB)	
Pros	**Cons**
Cost effective method. Avoids herbicide use.	Damage non-target species. Can potentially stimulate “bushy” growth by removing apical dominance, which could increase seed production if grazing not managed effectively. Livestock require managing. Mowing unsuitable for uneven ground and woodlands. Would need repeating annually until seedbank is depleted.

Stockpiling	
Pros	Cons
• Cost effective. • Site work can be undertaken while treatment takes place elsewhere on-site.	• Requires an area that can be left undisturbed for several years. • Soil from a stockpile must remain on the site. • The same cons as herbicide treatment apply in the stockpile area. • Plant material can be accidently spread e.g. after a change in ownership. • The depth of the stockpiled soil must be appropriate for the future use of the soil. • Rhizome buried deeper in a bund is less likely to express itself and may become dormant; as such, bunds should be created as shallow as is practical and should not exceed 0.5m • If larger bunds are created, it may be necessary to apply for planning permission.
Screening (JK)	
Pros	Cons
• Can be cost effective but not always. • Less material needs to be disposed of to waste facility. • The treated soil can be re-introduced on site as fill or in soft landscaping areas. • Where soil needs to be imported, less is required from elsewhere to fill voids created by excavation.	• All screened soil is still classed as controlled waste. • Small fragments of JK will still be present in the soil and could lead to re-infestation. • Area where screened soils are re-used must be monitored for regrowth. • Follow up herbicide treatment or manual removal may be required. • Plant material can be accidently spread during movement. • Soil type and makeup dictate if it can be screened or not.
Rhizome fragmentation and cultivation, including crown removal (JK)	
Pros	Cons
• Increases the leaf surface area to rhizome ratio. • Breaks up and aerates the soil. • Can increase the effectiveness of herbicides under certain scenarios. • Can improve the potential for remediation on sites where the JK is persistent. • Crown removal removes a large amount of surface and underground biomass.	• Most above ground vegetation must be cleared, even desirable plants. • Cleared vegetation would usually need to be disposed of. • A large area must be dug to ensure all rhizome containing soil has been included. • Rhizome located deeper in the soil may be missed and result in regrowth. • Soil should be compacted at the end of the treatment to help reduce the potential of deep soil rhizome regrowth. • Crown removal can be time consuming or impractical for large infestations and removed crown must be managed appropriately.
Burial	
Pros	Cons
• Does not require a set-a-side area for control. • Work can continue immediately after burial. • Quickly removes the JK from an undesirable area.	• Restrictions remain on site, e.g. in some areas deep excavation would interfere with buried material. • The use of the area above burial site is limited. • Typically requires a large hole to receive material, so it may not be possible if soil is shallow or water table is high. • The appropriate environment agency must be notified. • Plant material can be accidently spread during movement.
Root barrier (JK)	
Pros	Cons
• Can be installed to reduce the chance of horizontal and vertical rhizome spread. • Can be used to protect structures, hard surfaces and services. • Work can continue immediately after installation in areas protected by membranes.	• Tears in the membrane or poorly sealed seams between sheets can be exploited by growing rhizome. • Can only be installed in favourable weather conditions. • Damp and/or wet conditions and/or works surfaces will reduce the robustness of heat welded seals. • Surface drainage and underground water can affect installation and ponding can occur, all of which must be taken into consideration. • Installation of root barrier is a form of control/prevention to be used in conjunction with other methodology, as it is not in itself a method of remediation.

Landfill	
Pros	Cons
▪ Quickly removes the JK from an undesirable area. ▪ No restrictions left onsite. ▪ Work can continue immediately after removal. ▪ Fast and efficient.	▪ Relatively expensive. ▪ Disposal to landfill reduces valuable landfill capacity and need haulage (which damage the environment and increase the risk of JK spreading) and in the long term unsustainable. As such, disposal to landfill should only be considered as last resort when JK cannot be suitably disposed of on-site.

Appendix 04 – Invasive Weeds Recording Sheet

INVASIVE WEEDS RECORDING SHEET

Recorded by;			Date;		
Site Name;			Client Name/Contact;		
Post Code;			Site Ref;		
Number of Photographs Taken;					
Non-Native Invasive Weeds	Japanese knotweed (JK)		Giant hogweed (GH)		Himalayan balsam (HB)	
	Cotoneaster horizontalis (CH)		Cotoneaster simonsii (CS)		Cotoneaster bullatus (CB)	
	Contoneaster integrifolius (CI)		Rhododendron ponticum (RP)		American Skunk Cabbage (ASC)	
	Giant Rhubarb (GR)		Japanese Rose (JR)		Montbretia (MB)	
	Few-flowered Leek (FFL)		Curly Waterweed (CW)		New Zealand Pygmyweed (NZP)	
Problematic Weeds	Horsetail (HT) (native)		Ragwort (RW) (native)		Buddleja davidii (BD) (non-native)	
	Bamboo (BB) (non-native)		Garden Lupin (GL) (non-native)			
Area of Invasive weeds - note; mark outline of area of Invasive weeds on site map and annotate with site ref. no. If patch measures <1.0m^2, mark as + on map and annotate with site ref. no.						
Average Height of Stems;	<1m		1 - 2.5m		>2.5m	
Max. Stem Diameter at 30cm Above Ground	<1cm		1 - 2cm		>2cm	
Vegetation Composition	Mixture of JK & other vegetation		Mixture of GH & other vegetation		Mixture of HB & other vegetation	
	Mixture of CH & other vegetation		Mixture of CS & other vegetation		Mixture of CB & other vegetation	
	Mixture of CI & other vegetation		Mixture of RP & other vegetation		Mixture of ASC & other vegetation	
	Mixture of GR & other vegetation		Mixture of JR & other vegetation		Mixture of MB & other vegetation	
	Mixture of FFL & other vegetation		Mixture of CW & other vegetation		Mixture of NZP & other vegetation	
	Mixture of HT & other vegetation		Mixture of RW & other vegetation		Mixture of BD & other vegetation	
	Mixture of BB & other vegetation		Mixture of GL & other vegetation			
Proximity to Water Courses (within 10m)	Yes			No		
Slope	Flat		Moderate		Steep	
Land use - Record primary land use as a 1 and secondary use as 2 etc. e.g.. Landscaped area adjacent to riverbank record as Riverbank 1; Landscaped area 2.						
Housing		Shops		Communal Area		Business/ Industrial	
Garden		Park		Recreation Ground		Landscaped Area	
Farmland		Woodland		Waste Ground		Graveyard	
Car Park		Road Verge		Railway Embankment		Development Site	
River Bank		Stream Side		Dock		Canal	
Pond		Sea Front		Hedgerow		Other, Specify	
Remarks:						

Appendix 05 – Treatment Record

Site Treatment Record

ERS Ref.		Site:		Client:				Site Agent:				
Risk Assessment Read and Understood:				Method Statement Read and Understood:				COSHH Sheets Read and Understood:				
PPE Used:-	Coveralls:		Safety boots:		Mask:		Gloves:		Additional PPE:			
Special Health Considerations:												
Weather Conditions:	Dry		Wet		Calm		Windy		Sunny		Overcast	
Associated Site Boundary Description:	Residential		Schools		Hospitals		Care Homes		Industrial/ Commercial		Open ground	
Spray Equipment:												
Pesticide(s) Used	1				2				3			
Batch Number												
Dilutions Used:												
Estimated No. of People in the Area:					No. of People Downwind of Spraying:							
Warning of Spraying Activities Issued to Site Staff / Neighbours:												
Start Spray Time		Finish Spray Time			Total Volume Sprayed:				Means of Disposal:			
MONITORING NOTES:												
Spraying Technician Name:					Signature:				Date:			

Appendix 06 – Site Photographs

To be inserted following the INNP survey conducted in Spring 2025.

Appendix 07 – ERS Overview

ERS provides imaginative solutions to contaminated land management. We offer a full range of site investigation, assessment, remediation and technical services, via our multidisciplinary team of scientists and engineers covering fields such as geology, geotechnical and civil engineering, environmental science, hydrogeology and invasive non-native weeds.

ERS is an employee owned company, head quartered in Glasgow. Over the last 20 years we have delivered a comprehensive range of solutions to fulfil the diverse needs of our clients including housing associations, local authorities, consultants, developers, property owners, supermarkets, main contactors, factors and loss adjusters.

We treat a range of ground and water contaminants including hydrocarbons, chlorinated solvents, chromate, heavy metals and have extensive capabilities for invasive non-native weeds management. We have considerable experience in the fields of both on and off site remediation techniques, utilising a range of physical, chemical, thermal and biological solutions.

We also offer a range of waste classification and waste management services. We are licensed waste carriers and have both mobile treatment facilities and soil treatment supply partners located throughout Scotland, minimising both landfill disposal and landfill tax liability.

More information for ERS can be found at www.ersremediation.com.

Accreditations – Property Care Association

ERS are members of the Property Care Association (PCA) for Invasive Non-Native Weed Control. Our PCA Membership number is 5718, included as Appendix 09.

The PCA developed this membership group to provide consumers with a means of identifying specialist contractors who can provide the level of expertise, experience and standards required to control and manage invasive non-native weeds. Membership criteria is very strict, and our accreditation is demonstrative of the highest levels of both technical knowledge and practical skill delivered by our Invasive Weeds team.

Our membership also allows us to provide clients with ten year insurance backed guarantees for Japanese knotweed remediation. More information on the Property Care Association can be found at www.property-care.org.

Appendix 08 – PCA Certificate

Certificate of Membership 2025

This is to certify that

Environmental Reclamation Services Ltd

Is a Member of the Property Care Association

Membership number: 5718

Represented by the PCA in the following sectors

Invasive Weed Control

[Redacted]

Sarah Garry
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OCEAN ECOLOGY
A DNV COMPANY

Corran Ferry Infrastructure Improvement Scheme

Appendix N.1: Subtidal Benthic Survey Report

Affric
making it happen

Wallace Stone
Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

OCEAN ECOLOGY

Marine Surveys, Analysis & Consultancy

Corran Ferry Ground Investigation Surveys: Technical Report

REF: OEL_ CAUCOR0623_TCR_V02

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Version

Version	Date	Description	Author(s)	Reviewed By	Approved By
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V02	26/04/2024	Client Submission	Dr Elena Cappelli		

Updates

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1	Updated information on project roles and introduced Affric's role in the project	10

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Abbreviations

AFDW	Ash Free Dry Weight
AL	Action Level
BIIGLE	Bio-Image Indexing and Graphical Labelling Environment
BSH	Broad-Scale Habitat
CATAMI	Collaborative and Annotation Tools for Analysis of Marine Imagery
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CLOC	Clear Liquid Optical Chamber
DDC	Drop-down Camera
EC	European Commission
EMODNet	European Marine Observation and Data Network
EU	European Union
EUNIS	European University Information Systems
FOCI	Features of Conservation Importance
GPS	Global Positioning System
HA	Habitats Assessment
HD	High Definition
HOCI	Habitat of Conservation Importance
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
LED	Light-emitting diode
MP	Megapixels
MSFD	Marine Strategy Framework Directive
NMBAQC	NE Atlantic Marine Biological Analytical Quality Control
nMDS	Non-Metric Multi-Dimensional Scaling
OEL	Ocean Ecology Ltd.
OSPAR	Oslo Paris
PSD	Particle Size Distribution
QAF	Quality Assurance Framework
QC	Quality Control
RSMP	Regional Seabed Monitoring Plan
SAC	Special Area of Conservation
SE	Standard Error
SIMPER	Similarity Percentages
SIMPROF	Similarity Profile
UK	United Kingdom
UPS	Uninterruptable Power Supply
USBL	Ultra-short Baseline
UTM	Universal Transverse Mercator
WoRMS	World Register of Marine Species

Non-Technical Summary

Introduction

Causeway Geotech have been commissioned by Wallace Stone LLP to undertake Ground Investigation surveys to inform the detailed design of new ferry infrastructure to support the introduction of electric vessels on the Corran Ferry route. The Corran Ferry, operated by The Highland Council, crosses Loch Linnhe from the Eastern side of Nether Lochaber to the Western side of Ardgour. The ferry operates a regular service 7-days a week, providing a vital ferry connection, linking the communities of Fort William, Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Morvern and the Isles of Mull.

Survey Strategy

A sampling plan was developed prior to the survey being undertaken which included 9 Drop-Down Camera (DDC) transects within the survey area. The sampling plan was further modified while on survey to include four additional DDC transects (K1 – K4) to confirm the presence of kelp beds which were observed while in the field, and seven grab samples for macrobenthic and sediment analysis which were located along the DDC transects following initial interpretation of substrate type. The pre-planned Transect T09 was inaccessible due to its location on a drying area and Transect T10 was added and sampled as a replacement. Due to shallow waters close to shore which prevented safe access to these areas, Transects T06 and T07 were extended on the deeper end to maintain the proposed length of the original transect.

Seabed Imagery Analysis

Diverse habitats encompassing Broad Scale Habitat (BSHs) A3.1, A3.2, A3.3, A4.1, A4.2, A5.1, A5.4, and A5.5 were identified across the survey area. Notably, A5.5 'Subtidal Macrophyte Dominated Sediment' was the most dominant BSH with the biotope, A5.521 '*Laminaria saccharina* and red seaweeds on infralittoral sediments' being the most frequently encountered. This biotope corresponds to the Priority Marine Feature (PMF) habitat 'Kelp and Seaweed Communities on Sublittoral Sediment,' recognized for its conservation significance in Scottish waters. Three additional habitats representative of PMFs were observed in the survey area, specifically 'Kelp beds,' 'Low or Variable Salinity Habitats,' and 'Tide-Swept Algal Communities'.

For the PMF 'Kelp beds', the corresponding EUNIS biotopes were A3.115 *'Laminaria hyperborea* with dense foliose red seaweeds on exposed infralittoral rock', A3.2121 '*Laminaria hyperborea forest, foliose red seaweeds and a diverse fauna on tide-swept upper infralittoral rock'*, A3.214 ' *Laminaria hyperborea* and foliose red seaweeds on moderately exposed infralittoral rock', and A3.2143 'Grazed *Laminaria hyperborea* forest with corraline crusts on upper infralittoral rock'.

For the PMF 'Low or Variable Salinity Habitats', the corresponding EUNIS habitat was A3.322 '*Laminaria saccharina* and *Psammechinus miliaris* on variable salinity grazed infralittoral rock'; while for the PMF habitat 'Tidal-swept Algal Communities' representative habitats were A3.222 'Mixed kelp and red seaweeds on infralittoral boulders, cobbles and gravel in tidal rapids' and A3.126 '*Halidrys siliquosa* and mixed kelps on tide-swept infralittoral rock with coarse sediment'.

All imagery underwent an Annex I Reef assessment which identified various reef types including Low Stony, Low Stony and Bedrock, Bedrock, and Bedrock and Low Stony reefs. The DDC transects covering these rocky reefs primarily included T04, T05, T06, T07, T08, and T10, and Kelp transects K3 and K4.

Sediment PSD

Among the 7 sediment samples, BSHs A5.1 'Coarse sediment' and A5.4 'Mixed Sediment' were predominant at stations ST04, ST02, ST08, and ST01, ST03, ST05, ST07, respectively. Sand emerged as the most abundant grain size fraction, followed by gravel. These findings align with the area's topography, especially given their proximity to the coast.

Macrobenthos

Within the 7 macrobenthic samples collected across the project area, a total of 3,780 individuals and 185 taxa were recorded. Nematoda (roundworms) were the most abundant taxa. The annelid *Pholoe inornata* exhibited the greatest occurrence across the survey area. One macrobenthic group including stations ST01, ST03, and ST05 was identified across the survey area and it was dominated by taxa with a preference for mixed sediments. Key species such as *Amphipholis. squamata* suggested that the biotope best matching the fauna in this group was A5.433 '*Venerupis senegalensis*, *Amphipholis squamata*, and *Apseudes latreilli* in infralittoral mixed sediment'. These results go hand in hand with the sediment and the imagery analysis, where gravel and sand were equally contributing to sediment composition. None of the other stations grouped together based on their macrobenthic assemblage. However, seabed imagery collected in closed proximity of grab samples ST02, ST04, ST07 and ST08 provided evidence of the PMF habitat 'Kelp and Seaweed Communities on Sublittoral Sediment' being present. Despite some of the macrobenthic community recorded at stations ST02, ST04, ST07 and ST08 aligned with that typically found associated with kelp and seaweed communities including ascidians, gastropods and amphipods, the habitat assignment of these stations was left at EUNIS Level 4 rather than 5 due to the lack of consistent data identifying a specific biotope.

1. Introduction

1.1. Project Overview

Causeway Geotech, the principal contractor, have been commissioned by Wallace Stone LLP to undertake Ground Investigation surveys to inform the detailed design of new ferry infrastructure to support introduction of electric vessels on the Corran Ferry route.

The ferry service shall continue to operate throughout the period of the Ground Investigation works without disruption, except during periods when adverse weather and any other operational factors prevent the service from operating on the published timetable.

1.2. Site information

The Corran Ferry, operated by The Highland Council, crosses Loch Linnhe from the Eastern side of Nether Lochaber to the Western side of Ardgour. The ferry operates a regular service 7-days a week, providing a vital ferry connection, linking the communities of Fort William, Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Morvern and the Isles of Mull (Figure 1).

1.3. Aims and Objectives

OEL were commissioned by Causeway Geotech to undertake a Drop-Down Camera (DDC) transect survey, grab sampling and subsequent analysis and reporting, required to provide marine habitat and species data to inform the Environmental Impact Assessment (EIA) Report to be prepared by Affric Limited, the Highland Council's environmental advisor for the Corran Ferry Infrastructure Improvement Scheme (CFIIS).

The DDC transect survey and environmental grab sampling was undertaken at 9 locations across the survey area. Additional DDC transects were surveyed to confirm the presence of kelp bed areas and their approximate extent.

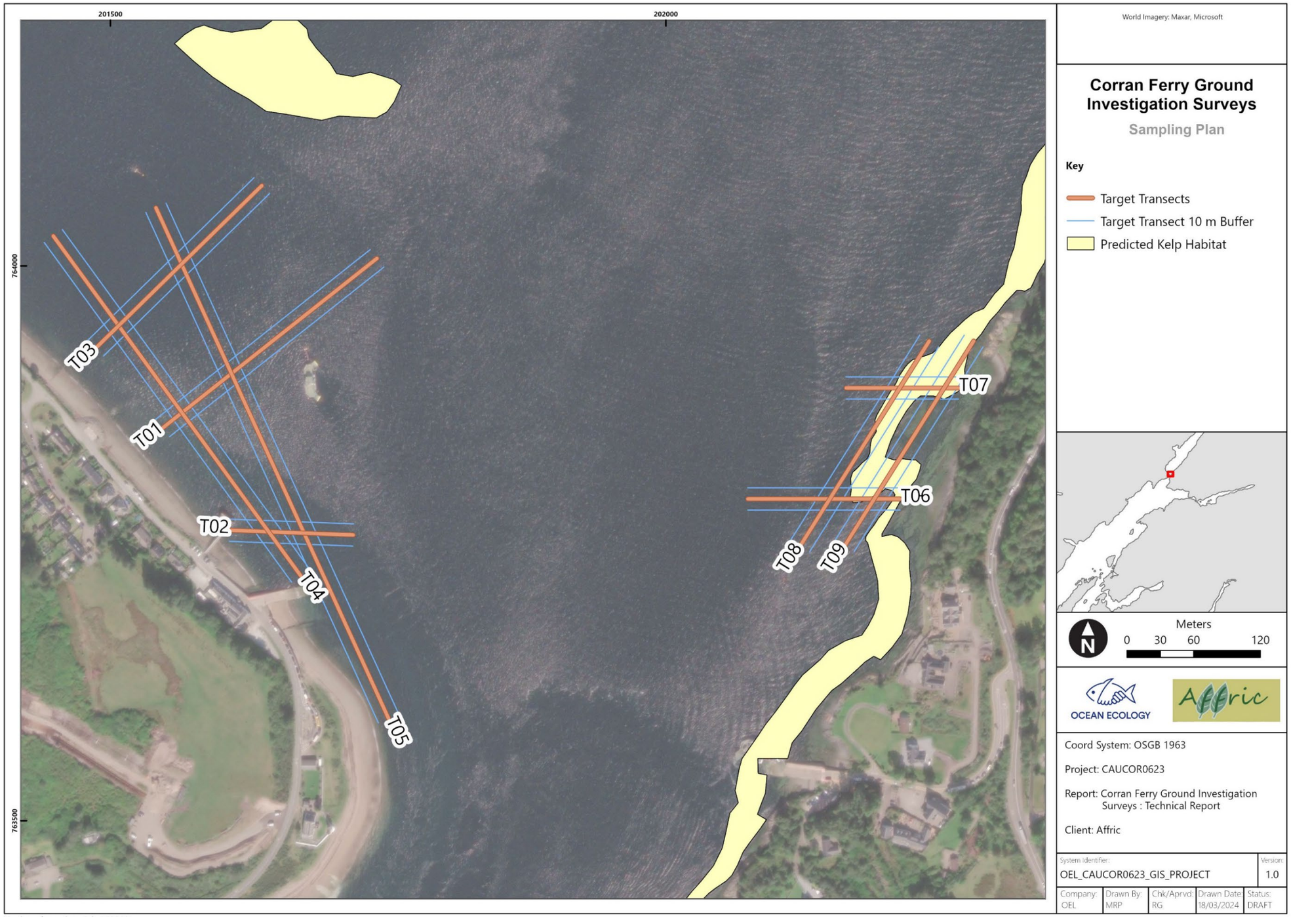

Figure 1 Overview of The Corran Ferry survey area, including the target transects and the target transect buffers (10 m either side).

2. Current Understanding

2.1. Priority Marine Features

Priority Marine Features (PMFs) are habitats and species that are considered to be marine nature conservation priorities in Scottish waters (Tyler-Walters et al. 2016). The following PMF habitats have been recorded within or near to the project site.

Kelp Beds

The kelp *Laminaria hyperborea* is commonly found around the coast of Scotland and its islands in shallow waters (to a maximum of 20-30m) and it can form forests and parks in rocky coastal areas, under a variety of wave and tidal conditions. The kelp provides a canopy under which a wide range of animals and other seaweeds can thrive. The rocks below the kelp are often encrusted with coralline algae or support cushion forming fauna, such as sea anemones, sponges and sea squirts. Small crustaceans and worms live among the kelp, while sea urchins and sea snails graze on the seaweeds, and fish find shelter from predators among the fronds. Scotland holds a significant proportion of the UK records of kelp beds and therefore the habitat is considered to be nationally important. Threats to this habitat include activities that alter wave exposure or tidal flow. Observations of this habitat within the survey area have been reported as European Nature Information System (EUNIS) biotope A3.2131 '*Laminaria hyperborea* forest and foliose red seaweeds on tide-swept upper infralittoral mixed substrata' and EUNIS classification A5.52 **'**Kelp and seaweed communities on sublittoral sediment' (Figure 2).

Kelp and Seaweed Communities on Sublittoral Sediment

Kelp and seaweed communities on sublittoral sediment represent shallow underwater environments characterized by a variety of seaweeds, including the sugar kelp *Saccharina latissima*, the bootlace weed Chorda filum, and various red and brown filamentous seaweeds. In areas with reduced wave action, algae such as *Phyllophora crispa* may form loose-lying mats on the sediment surface. These habitats foster a diverse array of associated marine life, including burrowing polychaete worms, bivalves, scavenging hermit crabs, regular crabs, starfish, fish, and grazing top shells. These communities are exclusive to shallow waters, reaching a maximum depth of 20 metres, and can be found on diverse substrates ranging from muddy sands and gravels to cobbles and boulders. They adapt to various environmental conditions. In Scotland, these kelp and seaweed-dominated habitats are notably widespread along the west coast and in sheltered areas of Orkney and Shetland, with occasional records on the east coast. While predominantly recorded in Scotland, this habitat is also found around the British Isles, particularly in the south and west. This diverse underwater habitat, however, is sensitive to factors such as substratum loss, alterations in water flow or wave exposure, and deoxygenation. Pressures on this environment include the impacts of climate change, coastal development, and the effects of bottom trawling.

Preserving these habitats is crucial for maintaining their biodiversity and resilience in the face of various challenges.

Low or Variable Salinity Habitats

Low or variable salinity habitats manifest where sea water and fresh water converge in varying proportions, influenced by tidal fluctuations and inputs from rivers, rainfall, and runoff. Along coastal saline lagoons, for instance, salinity levels may shift with the tide, resulting in brackish, fully saline, or occasionally hypersaline conditions. These habitats, characterized by less diversity compared to fully marine or freshwater environments, are often dominated by resilient or specialized species. Specialized inhabitants, including certain sea anemones, snails, bivalves, and stoneworts, may be particularly rare and restricted to saline lagoons or habitats with variable salinity. Typically found in estuaries, these environments can also occur at the heads of sea lochs and inlets influenced by freshwater runoff or within saline lagoons. In Scotland, low or variable salinity habitats are widespread on the west coast, the Outer Hebrides, Orkney, and Shetland, with fewer occurrences documented on the east coast. These habitats are distributed throughout the UK, especially in estuaries and coastal waters affected by freshwater runoff and are particularly concentrated in areas with low-lying land near estuaries, notably in parts of England. Scotland's diverse coastline plays a significant role in supporting a substantial portion of these habitats within the broader UK context. However, they face threats from activities altering water flow and salinity regimes, such as coastal development, land reclamation, and water abstraction. Additionally, these habitats are vulnerable to sea-level rise and pollution. Saline lagoons, in particular, are fragile and rare, susceptible to extreme weather events like storms, which can obliterate small lagoons formed by sediment barriers. Preservation efforts are crucial to safeguard the integrity of these unique and sensitive ecosystems.

Tide-Swept Algal Communities

Tide-swept algal communities thrive on bedrock and mixed substrata, shaped by robust tidal currents and dominated by expansive seaweeds like fucoids and kelps. These seaweeds form either dense forests or scattered parks, creating a canopy that offers shelter to an understorey of diverse flora and fauna, including foliose red seaweeds, sea squirts, sea mats, and sea firs. Some species even grow directly on the seaweeds. The bedrock or boulders below provide essential habitats for various marine life, such as limpets, winkles, dog whelks, tube worms, sponges, crabs, and starfish. This habitat thrives in sheltered to wave-exposed tidal channels, often positioned at the entrance of or near sea lochs, between coastal islands, or between islands and the mainland where tidal flow is channelled by the coastline's contours. Ranging from the mid shore down to depths of 30 meters, these communities can adapt to both full and variable salinity conditions. In Scotland, tide-swept algal communities have been recorded in various locations, including the west coast (e.g., the Strait of Corryvreckan and the Falls of Lora), the Outer Hebrides (e.g., the Sound of Harris), Orkney (e.g., Eynhallow Sound), and Shetland (e.g., the Narrows). This habitat is

widely distributed around the UK and Ireland, with a notable concentration on the west coast. However, these communities face potential threats. The harvesting of kelp and wrack components may impact habitat structure and species diversity. Additionally, any activities that reduce water flow, such as coastal development or the installation of renewable energy devices, can have adverse effects on these dynamic and vital marine habitats. Preserving the natural conditions and water flow is crucial for the sustained health of tide-swept algal communities.

2.2. Potential Annex I Habitats within the Survey Area

Reefs

For the purposes of the European Commission (EC) Habitats Directive, the Interpretation Manual of European Union Habitats – EUR25 (CEC, 2013) defines Annex I 'Reefs' as: *'Reef can be either biogenic concretions*[1] *or of geogenic origin*[2]*. They are hard compact substrata* [3]*on solid and soft bottoms, which arise from the sea floor* [4]*in the sublittoral and littoral zone*[5]*. Reefs may support a zonation of benthic communities of algae and animal species as well as concretions and corallogenic concretions.*

Following this definition, Annex I reef habitats protected under the Habitats Directive can be classified into the following subtypes discussed in detail below:

- Bedrock - encompassing "hard compact substrata", specifically, "rocks (including soft rock, e.g. chalk)" of "geogenic origin";
- Stony - encompassing "hard compact substrata", specifically, "boulders and cobbles (generally >64 mm in diameter" of "geogenic origin";
- Biogenic (encompassing "biogenic concretions").

The following reef habitats have been recorded within or near to the survey area.

Bedrock Reef

Annex I bedrock reef habitat occurs where soft (e.g., clay) or hard bedrock arises from the surrounding seabed, providing a stable habitat for attachment for a diverse range of epibiota. Bedrock reefs and associated biological communities can be highly variable due to the diverse

[1] concretions, encrustations, corallogenic concretions and bivalve mussel beds originating from dead or living animals, i.e. biogenic hard bottoms which supply habitats for epibiotic species.
[2] reefs formed by non-biogenic substrata.
[3] rocks (including soft rock, e.g. chalk), boulders and cobbles (generally >64 mm in diameter). Such hard substrata that are covered by a thin and mobile veneer of sediment are classed as reefs if the associated biota are dependent on the hard substratum rather than the overlying sediment.
[4] the reef is topographically distinct from the surrounding seafloor.
[5] the reefs may extend from the sublittoral uninterrupted into the intertidal (littoral) zone or may only occur in the sublittoral zone, including deep water areas such as the bathyal. Where an uninterrupted zonation of sublittoral and littoral communities exist, the integrity of the ecological unit should be respected in the selection of sites.

nature of these habitats in terms of topography, structural complexity and exposure to tidal streams. In the photic zone communities associated with bedrock reefs are often dominated by attached algae, and often support various invertebrate species such as corals, sponges and sea squirts.

These epibiotic communities further increase structural complexity and represent key prey items that in turn attract more mobile and commercially valuable species such as fish and crustaceans.

Stony Reef

Stony reef habitats occur when stable hard substrata, namely cobbles and boulders > 64 mm in diameter arise from the surrounding habitat, creating a habitat colonised by a variety of species (Golding et al., 2020b; Irving, 2009a). Numerous Special Area of Conservation (SAC) sites have been designated in European waters to protect stony reef habitats and associated communities. Reefs are in many cases hot spots for the biodiversity supporting assemblages of various coral, sponges, ascidians, fish and crustaceans. These associated communities vary dramatically according to environmental variables and may incorporate species that occupy a range of trophic levels. The complexity of habitat created by stony reefs often supports a higher abundance of mobile fauna such as echinoderms and various crabs, hermit crabs, and squat lobsters, as well as fish species for which these species represent key prey items.

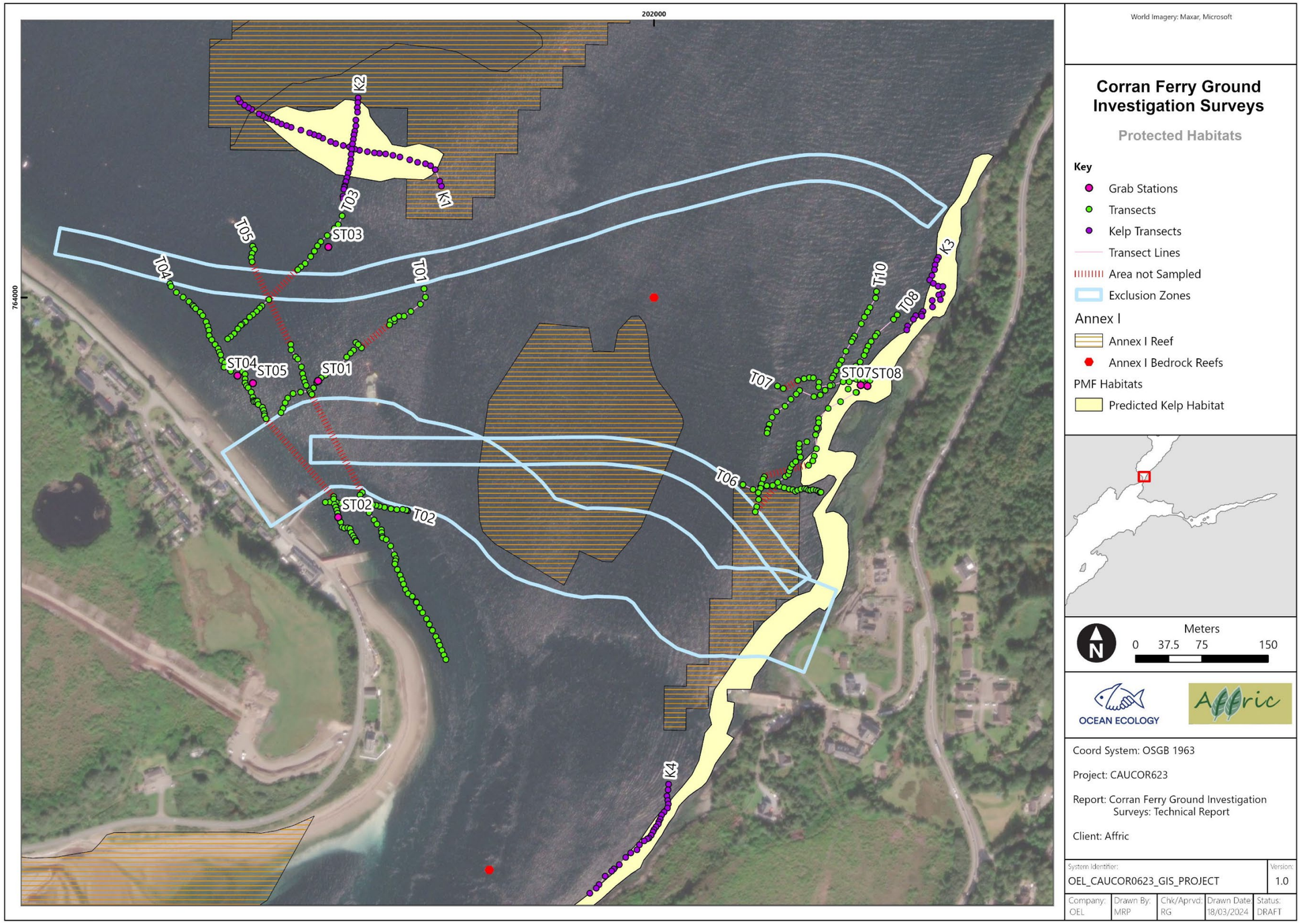

Figure 2 PMF, Annex I habitats occurring within and in the vicinity of the survey area and updated survey design including Kelp transects and grab sampling stations.

3. Survey Design

The sampling strategy was designed to provide a detailed account of the seabed to design a new ferry infrastructure for electric vessels on the Corran Ferry route. The sampling plan included DDC transects and grab samples, with four transects specifically aimed at targeting kelp beds (Figure 2). Nine transects were proposed prior to the survey taking place, while transects to target kelp beds and grab samples were planned while on survey in liaison with the Affric representative.

Below is a summary of the overall survey scope:

- Eight (T01 to T08) of the 9 proposed transects were sampled as planned; however,
- Due to shallow waters close to shore, Transects T06 and T07 were extended on the deeper end to achieve the proposed length of the target transect.
- T09 was inaccessible as it was positioned on an intertidal area and T10 was undertaken as a replacement transect.
- Seven stations were added for grab sampling as advised from the client representative on board.
- Potential kelp beds were identified in the field and K1-K4 transects were added to determine the extent of kelp beds in the area.

3.1. Timings

The vessel was mobilised on the 19th November 2023 and the survey completed between 19th and 21st of November 2023. The vessel operated out of Corran and was demobilised on 22nd of November 2023.

4. Survey Methods

4.1. Survey Navigation

The vessel was equipped with a Hemisphere V200s GPS Compass system that provided an offset position of the sampling equipment when deployed from the stern A frame. This provided a GPS feed to a dedicated survey navigation PC operating EIVA NaviPac. An offset was used to estimate subsea position of the equipment from the point of deployment on the vessel.

4.2. Project Parameters

Table 1 Datum parameters

Parameter	Details
Name	OSGB 1936
Ellipsoid	Airy 1830
Semi-Major Axis (a)	6377563.396
Semi-Minor Axis (b)	6356256.909237285
Inverse Flattening	299.3249646
Geodetic parameters EPSG Code	7022 4277

Table 2 Projection Parameters**.**

Parameter	Universal Transverse Mercator (UTM)
Central Meridian	-2.0
Latitude of Origin	49.0 °
False Easting	400000.0 m
False Northing	-100000.0 m
Scale Factor at Central Meridian	0.9996012717
Projected coordinate system EPSG code	British National Grid OSGB 1963
Units	Meters

4.3. Drop Down Camera (DDC)

Seabed imagery was collected using OEL's DDC system (Plate 1) to collect high definition (HD) video and high-resolution (up to 24 megapixels (MP)) still images at each targeted station. The camera system consisted of a SubC Rayfin camera was mounted in a Clear Liquid Optical Chamber (CLOC) (otherwise known as a 'freshwater lens') filled with fresh water to ensure imagery of suitable quality was obtained (Jones et al., 2020). Two RovTech light emitting diode (LED) strip lights with two 5 kW green dot lasers (set to 10 cm distance for scale), a 300 m umbilical and topside computer. The camera was powered with the use of an Uninterruptable Power Supply (UPS) to ensure no damage was caused should the vessel lose power or cause a power surge. The CLOC was height and angle adjustable providing a variety of options for view, lighting, and focal length to maximise data quality with respect to prevailing conditions at each station (e.g., high turbidity). Following an *in situ* review of seabed imagery, adjustments to the lighting angle were made to improve illumination across the centre of the field of view.

4.3.1. DDC Sampling

The DDC was deployed from the vessel's crane with a data umbilical run through a secondary block mounted from the crane boom. The DDC was lowered to the seabed over the target transect start location and slowly 'flown' just above the seabed to obtain continuous video footage where water clarity was sufficient. Still images representative of each target location were captured by landing the frame on the seabed. The camera was kept as close to the seabed as possible to gain a clear image where possible, while also being high enough in the water column that accidental collisions with the seabed did not occur.

All seabed imagery was collected in consideration of the JNCC epibiota remote monitoring operational guidelines (Hitchin et al., 2015). Video was captured throughout the duration of the transect and high resolution still images were captured at regular intervals (5-10m) with all video footage was reviewed *in situ* by OEL's environmental scientists and the Affric representative.

Full DDC survey logs are presented in Appendices I and II.

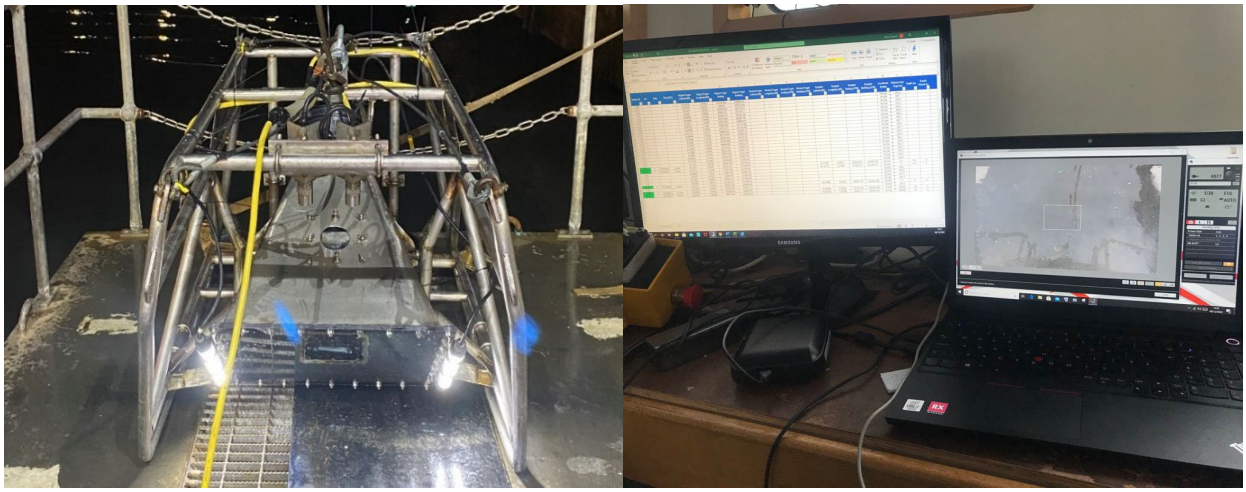

Plate 1 Left: OEL CLOC camera system. Right: The camera system topside setup.

4.4. Grab sampling

Sediment samples were collected using a 0.1 m^2 Hamon grab (Plate 2).

At each station the grab sampler was deployed to the seabed using the vessel's crane. To ensure consistency in sampling, grab samples were screened by the lead environmental scientist and considered unacceptable if:

- The sample was less than 5 L. i.e., the sample represented less than half the 10 L capacity of the grab used.
- The jaws failed to close completely or were jammed open by an obstruction, allowing fines to pass through (washout or partial washout).
- The sample was taken at an unacceptable distance from the target location (beyond 20 m).

In the case of a suitable sample not being collected after three attempts within 20 m of the target sampling locations, the sampling location was to be moved up to 50 m from the original target location. If the location was within proximity to subsea infrastructure, the vessel was to be moved in the opposite direction to the hazard. If samples of less than 5 L were continually achieved, these samples were to be assessed on-site to establish if the sample volume was acceptable to allow subsequent analysis. No pooling of samples was undertaken. If no samples were acquired from the first 4 attempts, then the station was to be abandoned. Full grab survey logs and photos of samples are provided in Appendices III and IV.

4.4.1. Grab Sample Processing

- Initial visual assessment of sample size and acceptability made.
- Photograph of the sample with station details taken in grab and once released.
- Sample emptied onto 0.5 mm sieve net laid over 4.0 mm sieve table and washed through using gentle rinsing with seawater hose.
- Sample backwashed into a suitable sized sample container and diluted 10 % formalin solution added to fix the sample prior to laboratory analysis.
- Sample containers clearly labelled internally and externally with date, sample ID and project name.

Detailed field notes were taken including station number, fix number, number of attempts, sample volume, sediment type, conspicuous fauna, any sign of protected features and water depth.

Plate 2 0.1m^2 Hamon grab used for grab sampling.

5. Laboratory Analysis & Interpretation

5.1. Seabed Imagery Analysis

All seabed imagery analysis collected by DDC was undertaken in consideration of the latest NE Atlantic Marine Biological Analytical Quality Control (NMBAQC)/JNCC Epibiota Quality Assurance Framework (QAF) guidance and identification protocols available on the NMBAQC website. Final datasets are presented using the latest NMBAQC/JNCC epibiota monitoring proformas available for stills and video footage and were quality assured using the QAF form check and comparison tools.

The seabed imagery analysis was undertaken in two stages using the Bio-Image Indexing and Graphical Labelling Environment (BIIGLE) annotation platform (Langenkämper et al., 2017). The first stage, "Tier 1", consisted of labels that refer to the whole image being assigned providing appropriate metadata for the image including EUNIS habitat classifications assigned in line with (Parry, 2019). The second stage, "Tier 2", was used for establishing presence/absence of key epibiotic species within each image and to assign percentage cover of key reef attributes.

A full reef habitat assessment (HA) was conducted on all DDC imagery to determine whether habitats met the definitions of Annex I reef habitats as detailed in Table 3 and Table 4. The latest JNCC guidance on the characterisation of 'low resemblance' Annex I stony reef was also considered (Golding et al., 2020). The annotation label tree used during analysis had major headings for each of the reef types. Under each reef type, labels were assigned for each of the categories required to determine whether Annex I reef habitat is present.

Table 3 Characteristics of stony reef (Irving, 2009)**.**

Characteristic	'Reefiness'			
	Not a Reef	Low	Medium	High
Composition (proportion of boulders/cobbles (>64 mm))	<10 %	10-40 % matrix supported	40-95 %	>95 % clast-supported
Elevation	Flat seabed	<64 mm	64 mm - 5 m	>5 m
Extent	<25 m^2	>25 m^2		
Biota	Dominated by infaunal species	>80 % of species present composed of epibiotal species		

Table 4 Characteristics of *Sabellaria spinulosa* reef (Gubbay, 2007).

Characteristic	'Reefiness'			
	Not a Reef	Low	Medium	High
Elevation (cm)	< 2	2 - 5	5 – 10	> 10
Extent (m^2)	< 25	25 – 10,000	10,000 – 1,000,000	> 1,000,000
Patchiness (% Cover)	< 10	10 - 20	20 – 30	> 30

5.1.1. Tier 1 Analysis

The first stage, "Tier 1", consisted of assigning labels that referred to the whole image, providing appropriate metadata for the image. Metadata "Image Labels" included:

- Broadscale Habitat (BSH) type.
- Substrate type (and percentage cover in 10% intervals).
- Bedforms present.
- The presence of any Annex I habitats, FOCI, HOCI and Invasive Non-Native Species (INNS).
- The presence of any visible impacts or other modifiers (such as discarded fishing gear or marine litter (as per the Marine Strategy Framework Directive (MSFD) categories), visible physical damage to the seabed, evidence of strong currents, non-native species, etc.).
- Image quality categories (including "Not Analysable" category).

Depending on the presence of reef, labels also included:

- Extent: As it was not possible to fully determine the extent of reef habitats from a single image alone this label was used to identify areas that were highly unlikely to constitute reef habitats. An example is an image that showed a large boulder being preceded and succeeded by images of unconsolidated sandy sediments.
- Biota: Labels assigned to determine whether epifauna dominate the biological community observed.
- Elevation: Labels assigned depending on reef type. Laser points were used to assist in the assignment of categories.

5.1.2. Tier 2 Analysis

The second stage, "Tier 2", was used to assess epibiotal presence/absence data as "annotations" within each image for visible flora and fauna. This was undertaken as follows:

- Using the BIIGLE Annotation Platform, (detailed below) enumeration of visible taxa was undertaken using point annotation. A single representation of each taxa present was assigned a point to generate presence absence analysis.
- To assist the Tier 1 analysis of reef presence, polygons were drawn at the Tier 2 stage to delineate percentage cover of biogenic and geogenic reef features.

- Identification of any INNS and species non-native to UK waters. Information has also been included on species non-native to the local habitat types (e.g., hard-substrate specialists in a wider sedimentary habitat).

The substratum observed in each still image was recorded as a percentage cover using Collaborative and Annotation Tools for Analysis of Marine Imagery (CATAMI) (Althaus et al., 2015) substratum types where possible.

Determination of sediment type (such as coarse, mixed, sand etc.) was facilitated using the adapted Folk sediment trigon (Long, 2006) incorporated into a sediment category correlation table. Percentage cover of the different substrate types was used to determine and assign EUNIS codes and BSH.

5.2. PSD Analysis

PSD analysis of the sediment samples was undertaken by in-house laboratory technicians at OEL's NMBAQC participating laboratory in line with NMBAQC best practice guidance (Mason, 2022).

Frozen sediment samples were first transferred to a drying oven and thawed at 80°C for at least 6 hours before visual assessment of sediment type. Before any further processing (e.g., sieving or sub-sample removal), samples were mixed thoroughly with a spatula and all conspicuous fauna (>1 mm) which appeared to have been alive at the time of sampling were removed from the sample. A representative sub-sample of the whole sample was then removed for laser diffraction analysis before the remaining sample screened over a 1 mm sieve to sort coarse and fine fractions. The >1 mm fraction was then returned to a drying oven and dried at 80°C for at least 24 hours before dry sieving. Once dry, the sediment sample were run through a series of Endecott BS 410 test sieves (nested at 0.5 φ intervals) using a Retsch AS200 sieve shaker to fractionate the samples into particle size classes. The dry sieve mesh apertures used are given in Table 5.

Table 5 Sieve series employed for PSD analysis by dry sieving.

Sieve aperture (mm)												
63	45	32	22.5	16	11.2	8	5.6	4	2.8	2	1.4	1

The sample was then transferred onto the coarsest sieve at the top of the sieve stack and shaken for a standardised period of 20 minutes. The sieve stack was checked to ensure the components of the sample had been fractioned as far down the sieve stack as their diameter would allow.

The sub-sample for laser diffraction was first screened over a 1 mm sieve and the fine fraction residue (<1 mm sediments) transferred to a suitable container and allowed to settle for 24 hours before excess water syphoned from above the sediment surface until a paste texture was achieved. The fine fraction was then analysed by laser diffraction using a Beckman Coulter LS13 320.

The dry sieve and laser data was then merged for each sample with the results expressed as a percentage of the whole sample. Once data was merged, PSD statistics and sediment classifications were generated from the percentages of the sediment determined for each sediment fraction using Gradistat v9.1 software.

Sediment descriptions are defined by their size class based on the Wentworth classification system (Wentworth, 1922) (Table 6). Sediment data collected across the three replicates were first averaged for each station. Statistics such as mean and median grain size, sorting coefficient, skewness and bulk sediment classes (percentage silt, sand and gravel) were then derived following the Folk classification (Folk, 1954).

Table 6 The classification used for defining sediment type based on the Wentworth Classification System (Wentworth, 1922).

Wentworth Scale	Phi Units (φ)	Sediment Types
>64 mm	<-6	Cobble and boulders
32 – 64 mm	-5 to -6	Pebble
16 – 32 mm	-4 to -5	Pebble
8 – 16 mm	-3 to -4	Pebble
4 - 8 mm	-3 to -2	Pebble
2 - 4 mm	-2 to -1	Granule
1 - 2 mm	-1 to 0	Very coarse sand
0.5 - 1 mm	0 – 1	Coarse sand
250 - 500 µm	1 – 2	Medium sand
125 - 250 µm	2 – 3	Fine sand
63 - 125 µm	3 – 4	Very fine sand
31.25 – 63 µm	4 – 5	Very coarse silt
15.63 – 31.25 µm	5 – 6	Coarse silt
7.813 – 15.63 µm	6 – 7	Medium silt
3.91 – 7.81 µm	7 – 8	Fine silt
1.95 – 3.91 µm	8 – 9	Very fine silt
<1.95 µm	<9	Clay

5.3. Macrobenthic Analysis

All elutriation, extraction, identification, and enumeration were undertaken at OEL's NMBAQC scheme participating laboratory in line with the NMBAQC Processing Requirement Protocol (Worsfold & Hall, 2010) . All processing information and macrobenthic records was recorded using OEL's cloud-based data management application ABACUS that employs MEDIN validated, controlled vocabularies ensuring all sample information, nomenclature, qualifiers, and metadata are recorded in line with international data standards.

For each macrobenthic sample, the excess formalin was drained off into a labelled container over a 0.5 mm mesh sieve in a well-ventilated area. The samples were then re-sieved over a 0.5 mm mesh sieve to remove all remaining fine sediment and fixative. The low-density fauna was then separated by elutriation with freshwater, poured over a 1 mm mesh sieve, transferred into a Nalgene and preserved in 70 % Industrial Denatured Alcohol (IDA). The remaining sediment from each sample was subsequently separated into 0.5 mm, 1 mm, 2 mm and 4 mm fractions and sorted under a stereomicroscope to extract any remaining fauna (e.g., high-density bivalves not 'floated' off during elutriation).

All fauna present was identified to species level, where possible, and enumerated by trained benthic taxonomists using the most up to date taxonomic literature and checks against existing reference collections. Nomenclature utilises the live link within ABACUS to the World Register of Marine Species (WoRMS) web services to ensure the most up to date taxonomic classifications are recorded. Colonial fauna (e.g., hydroids and bryozoans) were identified to species level where possible and recorded as present (P). For subsequent data analysis, taxa recorded as P were given the numerical value of 1. A full reference collection was retained including at least one example specimen of each taxon.

Biomass was measured as blotted wet weight in grams to at least 4 decimal places for all countable taxa (i.e., at species level where possible). As a standard, the conventional conversion factors as defined by (Eleftheriou & Basford, 1989) was applied to biomass data to provide equivalent dry weight biomass (Ash Free Dry Weight (AFDW)).

The conversion factors applied are as follows:

- Annelida = 15.5%
- Crustacea = 22.5%
- Mollusca = 8.5%
- Echinodermata = 8.0%
- Miscellaneous = 15.5

5.3.1. Data Truncation and Standardisation

The macrobenthic species list was checked using the R package '*worms*' (Holstein, 2018) to check against WoRMS taxon lists and standardise species nomenclature. Once the species nomenclature was standardised in accordance with WoRMS accepted species names, the species list was examined carefully by a senior taxonomist to truncate the data, combining species records where differences in taxonomic resolution were identified.

5.3.2. Pre-Analysis Data Treatment

All data were collated in excel spreadsheets and made suitable for statistical analysis. All data processing and statistical analysis was undertaken using R v 1.2 1335 (R Core Team, 2022) and PRIMER v7 (Clarke & Gorley, 2015) software packages.

In accordance with the OSPAR Commission guidelines (OSPAR, 2004) records of colonial, meiofaunal, parasitic, egg and pelagic taxa (e.g., epitokes and larvae) were recorded, but were excluded when calculating diversity indices and conducting multivariate analysis of community structure. Newly settled juveniles of macrobenthic species may at times dominate the macrobenthos, however the OSPAR (2004) guidelines suggest they should be considered an ephemeral component due to heavy post-settlement mortality and not therefore representative of prevailing bottom conditions (OSPAR, 2004). OSPAR (2004) further states that "Should juveniles appear among the ten most dominant organisms in the data set, then statistical analyses should be conducted both with and without these in order to evaluate their importance". As juveniles of *Abra* and *Spisula* appeared in the top ten of the most dominant taxa across survey area, a 2STAGE analysis was conducted to compare the two data sets (with and without juveniles) which revealed a high level of similarity (~98 %) between the two and therefore juveniles were retained in the dataset for all further analyses and discussion.

In accordance with NMBAQC PRP (Worsfold & Hall, 2010), Nematoda were recorded during the macrobenthic analysis and included in all datasets for all further analyses and discussion.

5.3.3. Univariate Statistics

The vegan package in R Studio (Oksanen et al., 2012) was used to calculate diversity indices for the macrobenthic and epibenthic data including:

- Number of Species (S): the number of taxa present in a sample, with no indication of relative abundances.
- Number of individuals (N): total number of individuals counted.

5.3.4. Multivariate Statistics

Prior to multivariate analyses, data were displayed as a shade plot with linear grey-scale intensity proportional to macrobenthic abundance (Clarke et al., 2014) to determine the most efficient pre-treatment method. Macrobenthic abundance from grab sample data was square root transformed to prevent taxa with intermediate abundances from being discounted from the analysis.

To fully investigate the multivariate patterns in the biotic data, a suite of analytical routines was employed as summarised below and described in detail in Appendix V.

5.4. Determining EUNIS Classifications

Sampling stations were grouped based on their macrobenthic assemblage composition using hierarchical clustering; the SIMPER routine was then applied to identify key and characterising taxa that contributed the most to the similarity within each group. EUNIS classifications were then assigned to each sampling station based on their macrobenthic group and key, characterising taxa as well as based on their sediment type and composition following the latest JNCC guidance (Parry, 2019).

6. Results

6.1. Seabed Imagery Analysis

Digital photographic stills and video footage were obtained at nine DDC transects and four kelp transects across the survey area. This resulted in the collection of 415 still images and 27 videos which were analysed to identify the BSH and biotopes across the survey area. Images were further assessed to inform on the distribution and extent of any protected and/or sensitive habitats and species (e.g., Annex I reef features/ PMFs).

Eight BSHs, four EUNIS Level 4, thirteen EUNIS Level 5, and six EUNIS Level 6 were identified in the seabed imagery collected (Figure 3 to Figure 6, and Table 7). The dominant BSH observed was A5.5, characterised as 'Subtidal Macrophyte Dominated Sediment'. This classification was identified at six DDC transects, and three kelp transects. The most frequently identified EUNIS biotope at these transects was A5.521, described as '*Laminaria saccharina* and red seaweeds on infralittoral sediments', which includes potential PMF habitat 'Kelp and Seaweed Communities on Sublittoral Sediment'. The second dominant BSH observed was A5.4 'Subtidal Mixed Sediment'. This was identified at six DDC transects, and one kelp transect within the survey area. The most commonly identified EUNIS habitat at these transects was A5.43 'Infralittoral mixed sediments'.

DDC video and stills logs are presented in Appendices I and II, respectively. Example imagery is presented in Plate 3

The most common epifauna and macroalgae observed in the seabed imagery for the DDC transects included the tube worms *Serpulidae,* macroalgae including reds (Calcareous), and browns (*Laminaria* sp. and *Saccharina latissima)* and the bryozoan *Electra Pilosa*. For the kelp transects the scene was similar to the one observed for the DDC transects (Plate 4).

Table 7 EUNIS BSH and biotope complexes identified in seabed imagery throughout the survey area.

BSH	EUNIS Code	EUNIS Description
A3.1	A3.115	*Laminaria hyperborea* with dense foliose red seaweeds on exposed infralittoral rock
	A3.116	Foliose red seaweeds on exposed lower infralittoral rock
	A3.125	Mixed kelps with scour-tolerant and opportunistic foliose red seaweeds on scoured or sand-covered infralittoral rock
	A3.126	*Halidrys siliquosa* and mixed kelps on tide-swept infralittoral rock with coarse sediment
A3.2	A3.2121	*Laminaria hyperborea* forest, foliose red seaweeds and a diverse fauna on tide-swept upper infralittoral rock
	A3.2143	Grazed *Laminaria hyperborea* forest with corraline crusts on upper infralittoral rock
	A3.222	Mixed kelp and red seaweeds on infralittoral boulders, cobbles and gravel in tidal rapids
A3.3	A3.3131	*Laminaria saccharina* and *Laminaria digitata* on sheltered sublittoral fringe rock
	A3.322	*Laminaria saccharina* and *Psammechinus miliaris* on variable salinity grazed infralittoral rock
A4.1	-	High Energy Circalittoral Rock
A4.2	A4.2142	*Alcyonium digitatum*, *Pomatoceros triqueter*, algal and bryozoan crusts on wave-exposed circalittoral rock
A5.1	A5.131	Sparse fauna on highly mobile sublittoral shingle (cobbles and pebbles)
A5.4	A5.43	Infralittoral mixed sediments
	A5.445	*Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment
A5.5	A5.5211	Red seaweeds and kelps on tide-swept mobile infralittoral cobbles and pebbles
	A5.5212	*Laminaria saccharina* and robust red algae on infralittoral gravel and pebble
	A5.5213	*Laminaria saccharina* and filamentous red algae on infralittoral sand
	A5.523	*Laminaria saccharina* with *Psammechinus miliaris* and/or *Modiolus modiolus* on variable salinity infralittoral sediment

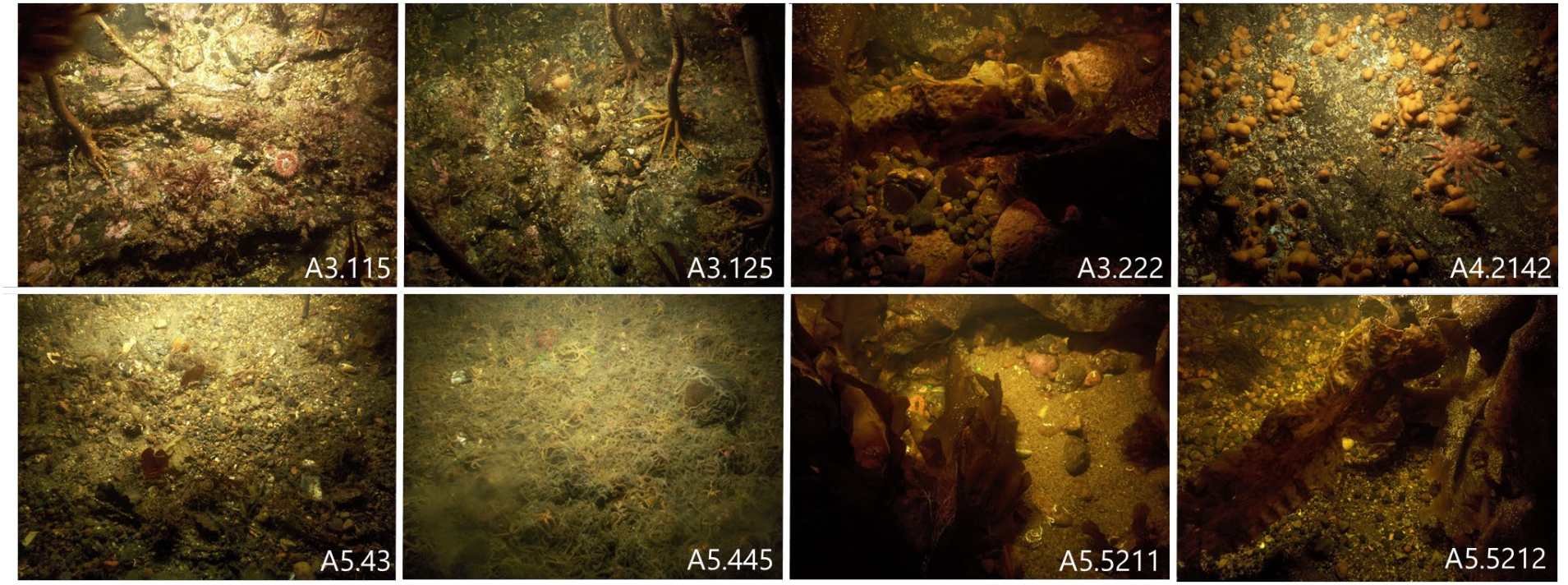

Plate 3 Examples of the most common habitats and biotopes captured via DDC across the survey area. Clockwise from top left: T08, T06, T04, T07, T02, T01, T05, and T04.

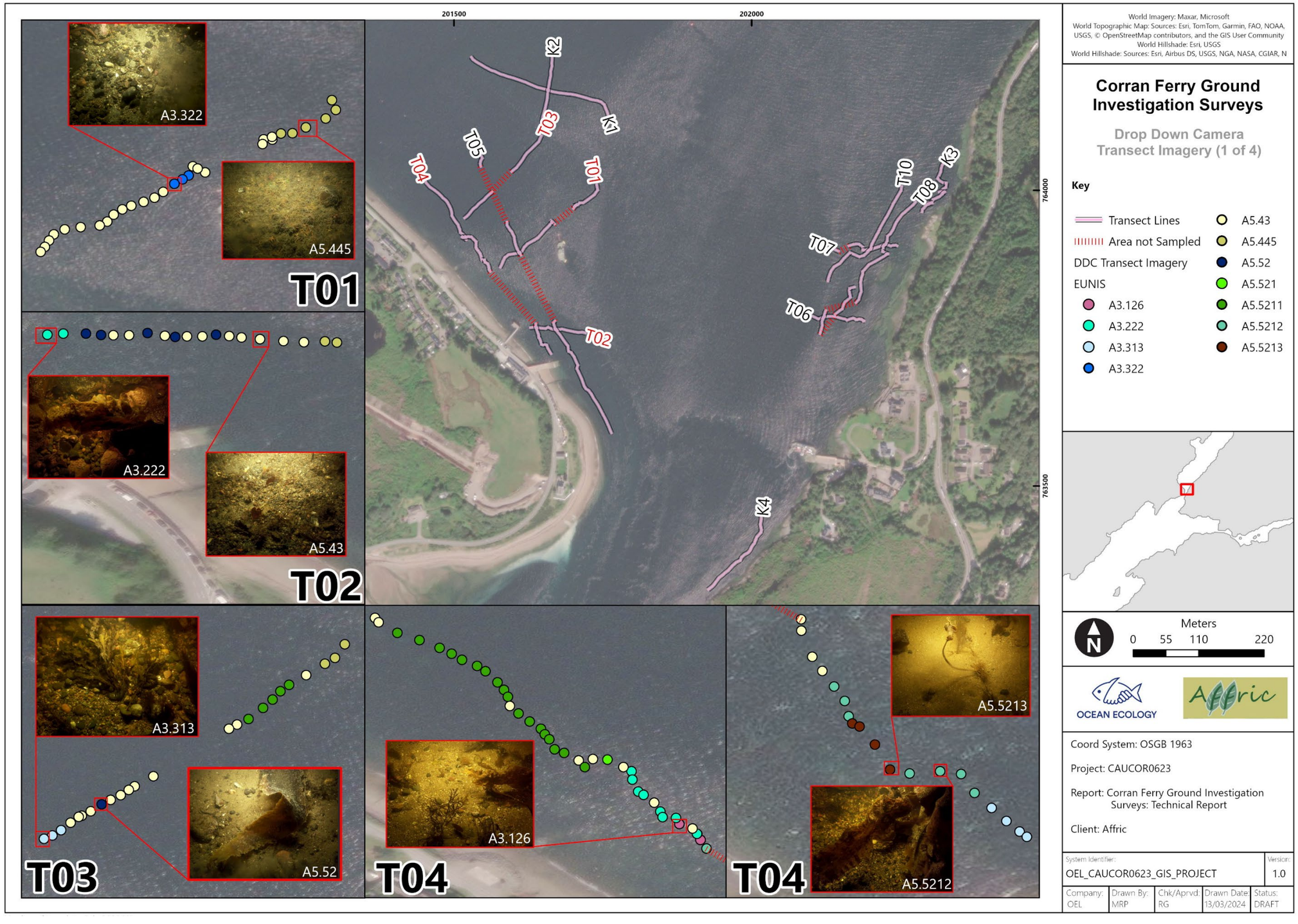

Figure 3 EUNIS classifications derived from seabed imagery collected along transects in the survey area (1 of 4).

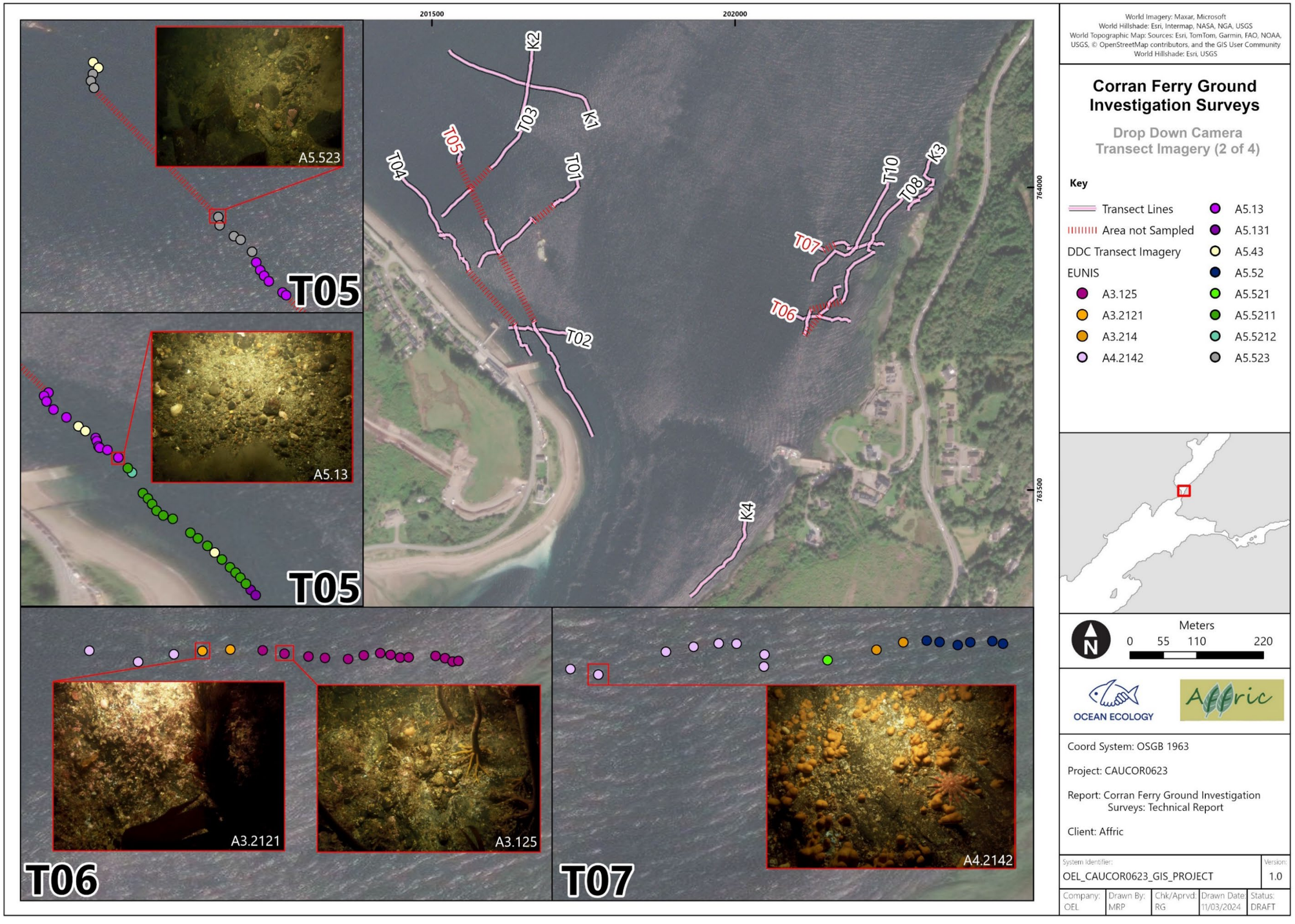

Figure 4 EUNIS classifications derived from seabed imagery collected along transects in the survey area (2 of 4).

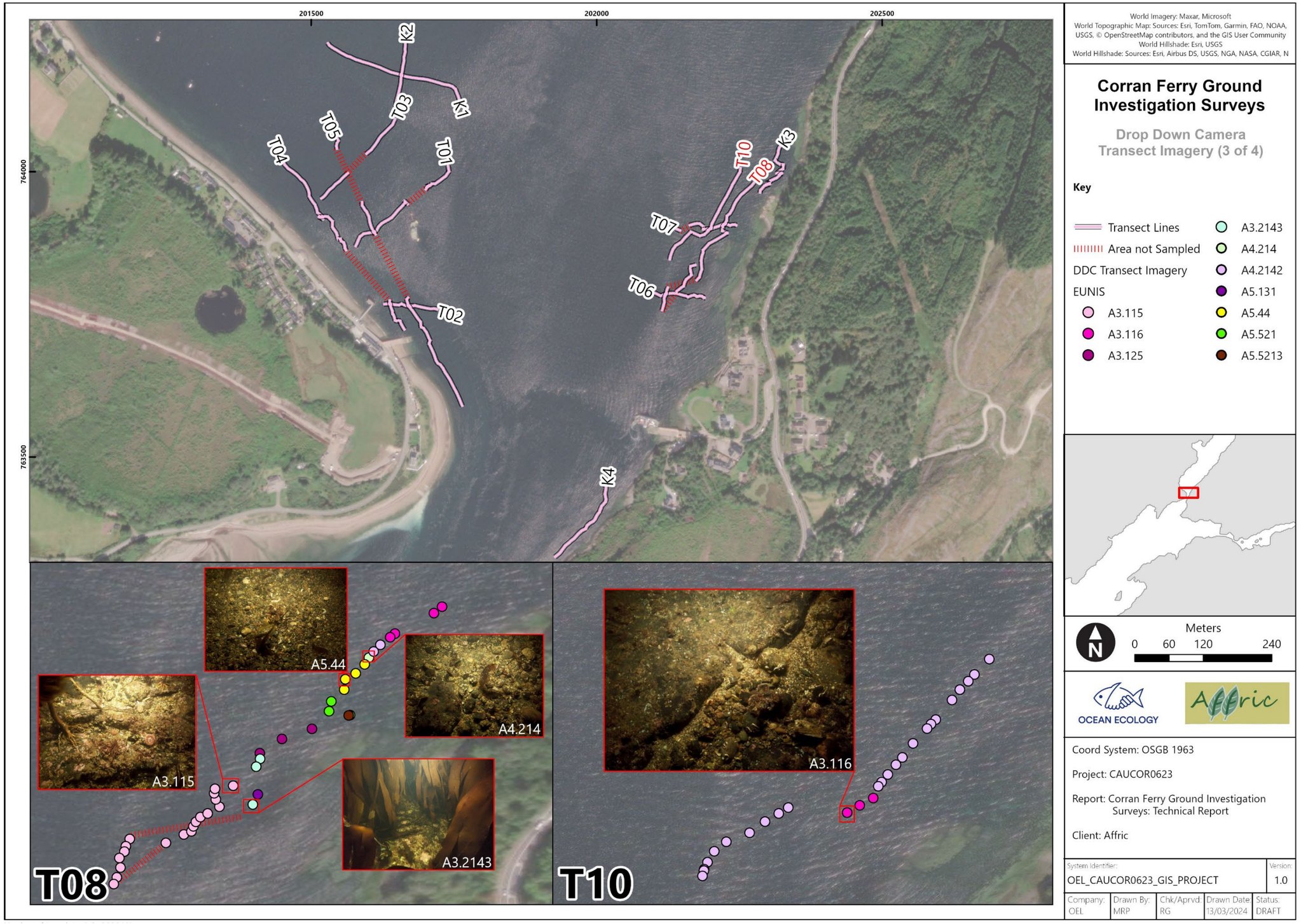

Figure 5 EUNIS classifications derived from seabed imagery collected along transects in the survey area (3 of 4).

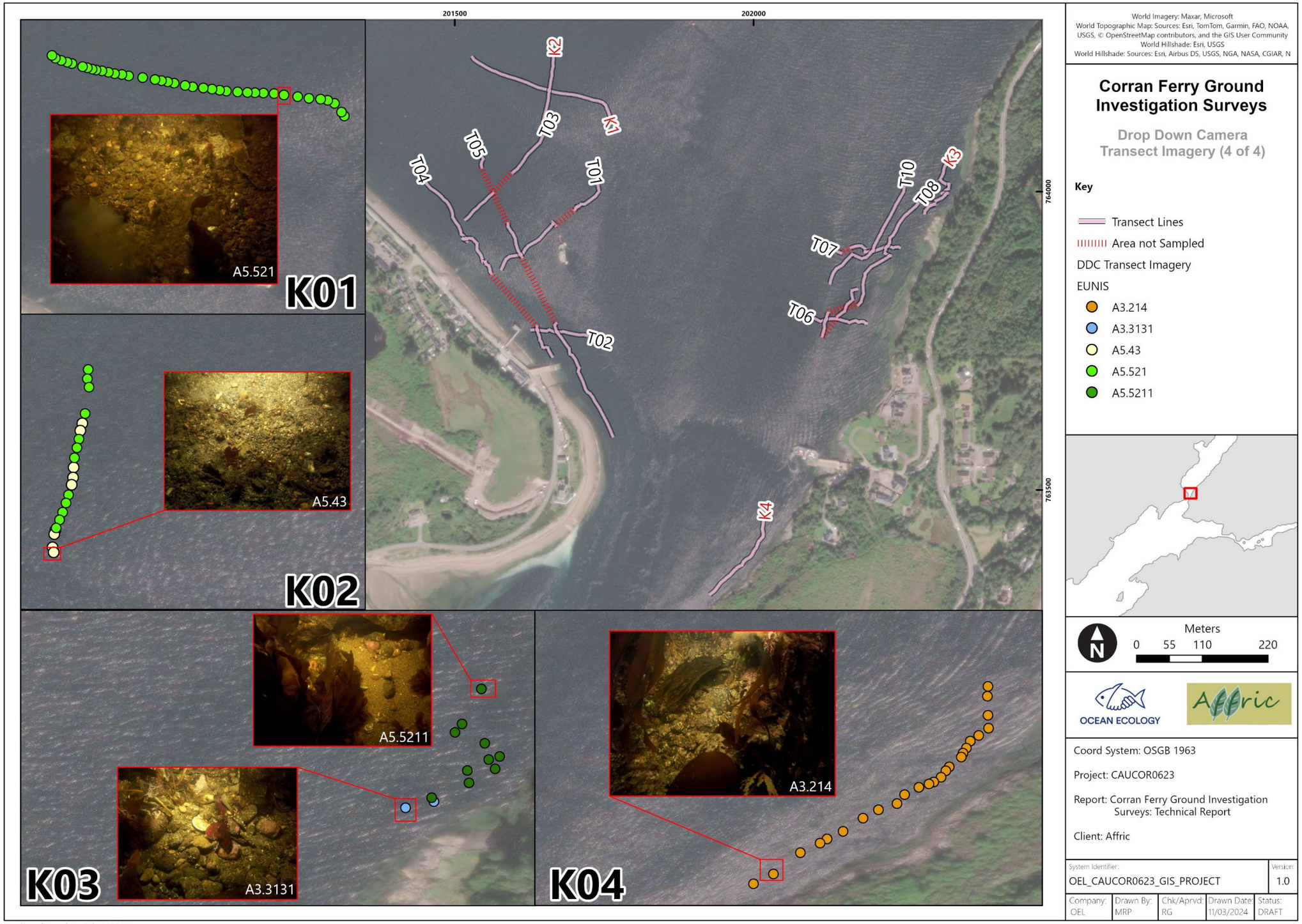

Figure 6 EUNIS classifications derived from seabed imagery collected along transects in the survey area (14 of 4).

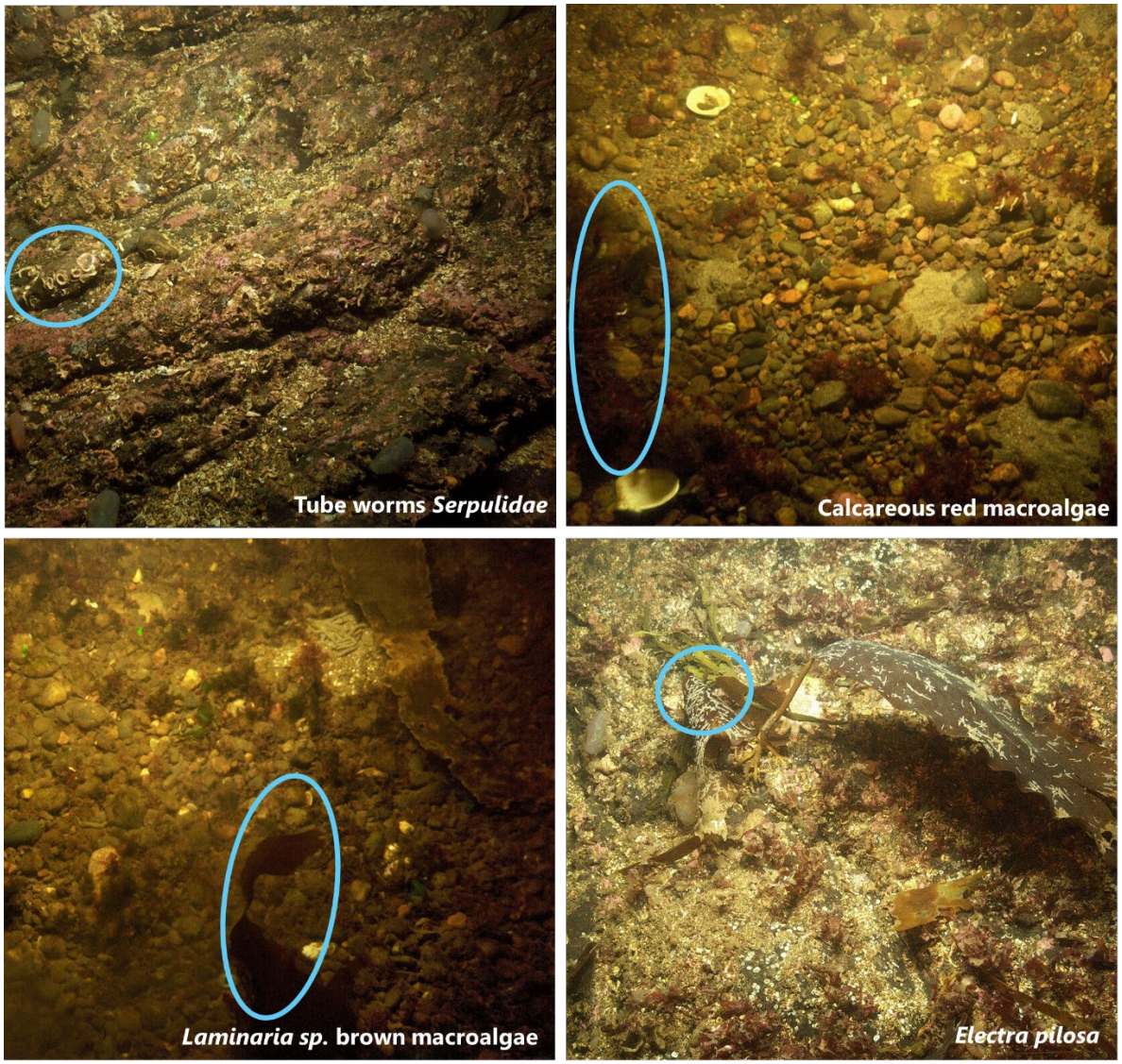

Plate 4 Examples of common epifaunal and macroalgae taxa identified across the survey area. Clockwise from top left: T07, K1, K1 and T10.

6.1.1. Annex I Reef Assessment

A comprehensive Annex I reef assessment was conducted on all imagery (Table 8). Annex I reef was observed within 111 images throughout the survey area (Plate 5).

Table 8 Annex I reef assessment results.

Annex I Reef	Transects	Kelp Transects
Low stony	T04, T05, and T08	K3 and K4
Low stony and bedrock		K4
Bedrock	T06, T07, T08, and T010	K4
Bedrock and low stony	T08	

Results of the Annex I reef assessment are presented spatially in Figure 7 to Figure 8 and full assessment proforma is provided in Appendix VII.

Plate 5 Examples of Annex I reef habitats identified across the survey area. Clockwise from top left: T04, K4, T08, T08.

6.1.2. PMF Assessment

The PMF habitats 'Kelp Beds' and 'Kelp and Seaweed Communities on Sublittoral Sediment' were identified in 52 images for Kelp Beds and 137 images for 'Kelp and Seaweed Communities on Sublittoral Sediment'(Figure 7 to Figure 10, Table 7 and Appendix VI). The biotope A3.322 '*Laminaria saccharina* and *Psammechinus miliaris* on variable salinity grazed infralittoral rock' was identified in three images on Transect T01 and was the biotope component of PMF habitat 'Low or Variable Salinity Habitats'. The biotopes A3.222 'Mixed kelp and red seaweeds on infralittoral boulders, cobbles and gravel in tidal rapids', and A3.126 '*Halidrys siliquosa* and mixed kelps on tide-swept infralittoral rock with coarse sediment' were identified in 12 images from two transects (T02 and T04) and were the biotope components of the PMF habitat 'Tide-Swept Algal Communities' (Plate 6).

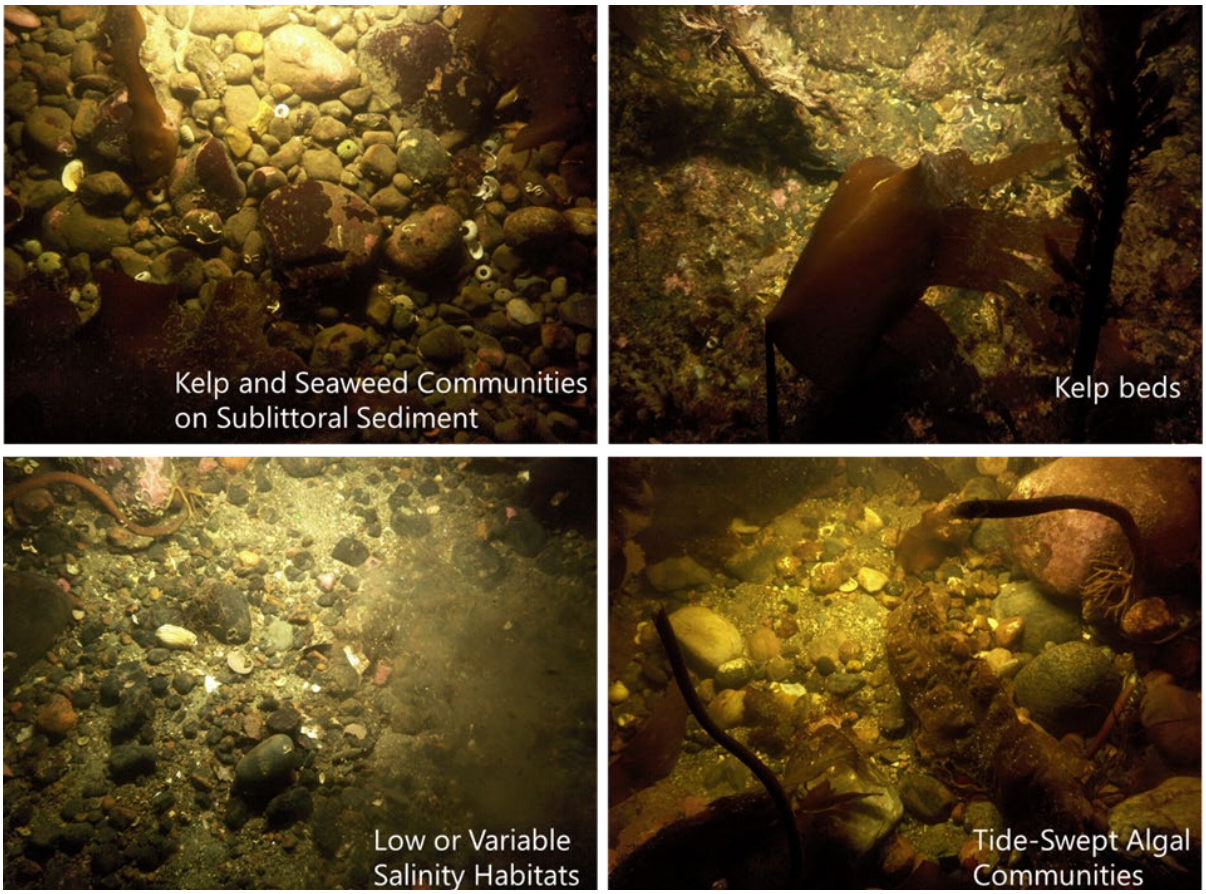

Plate 6 Examples of PMF habitats found across the survey area. Clockwise from top to left: K1, K4, T01, T04.

Table 9 EUNIS BSH and biotope complexes identified in seabed imagery throughout the survey area.

PMF	EUNIS
Kelp and Seaweed Communities on Sublittoral Sediment	A5.52, A5.521, A5.5211, A5.5212, A5.5213, A5.523
Kelp Beds	A3.115, A3.21.21, A3.214, A3.2143
Low or Variable Salinity Habitats	A3.322
Tide-Swept Algal Communities	A3.126, A3.222

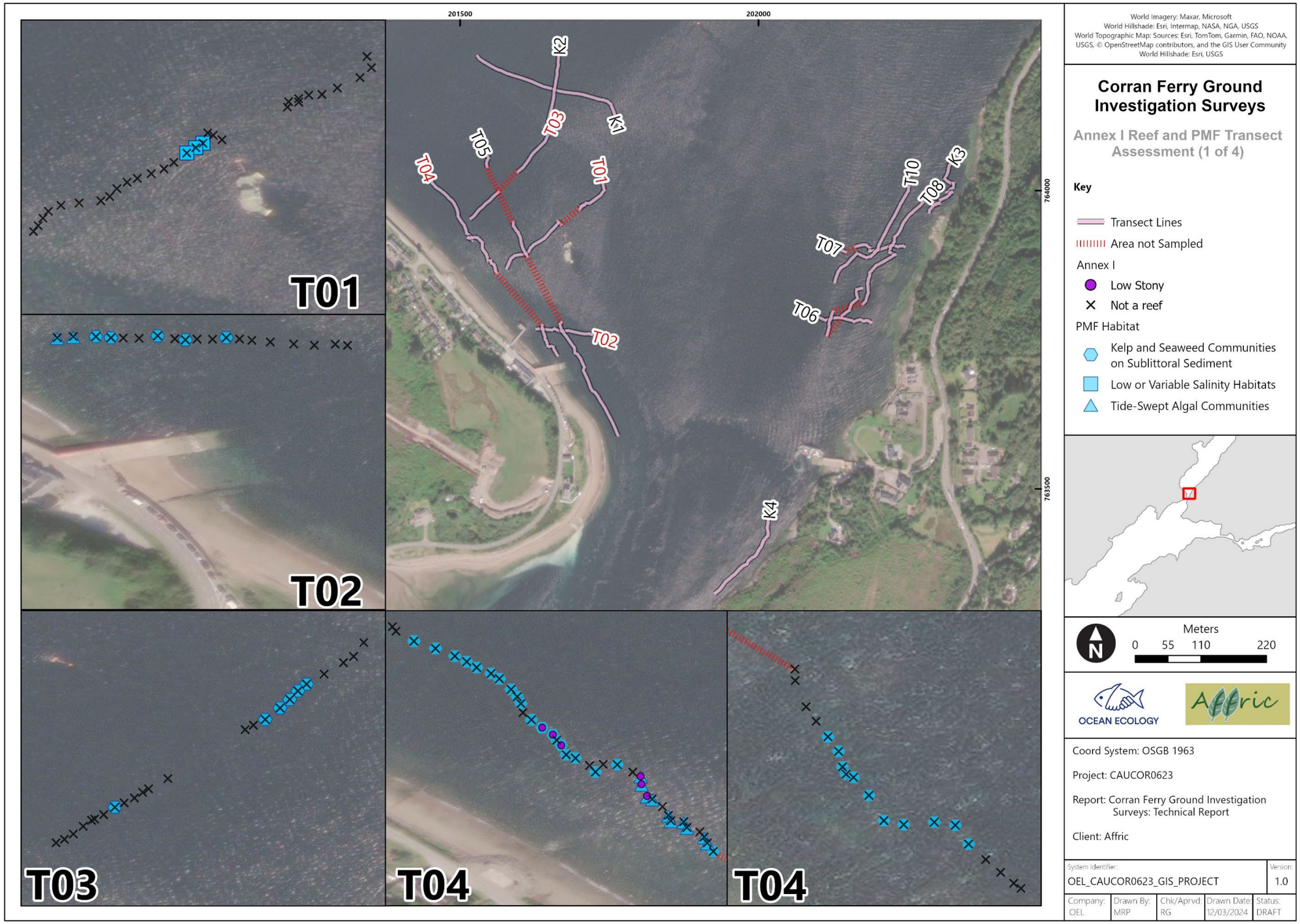

Figure 7 Annex I and PMFs identified in the survey area (1 of 4).

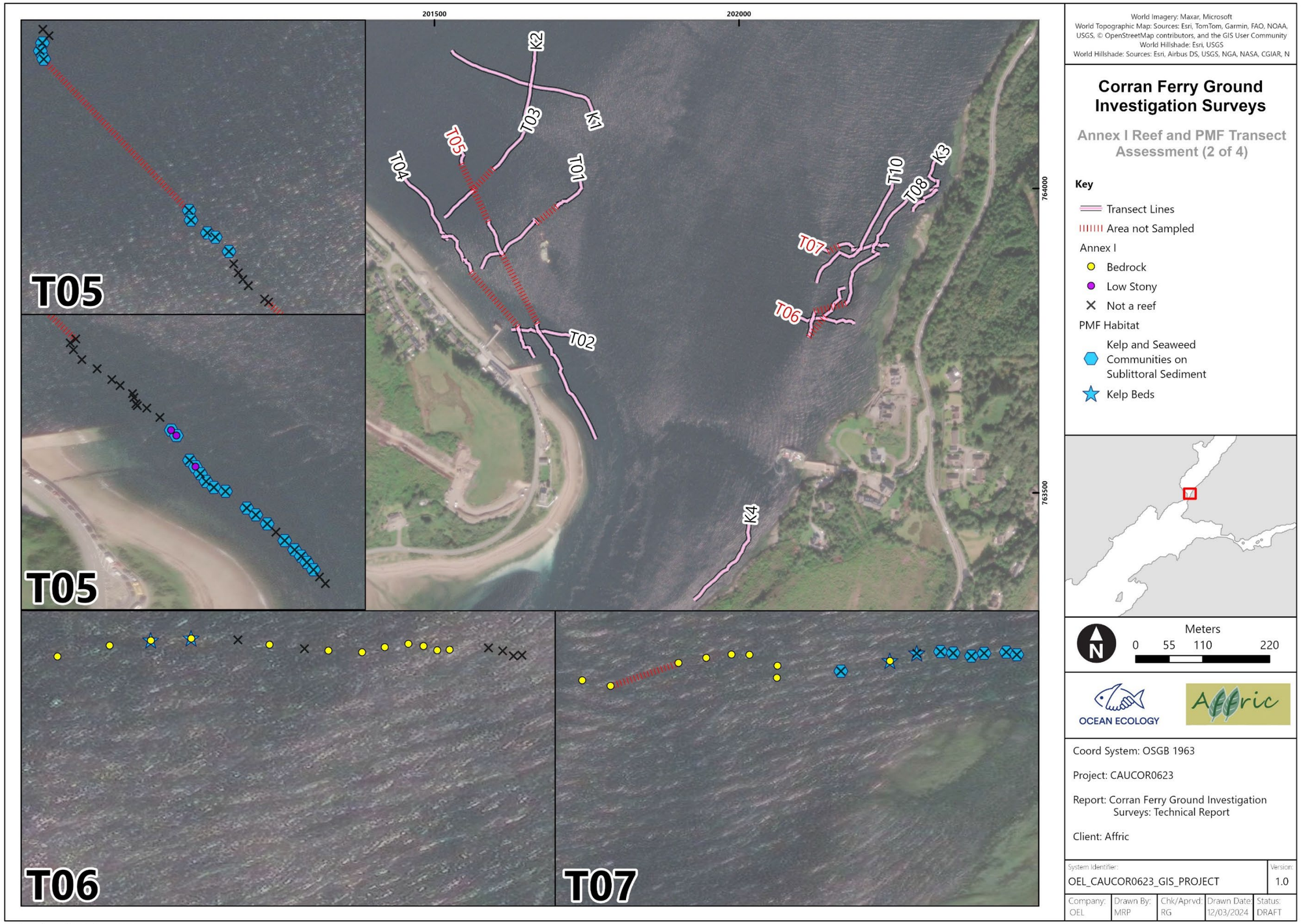

Figure 8 Annex I and PMFs identified in the survey area (2 of 4).

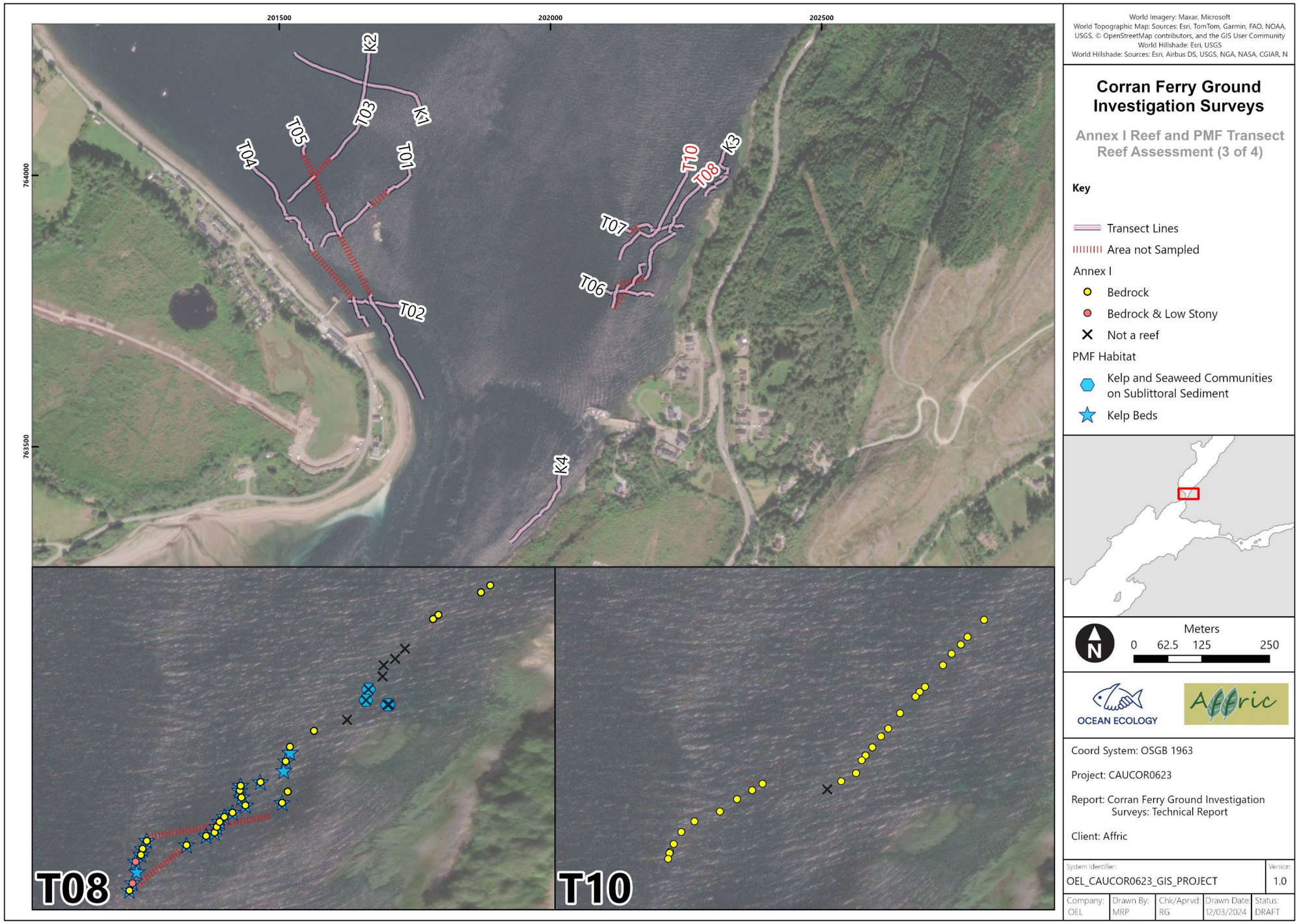

Figure 9 Annex I and PMFs identified in the survey area (3 of 4).

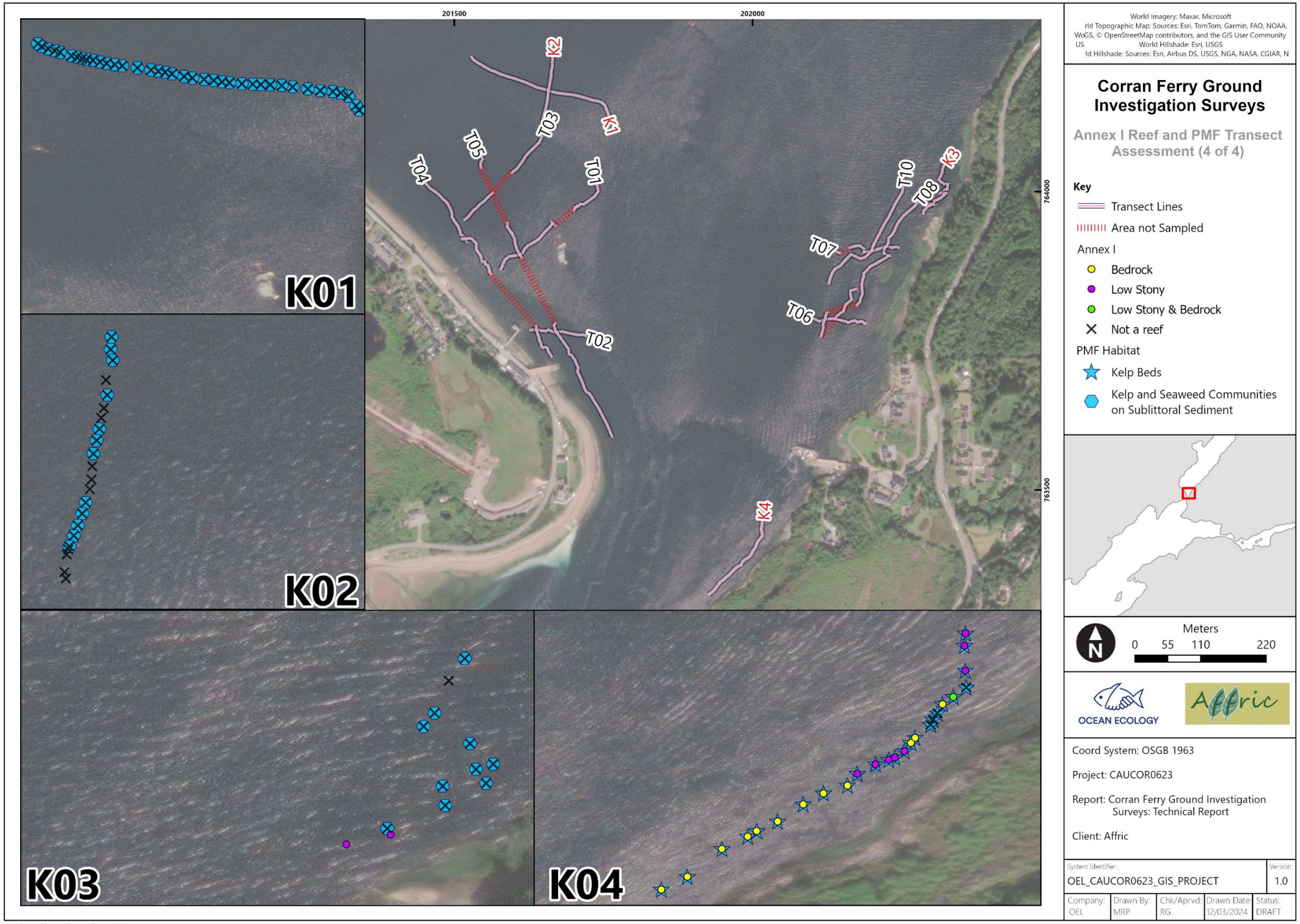

Figure 10 Annex I and PMFs identified in the survey area (4 of 4).

6.2. PSD Data

In total, 7 sediment samples were analysed for full particle size classification. Example images of all sampled sediment types are presented in Plate 7 with full particle size data provided in Appendix VIII and summary data provided in Appendix IX.

6.3. Sediment Type

Sediment types, as classified using the Folk triangle (Folk, 1954) for each station sampled across the survey area are presented in Figure 11. Each Folk classification was converted to BSH type (EUNIS Level 3) using the adapted Folk triangle (Long, 2006). Sediments were heterogeneous across the survey area, characterized by contributions of sand and gravel at all stations, with mud present in minimal quantities. Sediment textural group and BSH are mapped in Figure 12 and Figure 13.

Of the 7 stations sampled, 4 were representative of EUNIS BSH A5.4 (Mixed Sediment), all of which were classified by the textural group Muddy Sandy Gravel (msG). The other three stations were representative EUNIS BSH A5.1 (Coarse Sediment) and included the textural groups Gravelly Sand (gS) and Sandy Gravel (sG) (Figure 11).

6.4. Sediment Composition

Sediment was characterised by a predominance of sand and gravel and varying, generally low mud content across the survey. The percentage contribution of gravels (> 2 mm), sands (63 µm to 2 mm), and fines (< 63 µm) at each station are presented in Figure 13. The mean proportion (± Standard Error, SE) of sands across all stations was 49 % (± 7 %), the mean (± SE) gravel and mud content across the survey area was 45 % (± 7 %) and 6% (± 2 %) respectively. Spatial trends of sediment composition are mapped in Figure 14.

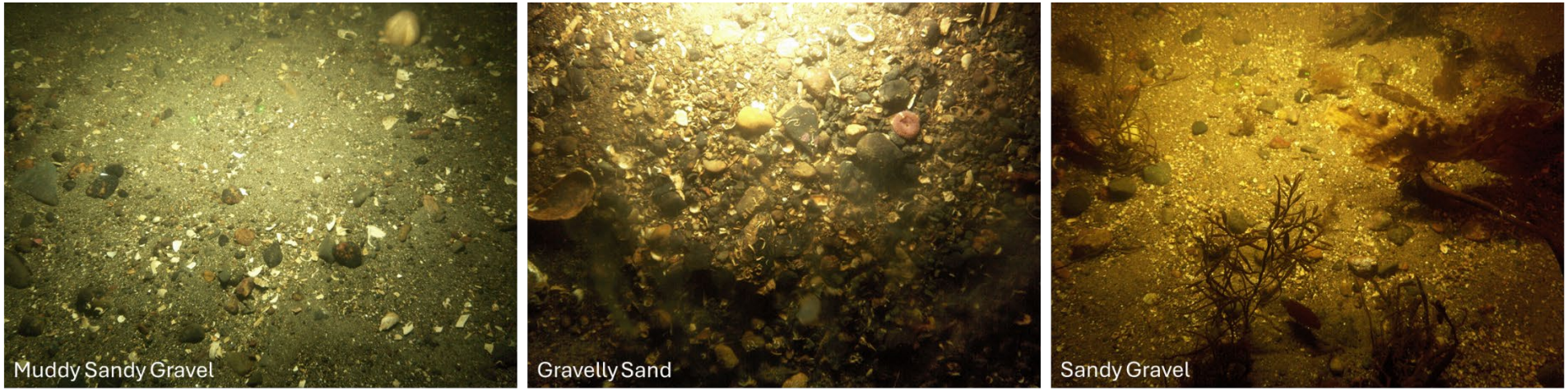

Plate 7 Sediment types sampled. Left to right: ST01, Muddy Sandy Gravel (msG). ST02, Gravelly Sand (gS). ST04, Sandy Gravel (sG).

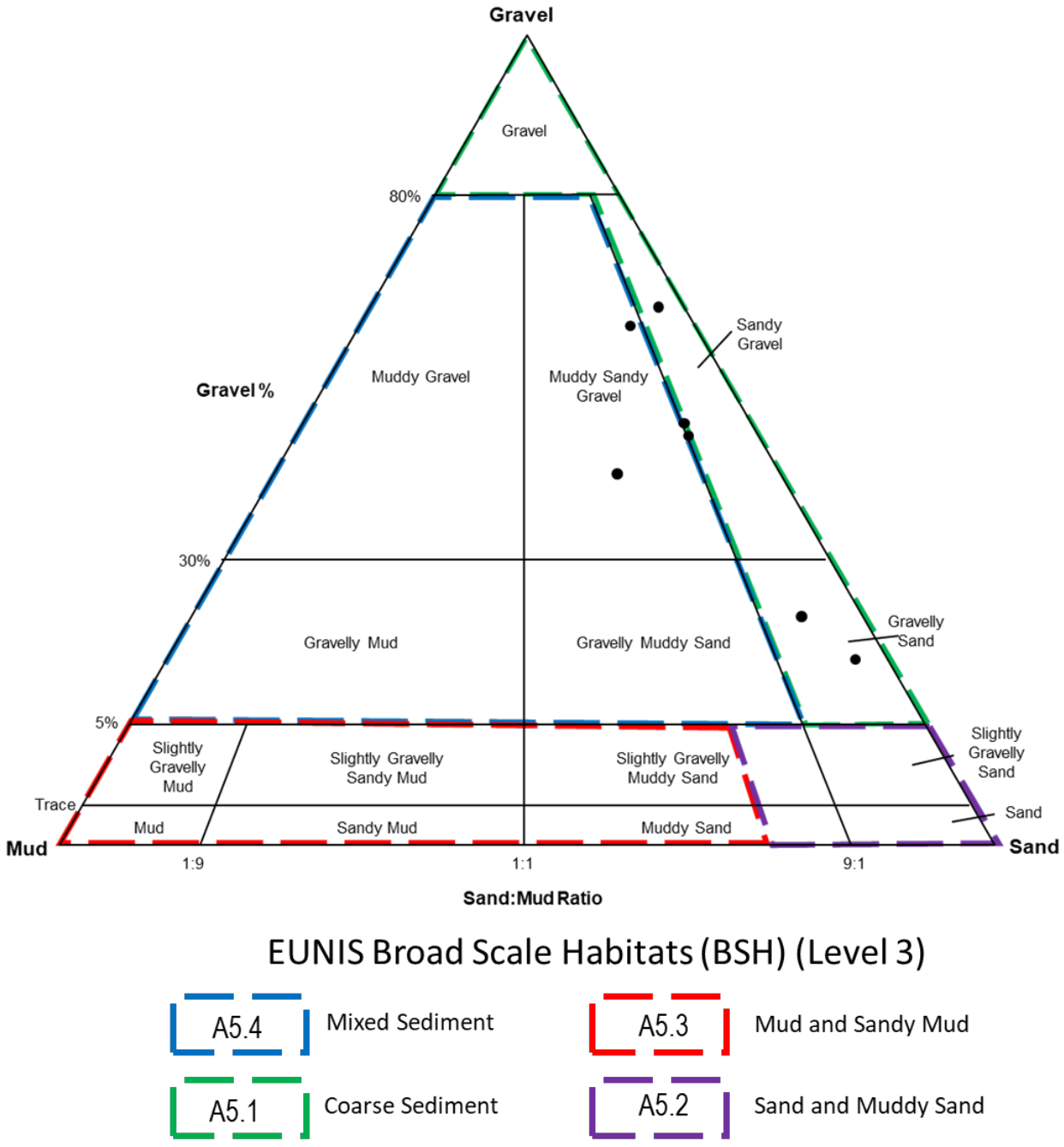

Figure 11 Folk (1954) triangle classifications of sediment gravel percentage and the sand-to-mud ratio of samples collected across the ruptured pipeline subtidal sampling area, overlain by the modified Folk triangle for determination of mobile sediment BSHs under the EUNIS habitat classification system (adapted from (Long 2006)).

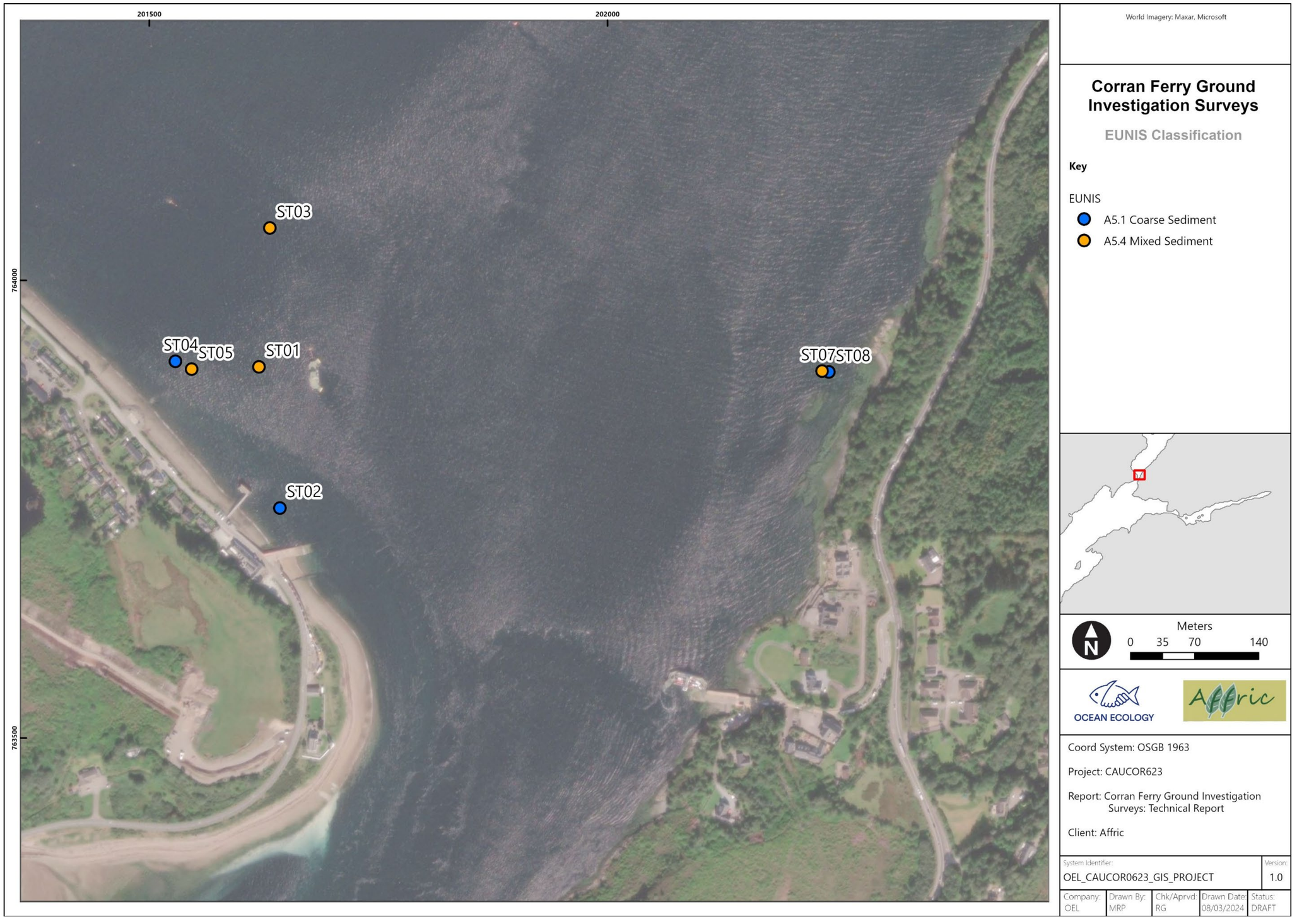

Figure 12 EUNIS BSH classification as determined based on PSD of sampled collected during the survey.

Figure 13 Textural Groups as determined from PSD analysis of samples acquired during the survey.

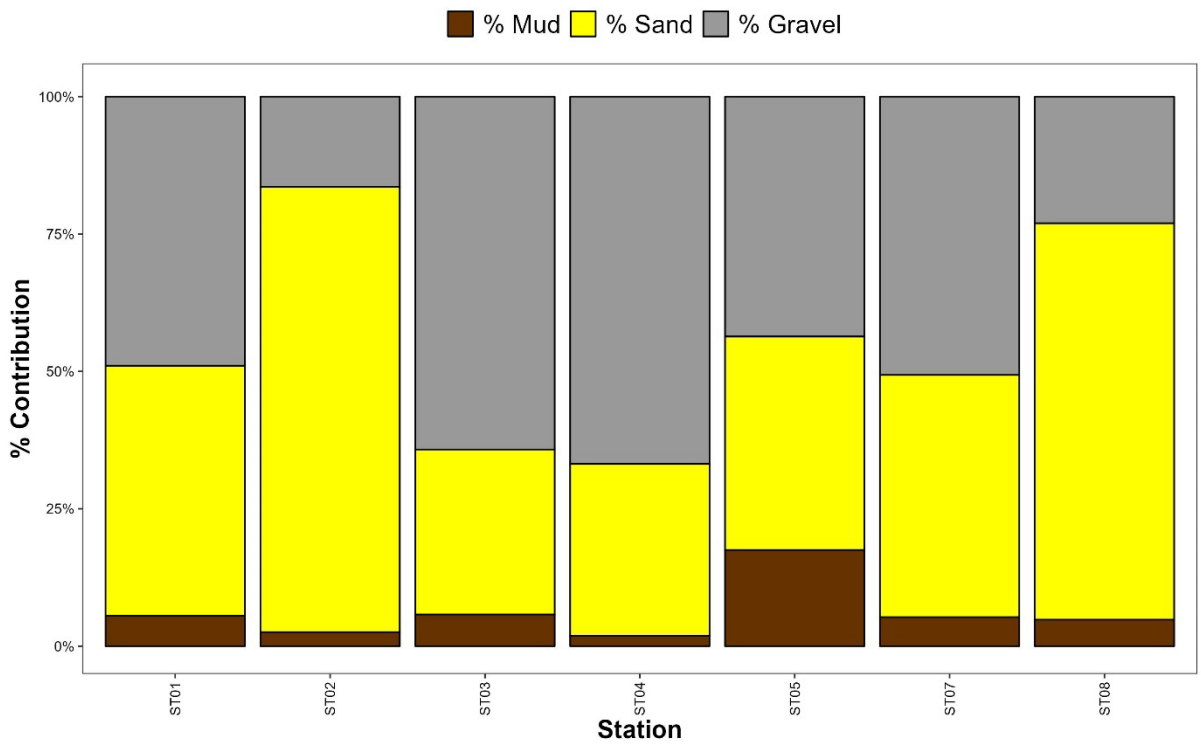

Figure 14 Relative contribution of major sediment fractions (Gravel, Sand, Mud) by volume at each sampling station.

Figure 15 The principal sediment components (Gravel, Sand, Mud) as determined from PSD analysis of samples acquired during the survey.

6.5. Macrobenthic Composition

6.5.1. Univariate analysis

A diverse macrobenthic assemblage was identified across the survey area from the 7 macrobenthic samples collected across the subtidal stations (0.5 mm size fractions) including a total of 3,780 individuals and 185 taxa recorded. The mean (± SE) number of taxa per station was 27 ± 1, mean (± SE) abundance per station was 143 ± 11, and mean (± SE) biomass per station was 0.4189 ± 0.0973 gAFDW (Ash Free Dry Weight).

The full abundance matrix is provided in Appendix X. The biomass (gAFDW) of each major taxonomic group (Annelida, Crustacea, Mollusca, Echinodermata, and Miscellaneous) in each sample collected is presented in Appendix XI.

Figure 16 shows the main infaunal taxa characterising the stations. The phylum Nematoda was the most abundant accounting for 35 % of all individuals recorded. It occurred at all stations and accounted for the maximum abundance per sample and maximum average density per sample. Another key taxon was the polychaete *Pholoe inornata* occurring in 100 % of samples.

Figure 17 illustrates the relative contributions to total abundance, diversity, and biomass of the major taxonomic groups in the macrobenthic community sampled across the survey area. Miscellaneous taxa (in the main driven by high abundances of Nematoda) dominated abundance as they accounted for 38% of all individuals recorded. Biomass was dominated by Mollusca contributing to 59% of the total biomass. Annelid taxa dominated the diversity accounting for 47% of all taxa recorded.

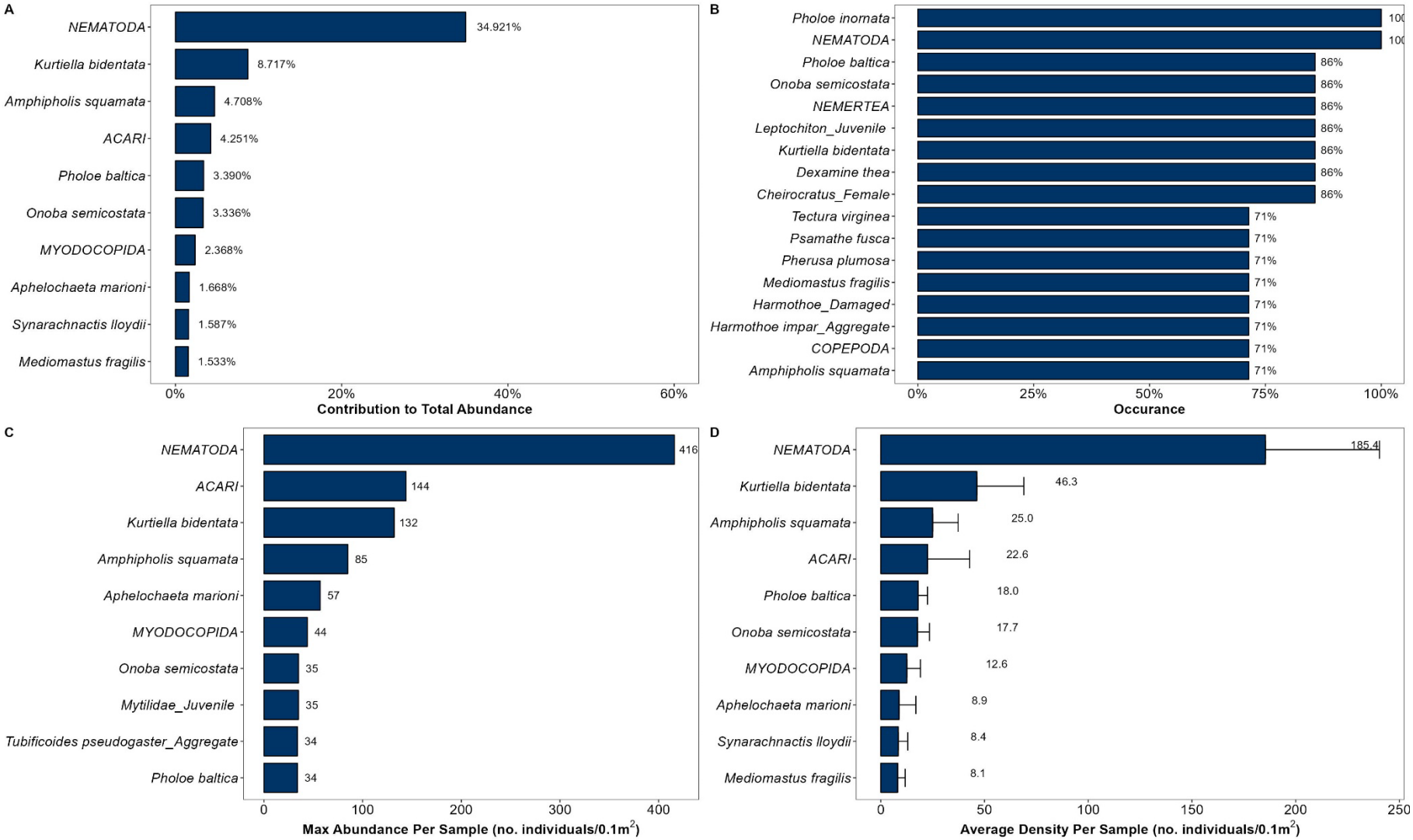

Figure 16 Percentage contributions of the top 10 taxa to total abundance (a) and occurrence (b) from samples collected across the stations. Also shown are the maximum densities of the top 10 taxa per sample (c) and average densities of the top 10 taxa per sample (d).

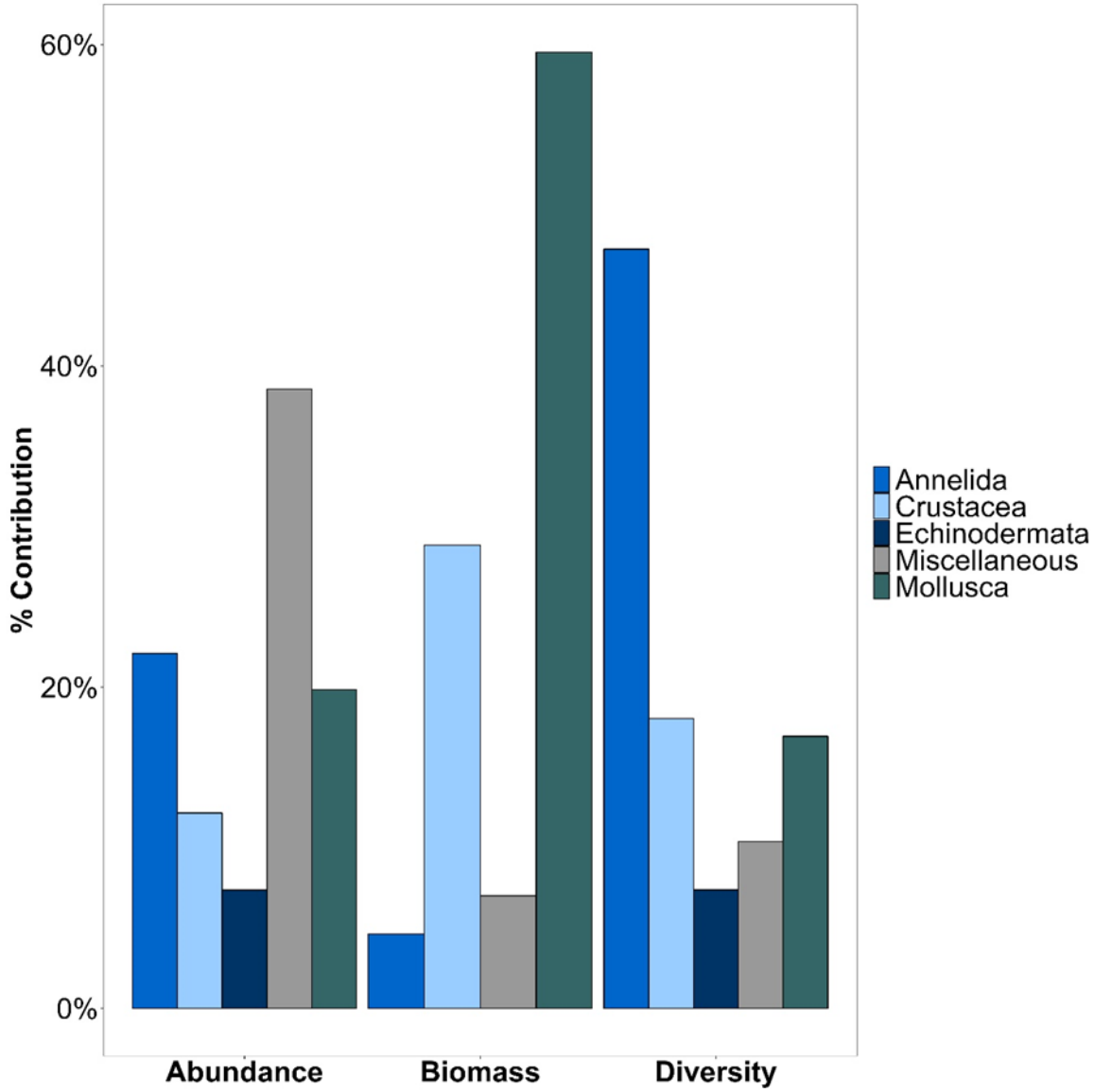

Figure 17 Relative contribution of the major taxonomic groups to the total abundance, diversity, and biomass of the taxa sampled at the survey area.

6.5.2. Notable Taxa

The mollusc *Ceratia proxima* is in the Scottish Biodiversity List of species of principal importance for biodiversity conservation. Eight individuals were recorded and were confined to a single station (ST04).

The arthropod *Crassicorophium crassicorne* and the mollusc *Mya arenaria* are classified as invasive and non-native species. *C. crassicorne* was recorded on three occasions across two stations (ST02 and ST03) and two *M. arenaria* individuals were recorded at ST03.

The Ross warm *S. spinulosa* is a protected species under the OSPAR list of threatened and/or declining species and the Habitats Directive when in reef habitat form. A single individual was recorded at Station ST07.

6.5.3. Macrobenthic Groups

Multivariate analysis was undertaken on the square-root transformed macrobenthic grab abundance data to identify spatial distribution patterns in the macrobenthic assemblages across the survey area and identify characterising taxa present.

Cluster analysis of the macrobenthic data was performed on a Bray-Curtis similarity matrix to analyse the spatial similarities in macrobenthic communities recorded across all sampled stations. The dendrogram resulting from the cluster analysis (Appendix XII) and associated Type 1 SIMPROF similarity (similarity profile routine) permutation test of all nodes within the dendrogram, identified one statistically significantly similar group ($p < 0.05$) including three stations and four outliers. The spatial distribution of this macrobenthic group and outlier stations is presented in Figure 18.

To visualise the relationships between the sampled macrobenthic assemblages, a non-metric multi-dimensional scaling (nMDS) plot was generated on the abundance data (Figure 18). The nMDS represents the relationships between the communities sampled, based on the distance between sample (station) points. The low stress value of the nMDS ordination plot indicates that the two-dimensional plot provides a good representation of the similarity between stations.

SIMPER (similarity percentage analysis) was used to identify the key taxa contributing to the within group similarity of the macrobenthic group recognised; the full SIMPER results are provided in Appendix XIII. Note that only three stations belonged to Macrobenthic Group A, while four stations were stand alone outliers. Of these, ST04 was the only one where the presence of red algae (*Rhodophyta, Corallinaceae*, *Phycodrys ruben)*, the sea moss *Chondrus crispus,* and brown seaweed (*Ochrophyta*) was consistently noted.

Macrobenthic Group A – Three stations belonged to this group: ST01, ST03, and ST05. These stations were characterised by the presence of Nematoda, the brittle star *Amphipholis squamata*, other brittle stars from the genus Myodocopida, the mollusc *Onoba semicostata*, the annelid *Pholoe baltica*, the mollusc *Kurtiella bidentata*, and the anemone *Synarachnactis lloydii* all together contributing to about 75% of the group average similarity of 49.42 %.

Figure 18 Two-dimensional nMDS ordination of macrobenthic communities at the subtidal stations based on square root transformed and Bray-Curtis similarity abundance data.

Figure 19 Spatial distribution of macrobenthic groups as determined from cluster analysis of abundance data.

6.5.4. Biotope Assignment

For the Macrobenthic Group determined using cluster analysis, biotope / habitat were assigned in line with JNCC guidance based upon their faunal and physical characteristics (Parry, 2019). Outlier stations were assigned to the most accurate EUNIS classification possible based on PSA results and seabed imagery from close by locations.

Macrobenthic Group A – One biotope aligned with the community observed within this group: A5.433 '*Venerupis senegalensis*, *Amphipholis squamata* and *Apseudes latreilli* in infralittoral mixed sediment'. This is consistent with the sediment analysis indicating that stations belonging to Macrobenthic Group A consisted of mixed sediments representative of BSH A5.4 'Sublittoral mixed sediments'. The key taxa found in this group was *Amphipholis squamata*.

Station ST02 classified as an outlier based on cluster analysis with the main difference in the community composition between this station and macrobenthic group A being a notably lower abundance of Nematoda and the absence of the brittle star *A. squamata* and the bivalve *K. bidentata*. In turn, characterising taxa at ST02 were the oligochaetes *T. pseudogaster* and *Tubificoides benedii* and amphipods of the family Corophiidae. Based on the shallow location of this station and PSA results ST02 was assigned to habitat A5.13 'Infralittoral coarse sediments'.

Station ST04 was also an outlier whose macrobenthic community differed from that of macrobenthic group A due to a higher abundance of Nematoda, Acari, *T. benedii*, the ascidian *Dendrodoa grossularia* and the sea spider *Callipallene brevirostris*. In contrast, *A. squamata* was absent in ST04. Considering that the PMF habitat 'Kelp and Seaweed Communities on Sublittoral Sediment' was observed in proximity to ST04 on cobbles, pebbles and gravel, and that PSA indicated the presence of coarse sediment, ST04 was assigned to habitat A5.13 'Infralittoral coarse sediments'.

Outlier station ST07 had a macrobenthic community that diverged from that observed in macrobenthic group A as it presented a higher abundance of Nematoda, *K. bidentata,* the sea cucumber *Leptosynapta inhaerens,* the amphipod *Dexamine thea,* the sea snail *Caecum glabrum* and the polychaete *Pseudosyllis brevipennis,* while *A. squamata* occurred in lower abundances. Considering the presence of the PMF habitat 'Kelp and Seaweed Communities on Sublittoral Sediment' in proximity to this station and the results of the PSA indicating mixed sediments, ST07 was assigned to habitat A5.43 'Infralittoral mixed sediments'.

Lastly, ST08 also categorized as an outlier and exhibited lower abundance of Nematoda, *A. squamata* and *K. bidentata* than macrobenthic group A, while it was characterised by the presence of the oligochaetes *T. pseudogaster* and *Grania* sp.. Considering that the PMF habitat 'Kelp and Seaweed Communities on Sublittoral Sediment' was observed in proximity to this

station and that PSA indicated the presence of coarse sediment, station ST08 was assigned to habitat A5.13 'Infralittoral coarse sediments'.

7. Discussion

This report presents the results and interpretation of the seabed imagery, sediment, and macrobenthic analyses with the aim to set out the environmental baseline conditions to inform the EIA process in support of upgrades to ferry infrastructure for the introduction of electric vessels on the Corran Ferry route.

7.1. Seabed Imagery

Seabed imagery was successfully captured across nine pre-determined DDC transects and four kelp transects determined in the field, resulting in the acquisition of 415 still images and 27 videos. A diverse range of habitats was identified across the survey area including rocky habitats including BSHs A3.1, A3.2, A3.3, A4.1 and A4.2, soft sediment habitats including BSHs A5.1, A5.4, and A5.5. The dominant biotope among all the observed BSHs was A5.521 '*Laminaria saccharina* and red seaweeds on infralittoral sediments' being the most frequently encountered.

EUNIS classification A5.52, A5.521, A5.5211, A5.5212, A5.5213, and A5.523 were recorded biotope components of the PMF habitat 'Kelp and Seaweed Communities on Sublittoral Sediment' recognised for its conservation significance in Scottish waters. This PMF was observed in 3 out of 4 kelp transects (K1, K2, and K3) and 6 out of 9 DDC transects (T02, T03, T04, T05, T07, and T08). Three additional PMF habitats were observed across the survey area: 'Kelp beds,' 'Low or Variable Salinity Habitats,' and 'Tide-Swept Algal Communities.' More specifically, EUNIS classifications A3.115, A3.2121, A3.214, and A3.2143 were observed on the east side of the survey area at K4, T06, T07, and T08 and were biotope components of the PMF habitat 'Kelp beds'. Biotope A3.322 was observed on the west of the survey area at T01 and represented the PMF habitat 'Low or Variable Salinity Habitats', while the following habitats and biotopes were also observed in transects on the western side of the survey area at T02 and T04 and represented the PMF habitat 'Tide-Swept Algal Communities': A3.322 and A3.126 for A3.115, A3.126, A3.2121, A3.214, A3.2143, A3.222, A3.322, A5.52, A5.521, A5.5211, A5.5212, A5.5213, and A5523.

The Annex I Reef assessment identified various reef types, including Low Stony, Low Stony and Bedrock, Bedrock, and Bedrock and Low Stony reefs. These rocky habitats have the characteristics to qualify as Annex I stony and bedrock reefs however as the survey area does not sit within the boundaries of a marine protected site, these habitats are therefore not afforded protection as such. However, they are considered important components of the biodiversity of Scottish seas and should be recorded to provide evidence for future nature conservation actions. The transects covering stony and bedrock reefs included T04, T05, T06, T07, T08, T10, K3 and K4.

Owing to dense areas of red and brown macroalgae and kelp across the survey area, numerous images could not be fully analysed as they were deemed of poor visual quality or 'zero (not analysable)' as it was impossible to see the substrate. This meant that the Annex I reef assessment could not be carried out at these locations resulting in a potential underestimation of the extent of reef features across the survey area.

7.2. Sediments

For the seven sediment samples collected during the survey, analysis confirmed the BSH A5.1 'Coarse sediment' at stations ST04, ST02, ST08 and BSH A5.4 'Mixed sediment' at ST01, ST03, ST05, ST07. Sand emerged as the most abundant textural grouping, followed by gravel. These findings align with the area's topography, especially given their proximity to the coast.

7.3. Macrobenthos

A diverse macrobenthic assemblage was identified across the survey area from the seven macrobenthic samples collected, with a total of 3,780 individuals and 185 taxa recorded. The most abundant taxon with the maximum abundance per sample, and average density per sample was Nematoda. The annelid *P. inornata* exhibited the greatest occurrence in the survey area.

Macrobenthic communities can be highly heterogenous as they are heavily influenced by ambient environmental conditions such as sediment composition (Cooper et al., 2011), hydrodynamic forces and physical disturbance (Hall, 1994), depth (Ellingsen, 2002), and salinity (Thorson, 1966). This was reflected in the macrobenthic communities observed across the survey area where three stations grouped together based on the similarity in their macrobenthic community supported by mixed sediments. A key species at these stations was *A. squamata* suggesting that the biotope present across stations ST01, ST03 and ST05 was A5.433 '*Venerupis senegalensis*, *Amphipholis squamata,* and *Apseudes latreilli* in infralittoral mixed sediment'. All other stations did not belong to a specific macrobenthic group based on their community compositions however they were all characterised by coarse sediments except for Station ST07 which was made of mixed sediments. A reason behind this could be that in the analysis of macrobenthic data, seaweed and kelp were recorded as presence/absence data and not counted. Thus, meaning that their presence was factored into diversity calculations, but not considered in abundance calculations or included in the multivariate analysis. Consequently, stations that did not belong to a specific macrobenthic group could have been stations where seaweed and kelp were predominant. Seabed imagery collected in closed proximity of grab samples ST02, ST04, ST07 and ST08 provided evidence of the PMF habitat 'Kelp and Seaweed Communities on Sublittoral Sediment' being present. Despite this some of the macrobenthic community recorded at stations ST02, ST04, ST07 and ST08 aligned with that typically found associated with kelp and seaweed communities including ascidians, gastropods and amphipods, the habitat assignment of these stations was left a level 4 rather than 5 due to the lack of consistent data pointing to a specific biotope.

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Corran Ferry Infrastructure Improvement Scheme

Appendix N.2: Intertidal Benthic Survey Report

Affric
making it happen

Wallace Stone
Consulting Civil Engineers

The Highland Council
Comhairle na Gàidhealtachd

OCEAN ECOLOGY

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Corran Ferry Intertidal Surveys 2024:

Survey Report

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Abbreviations

CAA	Civil Aviation Authority
CFIIS	Corran Ferry Infrastructure Improvement Scheme
DEM	Digital Elevation Model
EIA	Environmental Impact Assessment
EUNIS	European Nature Information System
GPS	Global Positioning System
GSD	Ground Sampling Distance
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
MHWS	Mean High Water Springs
OEL	Ocean Ecology Ltd
PfCO	Permission for Commercial Operations
PMF	Priority Marine Features
RMSE	Root Mean Square Error
RPQ	Remote Pilot Qualification
UAV	Unmanned Aerial Vehicle
UTM	Universal Transverse Mercator

1. Non-Technical Summary

This report presents the results of the intertidal surveys conducted at Corran Narrows as part of the ongoing Ground Investigation surveys for the proposed new ferry infrastructure to support the Corran Ferry Infrastructure Improvement Scheme (CFIIS). The key aim of the survey was to characterise and map marine habitats and biotopes to inform the Environmental Impact Assessment (EIA).

This survey involved the collection of Unmanned Aerial Vehicle (UAV) imagery, accompanied by Phase I Walkover to ground truth UAV data and characterise habitats along the eastern side of Corran Narrows at Nether Lochaber and the western side of Ardgour.

A suite of aerial images and targeted field notes were collected across the full extent of the intertidal foreshore from Mean High Water Springs (MHWS) to the extent of low water at the time of survey. A range of broadscale littoral rock and sediment habitats were identified with varied associated macroalgal and faunal communities typical of the intertidal areas of the wider Loch Linnhe region. The eastern survey area was characterised by a low energy rocky shore environment with different species of macroalgae exhibiting a typical zonation pattern with height on the shore.

The western survey area was representative of a low to moderate energy coarse shingle / cobble shoreline with some areas of clean sand and much reduced macroalgae cover due to the reduced availability of stable substrate.

Bedrock and stony reef habitats were recorded in the eastern survey area and were generally dominated by high densities of *Ascophyllum nodosum* and *Fucus serratus*. These features may qualify as Annex I reef habitats if they were to continue into the subtidal which will be determined as part of the combined subtidal and intertidal habitat mapping process.

2. Introduction

2.1. Project Overview

Affric Ltd. have been commissioned to undertake Ground Investigation surveys to inform the detailed design of new ferry infrastructure to support the Corran Ferry Infrastructure Improvement Scheme (CFIIS) at the Corran Narrows. The ferry service crosses Loch Linnhe in Scotland from the Eastern side of Nether Lochaber to the Western side of Ardgour.

On the instruction of Affric Ltd, a survey campaign was required to provide detailed information on the habitats and environmental characteristics of intertidal areas associated with the proposed infrastructure development locations.

2.2. Project Background

Ocean Ecology Ltd. (OEL) were commissioned by Affric Ltd. to undertake the required intertidal survey scope to acquire marine habitat and species data to inform the Environmental Impact Assessment (EIA) Report.

The intertidal surveys consisted of the following work scopes:

- Unmanned Aerial Vehicle (UAV) mapping using a drone to cover the proposed construction areas.
- Phase I intertidal walkover surveys at the site to ground truth UAV data and characterise habitats.

The survey was undertaken during a low spring tide on the 4th of September 2024. The findings of this survey will supplement the findings of a subtidal benthic characterisation survey undertaken in 2023 at the same location.

The objective of the intertidal survey was to provide full biotope mapping in accordance with EUNIS classification, the identification and distribution of Priority Marine Features (PMFs), and presence of Invasive Non-Native Species (INNS).

2.3. Document Overview

This report provides a summary of the survey methodologies employed and the preliminary survey results.

2.4. Site Location

The Corran Ferry, operated by The Highland Council, crosses Loch Linnhe from Eastern side of Nether Lochaber to the Western side of Ardgour (Figure 1). The ferry operates a regular service 7-days a week, providing a vital ferry connection, linking the communities of Fort William, Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Morvern and the Isles of Mull.

The ferry service shall continue to operate throughout the period of the Ground Investigation works without disruption, except during periods when adverse weather or other factors prevent the service from operating on the published timetable.

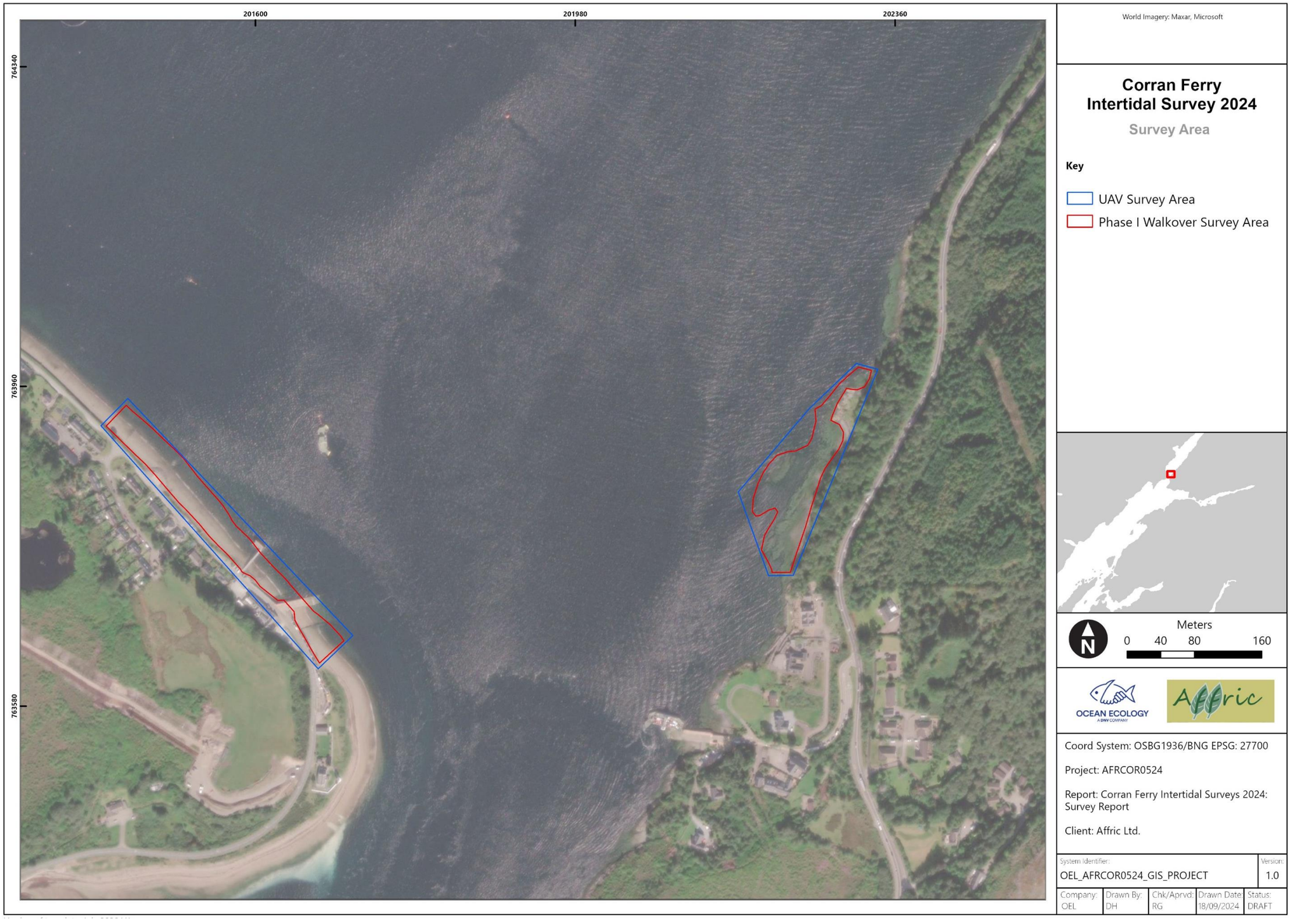

Figure 1 Overview of intertidal UAV and Phase I Walkover survey areas at Corran Ferry.

3. Survey Methodology

3.1. Survey Design

The intertidal survey covered two areas, one approximately 265 m wide corridor on the eastern side of the Corran Narrows and one approximately 380 m wide on the western side. The survey aimed to cover the shore height from Mean High Water Springs (MHWS) to the extent of low tide on the day of survey (Figure 1). Both areas were sampled within the same tidal window with the eastern side completed first in the three hours prior to low water and the more accessible western side completed following low water. Due to time constraints associated with sampling both survey areas on a single low tide, the lower shore height accessible on the western side was limited.

3.2. Survey Methods

3.2.1. UAV Mapping

UAV mapping was carried out in consideration of the Joint Nature Conservation Committee (JNCC) guidance for use of UAVs in marine benthic monitoring (Crabb et al. 2019). All flights were conducted by an OEL Qualified UAV Pilot (RPQ) under its Permission for Commercial Operations (PfCO) (CAA ID: 2654) granted by the Civil Aviation Authority (CAA). The UAV used was a DJI Mini 4 Pro multi-rotor quadcopter and all flights will be pre-planned using the onboard DJI software.

All survey flight lines, orientation, sampling frequency and minimum resolution limits were planned to achieve a minimum resolution of 5 cm/pixel with an accuracy of 5-10 m.

3.2.2. Phase I Walkover Survey

The Phase I intertidal survey was undertaken in line with the Marine Monitoring Handbook (Davies et al. 2001) and CCW Handbook for Marine Intertidal Phase I Survey and Mapping (Wyn et al. 2006) and using ESRI Field Maps on a Bad Elf GPS & GLONASS (2.5m accuracy) enabled tablet device. During the walkover survey, biotopes were identified according to the EUNIS classification in line with relevant guidance (Parry 2019) (and correlated to the MNCR biotopes).

Representative examples of each habitat / biotope encountered were photographed. Additionally, the distribution of any features of conservation interest were recorded using photographs and GPS fixes. The presence of any INNS was also to be noted if present and their location recorded. Other information recorded included general site conditions, sediment surface features (e.g. *Arenicola* worm casts), sediment type and characteristics, topography and evidence of any anthropogenic pressures (e.g. outfall pipes).

Target notes were taken at regular intervals and at different heights on the shore as well as at any notable change in habitat / substrate to aid in the habitat mapping process, accurately delineate boundaries and confirm the location of any notable features (e.g. littoral rockpools) identified. Target notes were accompanied by GPS fixes and close-up photographs of features and biotope

assemblages, along with general site photographs immediately surrounding the fixed position. In general, most target note locations are accompanied by 4-5 photographs, used to consolidate field notes post survey and inform subsequent habitat mapping.

3.3. Project Parameters

3.3.1. Horizontal Datum

Table 1 Geodetic parameters.

Geodetic Parameters	
Geodetic Datum	OSGB 1936/British National Grid
Ellipsoid	ESPG 27700
Semi-Major Axis (a)	6 378 137.000 m
Semi-Minor Axis (b)	6 356 752.314 m
Inverse Flattening (1/f)	298.257 223 563
Projection	Universal Transverse Mercator (UTM)
Zone	30 N
Central Meridian (CM)	3° West
Latitude of Origin	0° North
False Easting	500 000 m
False Northing	0 m
Scale Factor on CM	0.9996

3.3.2. Datum Transformation Parameters

All data is referenced to OSGB 1936/British National Grid ESPG 27700, with no datum transformation need. No conversion or test coordinate was provided by the Client.

3.3.3. Unit Format and Conversions

The following units were used throughout this project and are expressed using the following conventions.

Table 2 Project unit format and convention details.

Unit Formats and Conventions	
Geographical Coordinates	Latitude N DD˚MM.mmmmmm' to 6 decimal places. Longitude E/W DD˚MM.mmmmmm' to 6 decimal places.
Grid Coordinates	Meters in the following format: Easting EEE EEE.eee m to 3 decimal places. Northing NNN NNN.nnn m to 3 decimal places.
Linear distances	Meters to 1 decimal places.
Time	Local unless otherwise stated.

3.4. Data Analysis & Interpretation

3.4.1. UAV Imagery Analysis

Following initial screening to remove any erroneous images, all images collected during the UAV mapping flights underwent Terrain (2D) processing in the Drone Deploy software and were 'stitched' together to generate orthomosaic and Digital Elevation Model (DEM) outputs for the intertidal survey area.

4. Preliminary Results

4.1. Survey Progress

The UAV and Phase I intertidal walk over surveys were undertaken on a single spring tide on the 4th of September 2024. Table 3 provides a summary of the sampling undertaken during the surveys.

Table 3 Summary of sampling undertaken during the Corran Ferry intertidal surveys.

Sampling Type	East	West	Total
UAV Imagery (individual images)	82	143	225
Phase I Walkover Target Notes	99	72	171

4.2. UAV Surveys

UAV mapping was undertaken at the Corran Ferry East survey area around low water on 4th September 2024. A seven-minute flight was undertaken from 13:28 to 13:35 hrs with low water approximately 13:40 hrs. Flight height was maintained at 45 m. Weather conditions (e.g. wind / precipitation) remained moderate for data collection throughout the flight with occasional northeasterly wind gusts in excess of 10 m/s.

The UAV flight of Corran Ferry East successfully captured 82 high-resolution nadir images (Table 3 and Plate 1) covering an area of 65,550 m^2 to produce a high resolution orthomosaic model (GSD =1.02 cm/px) and DEM (GSD = 2.90 cm/px) with average Root Mean Square Error (RMSE) accuracy level of 0.35 m (Figure 2).

On completion of the first UAV flight at Corran Ferry East, the survey team returned to the ferry terminal and travelled to the survey area at Corran Ferry West, arriving at approximately 14:30 hrs. A UAV flight was first attempted at 14:45 hrs but had to be aborted by the pilot due to strong northeasterly winds pushing the UAV off the designed line plan. The decision was made to continue with the Phase I Walkover survey to capture habitats and biotopes in the lowest section of the shore due to the incoming tide. On completion and once at a safe distance up the shore, UAV imagery was collected via a series of smaller manual flights at a reduced flight height and with control retained by the pilot at all times to counteract the wind. Imagery was therefore collected periodically between 14:45 and 16:11 hrs and flight height was between 30 and 45 m depending on wind speed.

The UAV flight of Corran Ferry West successfully captured 143 high-resolution nadir images (Table 3 and Plate 2) covering an area of 64,412 m^2 to produce a high resolution orthomosaic model (GSD =1.02 cm/px) and DEM (GSD = 1.70 cm/px) with average RMSE accuracy level of 1.36 m (Figure 3).

Plate 1 Example UAV imagery captured at Corran Ferry East.

Plate 2 Example UAV imagery captured at Corran Ferry West.

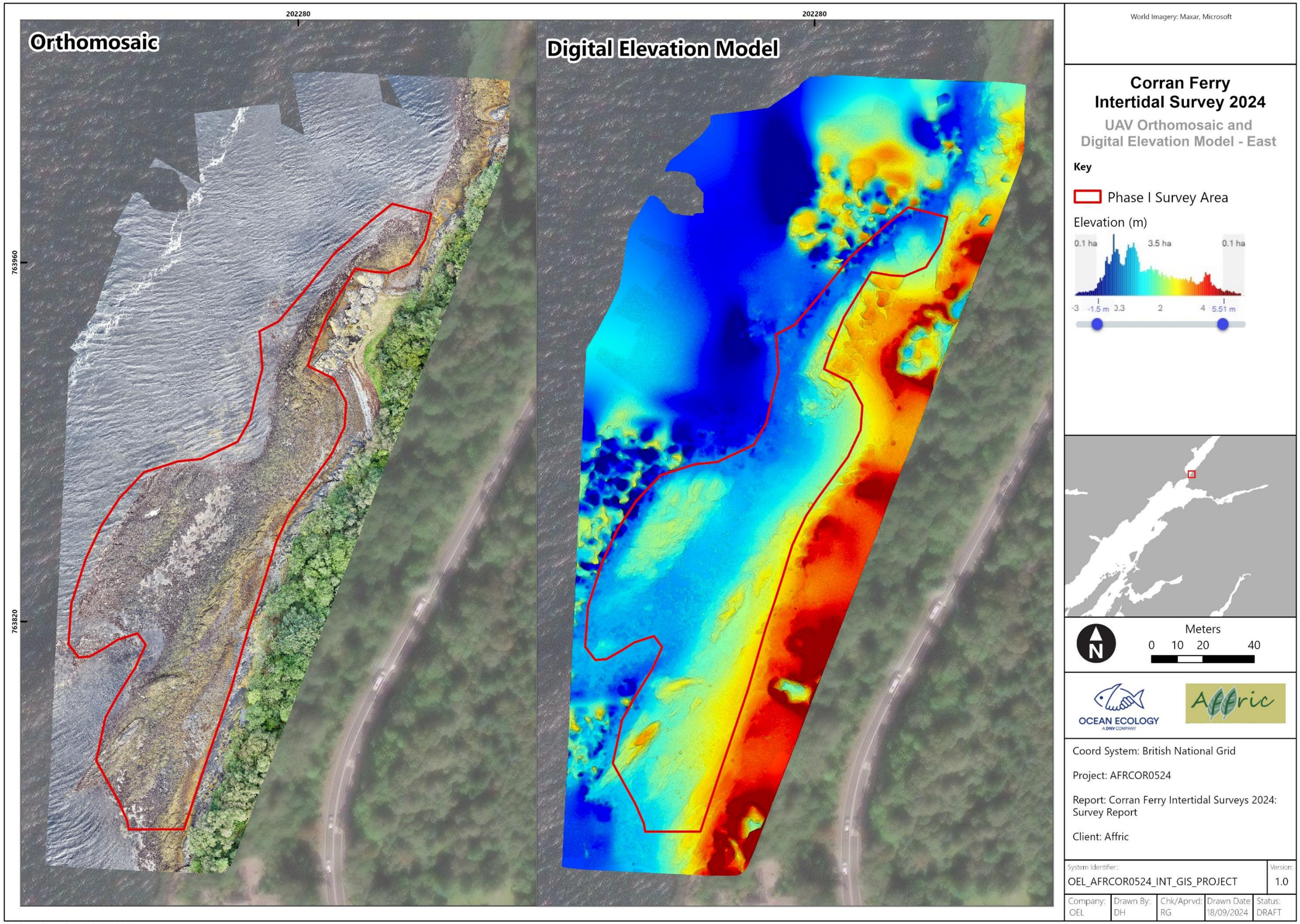

Figure 2 UAV orthomosaic and Digital Elevation Model (DEM) generated from the UAV imagery collected during the intertidal survey of Corran Ferry East survey area.

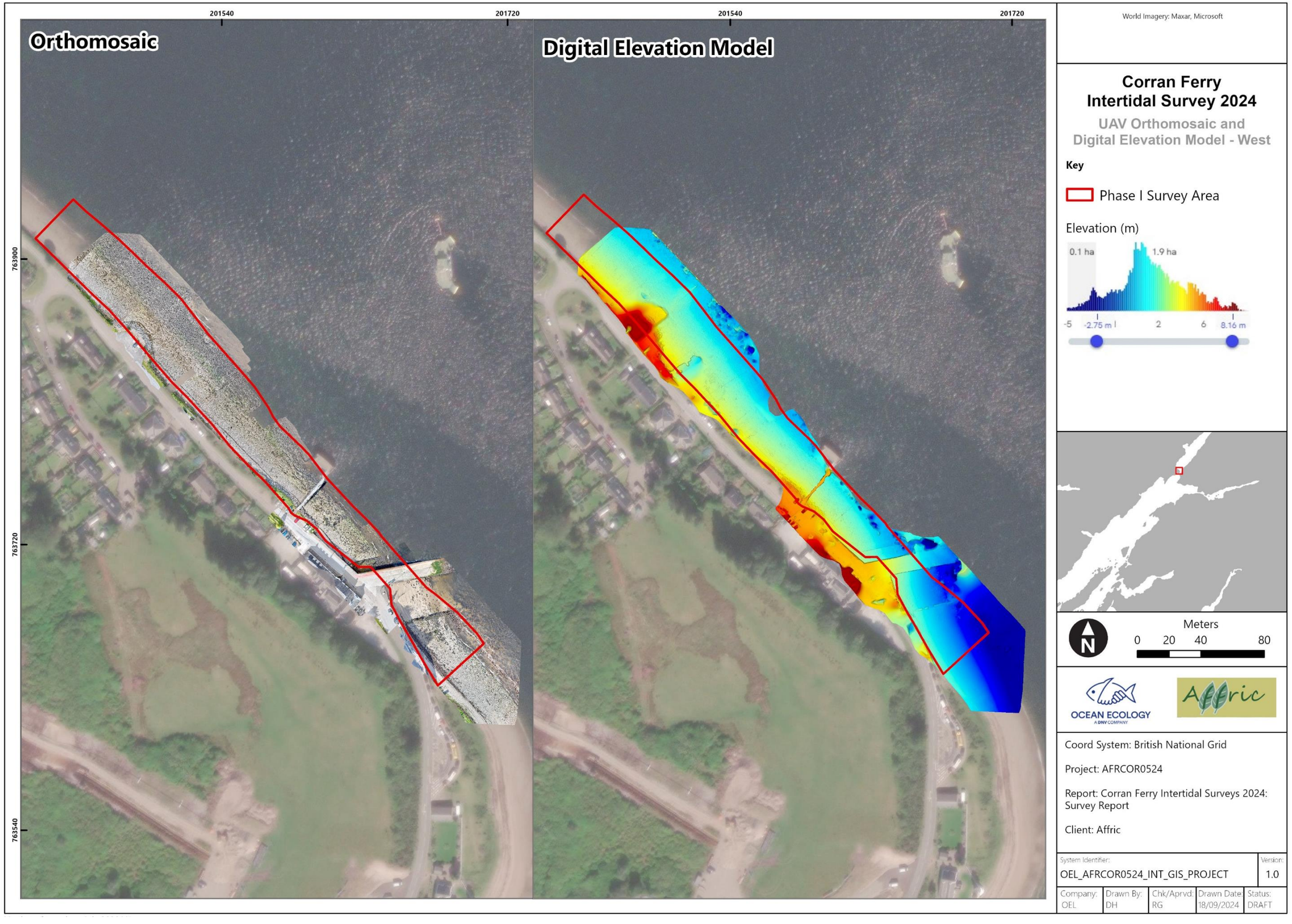

Figure 3 UAV orthomosaic and Digital Elevation Model (DEM) generated from the UAV imagery collected during the intertidal survey of Corran Ferry West survey area.

4.3. Phase I Sampling

In total, 171 target notes were taken across both survey areas to provide localised information on habitats and features of interest present across the intertidal survey areas and assist in the ground truthing of UAV imagery during habitat mapping. At each of these target locations, information on the substrate and taxa present was recorded along with any useful notes from the field ecologist to better describe the immediate surrounding area and zonation patterns.

In general, the eastern survey area was characterised by a typical low energy rocky shore environment with different species of macroalgae occupying different heights on the shore. Other organisms colonising hard substrates across the survey area included the barnacle *Semibalanus balanoides,* periwinkles *Littorina* spp., and limpets *Patella vulgata with* the beadlet anemone *Actinia equina* present within rock crevices and small rock pools. Example field imagery collected during the intertidal survey of the east survey area is provided in Plate 3.

The western site was representative of a coarse shingle / cobble shoreline with some areas of clean sand and finer shingle to the point in the southeast. Macroalgae cover was reduced and restricted to the larger, stable cobbles in the mid to lower shore. Ephemeral green seaweeds were present along the shoreline and other organisms present on stable substrate included *S. balanoides* and *Littorina* spp. Example field imagery collected during the intertidal survey of the west survey area is provided in Plate 4.

Plate 3 Corran Ferry East. Top Left: *F. spiralis* and *P. canaliculata* extending into the upper shore. Top Right: Typical rocky shore zonation with dense *A. nodosum* in the mid to lower shore. Bottom Left: Coarse sediment habitat in the lower shore. Bottom Right: *F. serratus* on cobble and boulder with kelp below the waterline.

Plate 4 Corran Ferry West. Top Left: Ephemeral green seaweeds in mid shore and *F. vesiculosus and F. serratus* in lower shore. Top Right: Dense *A. nodosum* on ferry terminal infrastructure and zonation on vertical wall. Bottom Left: Sandy beach to the east of the jetty with sparse fucoids. Bottom Right: Caged sea defence structure with dense fucoids and *S. balanoides*.

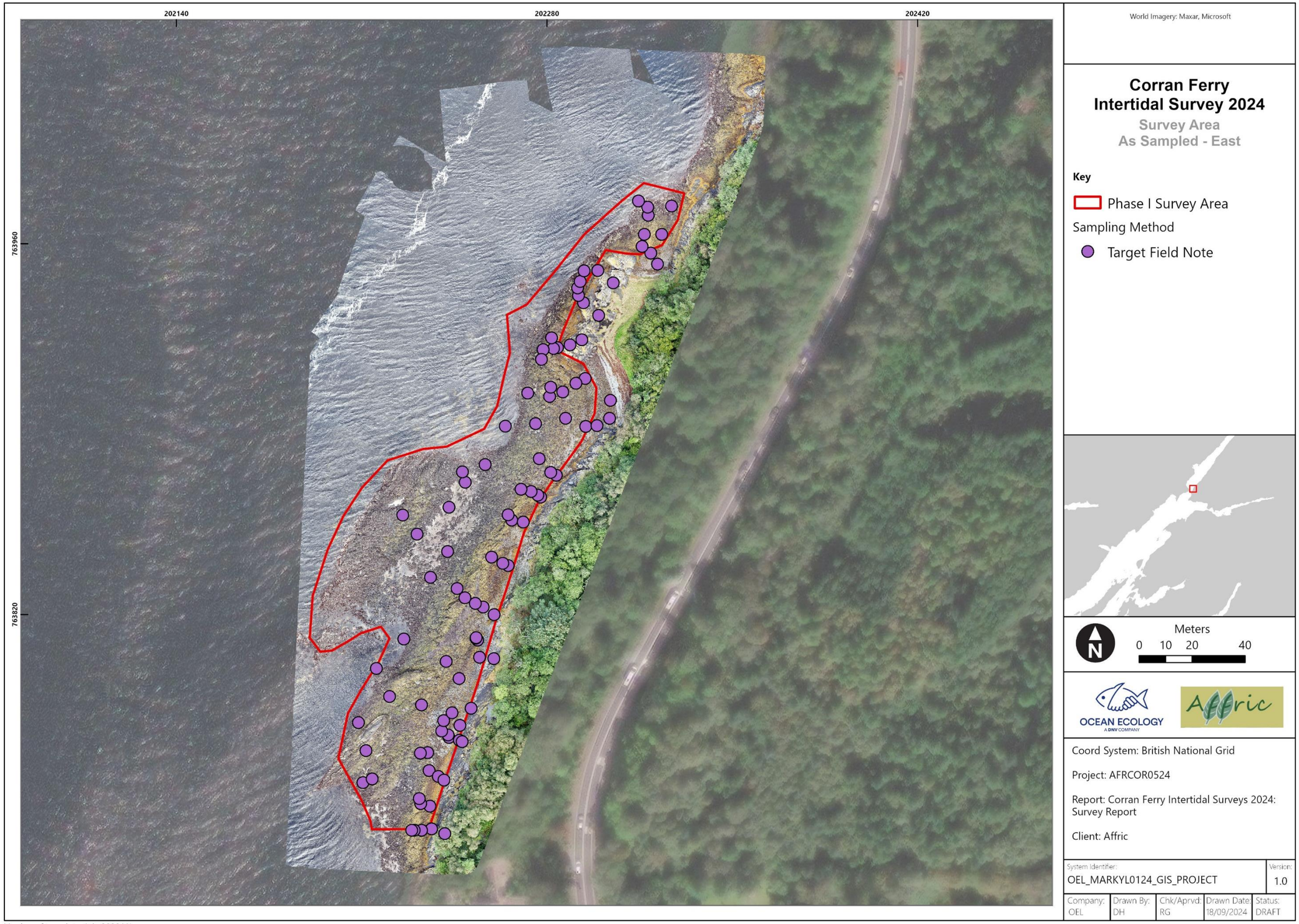

Figure 4 Location of target notes collected within the Corran Ferry East survey area.

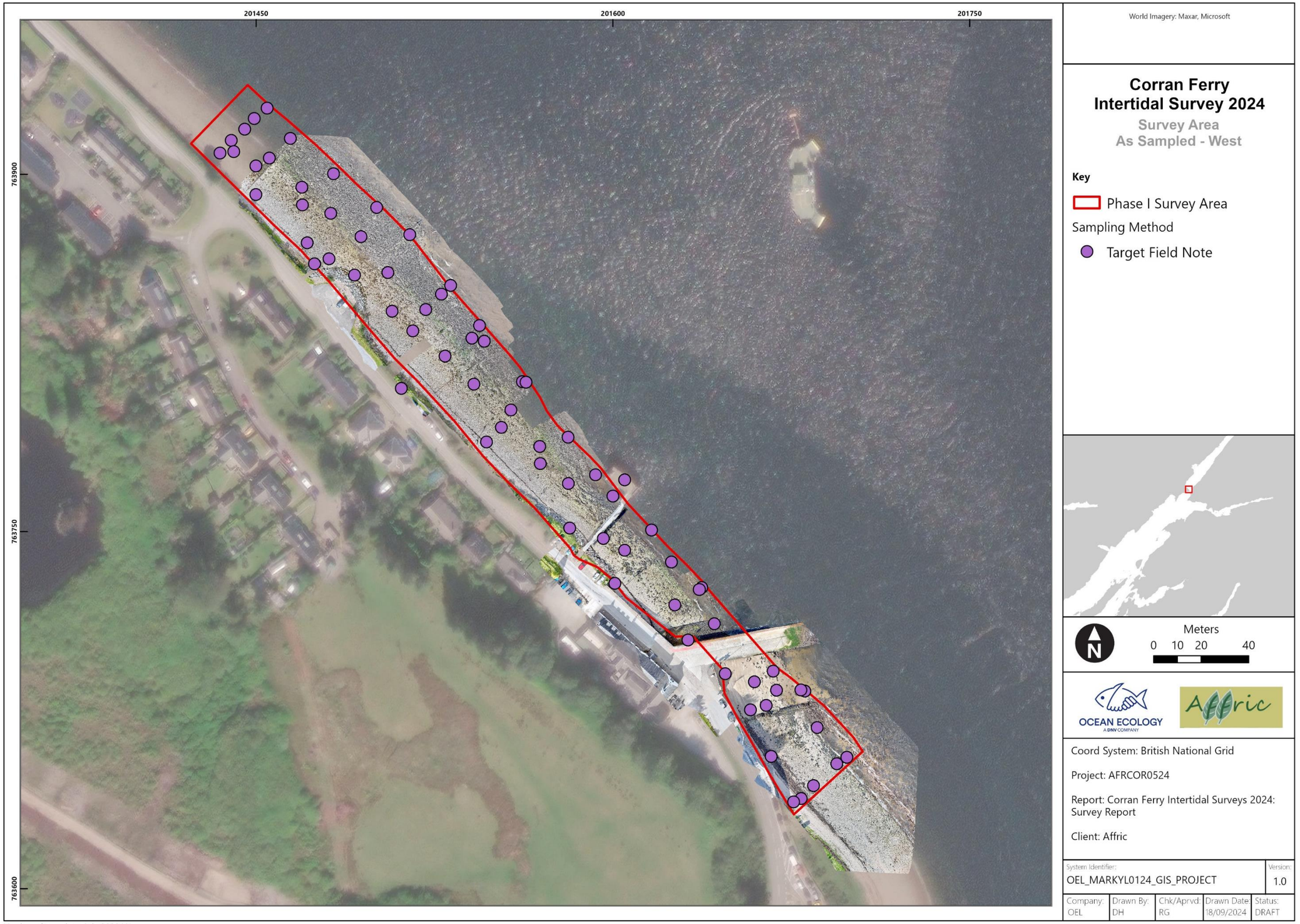

Figure 5 Location of target notes collected within the Corran Ferry West survey area.

4.4. General Habitat

A summary of provisional EUNIS classifications recorded during the intertidal surveys is provided in Table 4. The survey site presented a range of broadscale littoral rock and sediment / mixed substrata habitats with associated algal and faunal communities typical of the intertidal areas of Loch Linnhe.

Table 4 Provisional list of EUNIS classifications recorded at Corran Ferry.

EUNIS BSH	EUNIS Code	EUNIS Description
A1.1 - High Energy Littoral Rock	A1.1131	*Semibalanus balanoides*, *Patella vulgata* and *Littorina* spp. on exposed to moderately exposed or vertical sheltered eulittoral rock
A1.2 - Moderate Energy Littoral Rock	A1.212	*Fucus spiralis* on full salinity exposed to moderately exposed upper eulittoral rock
	A1.2141	*Fucus serratus* and red seaweeds on moderately exposed lower eulittoral rock
A1.3 - Low Energy Littoral Rock	A1.312	*Fucus spiralis* on sheltered upper eulittoral rock
	A1.3122	*Fucus spiralis* on full salinity upper eulittoral mixed substrata
	A1.3132	*Fucus vesiculosus* on mid eulittoral mixed substrata
	A1.314	*Ascophyllum nodosum* on very sheltered mid eulittoral rock
	A1.3142	*Ascophyllum nodosum* on full salinity mid eulittoral mixed substrata
	A1.315	*Fucus serratus* on sheltered lower eulittoral rock
	A1.3152	*Fucus serratus* on full salinity lower eulittoral mixed substrata
	A1.321	*Pelvetia canaliculata* on sheltered variable salinity littoral fringe rock
	A1.322	*Fucus spiralis* on sheltered variable salinity upper eulittoral rock
	A1.324	*Ascophyllum nodosum* and *Fucus vesiculosus* on variable salinity mid eulittoral rock
	A1.326	*Fucus serratus* and large *Mytilus edulis* on variable salinity lower eulittoral rock
A1.4 - Features of Littoral Rock	A1.421	Green seaweeds (*Enteromorpha* spp. and *Cladophora* spp.) in shallow upper shore rockpools
A2.1 - Littoral Coarse Sediment	A2.11	Shingle (pebble) and gravel shores
A2.2 - Littoral Sand and Muddy Sand	A2.21	Strandline
A2.4 - Littoral Mixed Sediments	A2.431	Barnacles and *Littorina* spp. on unstable eulittoral mixed substrata
A2.8 - Features of Littoral Sediment	A2.82	Ephemeral green or red seaweeds (freshwater or sand-influenced) on mobile substrata

4.5. Features of Interest

Bedrock and stony reef habitats were recorded within the east survey area appearing to continue into the subtidal in areas due to the observation of kelp below the low water mark. Rock areas were dominated by high densities of *Ascophyllum nodosum* and *Fucus vesiculosus* in the mid shore and *Fucus serratus* in the lower shore. These features may qualify as Annex I reef habitats if they continue into the subtidal which will be determined as part of the combined subtidal and intertidal habitat mapping process for the EIA chapter.

5. References

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Corran Ferry Infrastructure Improvement Scheme

Appendix O.1: Technical Appendix 15.A Gazetteer

Asset/Event Number	1
Asset/Event Name	ARDGOUR, ARDGOUR HOTEL
Type of Asset/Event	Hotel
Date and/or Period:	
Listing No./NRHE Number	LB1686
HER Number	
Status	Category C Listed Building
Easting	201607
Northing	763696
Parish	Ardgour
Council	Highland
Description	Early 19th century, with subsequent alterations and extensions. 2-storey, 6-bay, east facing double gabled building with additions north and south. All white harled with contrasting painted tooled ashlar margins. Main front fenestration grouped in 2 3-bay sections, with off-centre projecting gabled porch masking entrance. 2-pane glazing. Single storey rubble range with gable in east on south gable; further single storey and attic, 3-bay addition with much altered fenestration set back at north gable. End and ridge stacks; slate roofs. Statement of Special Interest Sited opposite Corran Ferry Pier the core of which is by Thomas Telford, circa 1815.

Asset/Event Number	2
Asset/Event Name	ARDGOUR, CORRAN NARROWS, STORE
Type of Asset/Event	Former Lighthouse Store
Date and/or Period:	
Listing No./NRHE Number	LB1691
HER Number	
Status	Category C Listed Building
Easting	201679
Northing	763551
Parish	Ardgour
Council	Highland
Description	Later 19th century, single storey, 3-bay red brick storehouse, with yellow brick contrasting detailing. Long elevations north and south with wide segmental headed entrance in centre of north front, flanked by pilaster strips in yellow brick detailing; similar angle pilaster strips. Small round-headed windows in outer bays flanking entrance, and paired in east gable. Ashlar crowsteps and apex ball finials; slate roof. Statement of Special Interest Former lighthouse store, now used by Corran Ferry service.

Asset/Event Number	3

Asset/Event Name	ARDGOUR, CORRAN NARROWS, TIGH SOLUIS (FORMER LIGHTHOUSE KEEPERS' DWELLINGS)
Type of Asset/Event	Former Lighthouse Keeper' Dwelling and Garden Wall
Date and/or Period:	
Listing No./NRHE Number	LB1690
HER Number	
Status	Category C Listed Building
Easting	201679
Northing	763498
Parish	Ardgour
Council	Highland
Description	1860, 2-storey, symmetrical 3-bay double gabled house with separate dwellings in ground and 1st floors. All white harled with contrasting painted tooled ashlar margins. Centre doors in east elevation, that in 1st floor served by forestair. Symmetrical 3-window fenestration to rear, both ground and 1st floors; lying-pane glazing end stacks; slate roofs. Single storey lean-to extensions to both north and south gables. Rubble garden wall with roughly dressed coped encircles dwelling and lighthouse; pair square tooled ashlar gatepiers with matching pedestrian entrance, all with shallow pyramidal caps. Simple cast-iron gates. Statement of Special Interest Tigh Soluis now a private house. Former lighthouse fluted cast-iron sundial in garden (standard design). References Bibliography R W Munro, SCOTTISH LIGHTHOUSES (1979) p.275.

Asset/Event Number	4
Asset/Event Name	ARDGOUR, CORRAN NARROWS LIGHTHOUSE
Type of Asset/Event	Lighthouse
Date and/or Period:	
Listing No./NRHE Number	LB1689
HER Number	
Status	Category C Listed Building
Easting	201698
Northing	763495
Parish	Ardgour
Council	Highland
Description	David and Thomas Stevenson, Engineers, 1860. Stumpy circular lighthouse; white harled with contrasting painted ashlar margins. Entrance in east face; corbelled balcony encircles wallhead with cast-iron balustrade; domed light with lattice glazing. Statement of Special Interest Light now automatic. References Bibliography R W Munro, SCOTTISH LIGHTHOUSES (1979) p.275

Asset/Event Number	5
Asset/Event Name	ARDGOUR PARISH CHURCH (CHURCH OF SCOTLAND) AND BURIAL GROUND
Type of Asset/Event	Church and Burial Ground
Date and/or Period:	
Listing No./NRHE Number	LB1688
HER Number	
Status	Category B Listed Building
Easting	201046
Northing	764181
Parish	Ardgour
Council	Highland
Description	Thomas Telford, 1829, with subsequent alterations. Rectangular with standard Parliamentary Church NE front elevation; all squared, coursed grey granite with contrasting tooled sandstone dressings and harled gables. Shallow pointed-headed entrance in outer bays of NE front, now blocked. 2 shallow pointed headed windows in centre of main front, similar single windows in NW and SE gables. Standard 1829 metal Y-tracery transom and mullion window frames with lattice pane glazing, except in SE gable. Late 19th century square single storey porch with crenellated wallhead masking later entrance in NW gable. Small single storey, 2-bay vestry projects at rear with entrance door and shallow pointed headed window with moulded wooden mullion and transomed Y-tracery window with multi-pane and Y-tracery glazing. Parliamentary Church type bellcote at SE gable; cross finial at NW; flat skews; Interior: re-cast in late 19th century to SE. 2 panelled doors in centre of SW wall, in shallow pointed headed openings and both set in similar shaped recess. (1 door to vestry, 1 blind). Simple pine pews some fitted with re-used brass candelabra with barley-sugar twist stems. Brass eagle lectern, also re-used. Communion table, pulpit and Elders' seats all 1930 designed by Pilkington Jackson. Pulpit; octagonal panelled pulpit with simple carved detailing to legs carried up as half round decoration at angles. Inscription to AJH MacLean of Ardgour and his widow carved on door. Simple Holy Table with similar angle detailing as pulpit. Elders' bench with shallow canopy and 3 seats below window. Canopy carved wih vine leaf pattern and backboard with 4 roundels with relief carving of insignia of 4 Evangelists. Simple boarded ceiling. Stained glass in SE window. Burial Ground: simple rubble walled burial ground with roughly shaped cope. Pair later 19th century square tooled ashlar gatepiers with pyramidal caps flanked by short length of ornate cast-iron spear-head railing on low coped retaining wall; matching pair cast-iron gates. Statement of Special Interest Ecclesiastical building in use as such. Unusual variation of standard Teleford T-plan church. Linked to Quoad Sacra (1845). Parish of N. Ballachulish and sharing the services of the minister there, who had his manse by the (now demolished) Parliamentary Church at Onich, rowing over to Ardgour of Corran on alternate Sundays. Present manse of Ardgour dates from 1899 and the Parish now linked with Strontian and Kingairloch. Candelabra and brass eagle lectern from former Episcopal Chapel at Conaglen House on Loch Linnhe. Pulpit and communion table given in memory of A.J. H. MacLean of Ardgour by his daughters and Elders' seat, also in his memory, gifted by his sisters. (Information by courtesy Miss MacLean of Ardgour) - Church built on fine site by shores of Loch Linnhe, looking up the Great Glen. Only Parliamentary Church with vestry, for the use of Minister travelling by boat from Onich. References Bibliography Thomas Telford, AUTOBIOGRAPHICAL ATLAS, (1838) pl. 58-9. Groome's IMPERIAL GAZETTEER OF SCOTLAND, i (circa 1858), pp. 69, 118. ORDNANCE

GAZETTEER OF SCOTLAND, i (1882), pp. 64, 112.
George Hoy, THE ARCHITECTURE OF THE SCOTTISH POST-REFORMATION CHURCH 1560-1843 (1957), p246.
A M MacLean, PARLIAMENTARY CHURCHES IN THE HIGHLANDS (c. 1971 unpublished thesis) p.72-3.

Asset/Event Number	6
Asset/Event Name	ARDGOUR PARISH CHURCH (CHURCH OF SCOTLAND) AND BURIAL GROUND
Type of Asset/Event	Church and Burial Ground
Date and/or Period:	
Listing No./NRHE Number	LB1688
HER Number	
Status	Category B Listed Building
Easting	201067
Northing	764188
Parish	Ardgour
Council	Highland
Description	Thomas Telford, 1829, with subsequent alterations. Rectangular with standard Parliamentary Church NE front elevation; all squared, coursed grey granite with contrasting tooled sandstone dressings and harled gables. Shallow pointed-headed entrance in outer bays of NE front, now blocked. 2 shallow pointed headed windows in centre of main front, similar single windows in NW and SE gables. Standard 1829 metal Y-tracery transom and mullion window frames with lattice pane glazing, except in SE gable. Late 19th century square single storey porch with crenellated wallhead masking later entrance in NW gable. Small single storey, 2-bay vestry projects at rear with entrance door and shallow pointed headed window with moulded wooden mullion and transomed Y-tracery window with multi-pane and Y-tracery glazing. Parliamentary Church type bellcote at SE gable; cross finial at NW; flat skews; Interior: re-cast in late 19th century to SE. 2 panelled doors in centre of SW wall, in shallow pointed headed openings and both set in similar shaped recess. (1 door to vestry, 1 blind). Simple pine pews some fitted with re-used brass candelabra with barley-sugar twist stems. Brass eagle lectern, also re-used. Communion table, pulpit and Elders' seats all 1930 designed by Pilkington Jackson. Pulpit; octagonal panelled pulpit with simple carved detailing to legs carried up as half round decoration at angles. Inscription to AJH MacLean of Ardgour and his widow carved on door. Simple Holy Table with similar angle detailing as pulpit. Elders' bench with shallow canopy and 3 seats below window. Canopy carved wih vine leaf pattern and backboard with 4 roundels with relief carving of insignia of 4 Evangelists. Simple boarded ceiling. Stained glass in SE window. Burial Ground: simple rubble walled burial ground with roughly shaped cope. Pair later 19th century square tooled ashlar gatepiers with pyramidal caps flanked by short length of ornate cast-iron spear-head railing on low coped retaining wall; matching pair cast-iron gates. Statement of Special Interest Ecclesiastical building in use as such. Unusual variation of standard Teleford T-plan church. Linked to Quoad Sacra (1845). Parish of N. Ballachulish and sharing the services of the minister there, who had his manse by the (now demolished) Parliamentary Church at Onich, rowing over to Ardgour of Corran on alternate Sundays. Present manse of Ardgour dates from 1899 and the Parish now linked with Strontian and Kingairloch. Candelabra and brass eagle lectern from former Episcopal Chapel at Conaglen House on Loch Linnhe. Pulpit and communion table given in memory of A.J. H. MacLean of Ardgour by his daughters and Elders' seat, also in his memory, gifted by his sisters. (Information by courtesy Miss MacLean of Ardgour) - Church built on fine site by shores of

	Loch Linnhe, looking up the Great Glen. Only Parliamentary Church with vestry, for the use of Minister travelling by boat from Onich. References Bibliography Thomas Telford, AUTOBIOGRAPHICAL ATLAS, (1838) pl. 58-9. Groome's IMPERIAL GAZETTEER OF SCOTLAND, i (circa 1858), pp. 69, 118. ORDNANCE GAZETTEER OF SCOTLAND, i (1882), pp. 64, 112. George Hoy, THE ARCHITECTURE OF THE SCOTTISH POST-REFORMATION CHURCH 1560-1843 (1957), p246. A M MacLean, PARLIAMENTARY CHURCHES IN THE HIGHLANDS (c. 1971 unpublished thesis) p.72-3.

Asset/Event Number	7
Asset/Event Name	Druimluachrach
Type of Asset/Event	House (Period Unassigned)
Date and/or Period:	
Listing No./NRHE Number	NN06SW 36
HER Number	
Status	Non-designated heritage asset
Easting	200760
Northing	764370
Parish	Ardgour
Council	Highland
Description	

Asset/Event Number	8
Asset/Event Name	Carn Ghilleasbuig Ruaidh
Type of Asset/Event	Cairn (Period Unassigned)
Date and/or Period:	
Listing No./NRHE Number	NN06SW 7
HER Number	
Status	Non-designated heritage asset
Easting	200640
Northing	763900
Parish	Ardgour
Council	Highland
Description	NN06SW 7 0064 6390. (NN 0064 6390) Carn Ghilleasbuig Ruaidh (NAT) OS 6"map, Argyllshire, 2nd ed., (1900) A large cairn of stones whose name means 'Archibald Roy's Cairn'. Name Book 1871. A cairn, some 18.0m in diameter and 2.0m maximum height. The N half has been quarried out leaving only a rim of overgrown debris around this side. It seems likely that the centre

remains intact. The name is still known locally.
Surveyed at 1:2500.
Visited by OS (A A) 27 August 1974.

The remains of what has formerly been a substantial cairn; it has measured about 16 m in diameter and still stands to a height of 3m. The centre shows signs of having been dug into, and a trench has been driven into the middle from the SSE side.
RCAHMS 1980, visited 1973.

References
Ordnance Survey (Name Book. (1848-1878) Object Name Books of the Ordnance Survey (6 inch and 1/2500 scale). Page(s): Book No. 42, 88 RCAHMS Shelf Number: Ref
RCAHMS. (1980a) The Royal Commission on the Ancient and Historical Monuments of Scotland. Argyll: an inventory of the monuments volume 3: Mull, Tiree, Coll and Northern Argyll (excluding the early medieval and later monuments of Iona). Edinburgh. Page(s): 54, No. 22 RCAHMS Shelf Number: A.1.1.INV/21

Asset/Event Number	9
Asset/Event Name	Clovullin, Ardgour New Primary School
Type of Asset/Event	School (Period Unassigned)
Date and/or Period:	
Listing No./NRHE Number	NN06SW 40
HER Number	
Status	Non-designated heritage asset
Easting	200504
Northing	763496
Parish	Ardgour
Council	Highland
Description	Recording Your Heritage Online Clovullin Ardgour Primary School, John Pottie for Highland Regional Council, 1994 Contemporary rural architecture of the best kind, this long, low hall with clerestorey lighting and embracing porches with gently curving arms is an unexpected delight (APRS award). Steel gates by Victoria Anderson of the Glasgow Sculpture Workshop, depicting seahorses, goat and a vigilant owl perched on the gatepost. Taken from "Western Seaboard: An Illustrated Architectural Guide", by Mary Miers, 2008. Published by the Rutland Press http://www.rias.org.uk Archaeology Notes NN06SW 40 00504 63496 Ardgour New Primary School [NAT] OS (GIS) AIB, April 2008.

Asset/Event Number	10
Asset/Event Name	Ardgour, Clovullin, School And House
Type of Asset/Event	School (19th Century), Schoolhouse (19th Century)
Date and/or Period:	

Listing No./NRHE Number	NN06SW 30
HER Number	
Status	Non-designated heritage asset
Easting	200509
Northing	763401
Parish	Ardgour
Council	Highland
Description	Archaeology Notes NN06SW 30 00509 63401 The Old Schoolhouse [NAT] OS (GIS) AIB, April 2008. Architecture Notes Architect: Alexander Ross (I.C. Jan. 10, 1878)

Asset/Event Number	11
Asset/Event Name	Clovullin, Ardgour Memorial Hall
Type of Asset/Event	Public Hall (19th Century)-(20th Century)
Date and/or Period:	
Listing No./NRHE Number	NN06SW 41
HER Number	
Status	Non-designated heritage asset
Easting	200460
Northing	763395
Parish	Ardgour
Council	Highland
Description	Archaeology Notes NN06SW 41 00460 63395 Ardgour Memorial Hall [NAT] OS (GIS) AIB, April 2008.

Asset/Event Number	12
Asset/Event Name	Corran
Type of Asset/Event	Milestone (19th Century)
Date and/or Period:	
Listing No./NRHE Number	NN06SW 49
HER Number	
Status	Non-designated heritage asset
Easting	200760
Northing	763358
Parish	Ardgour

Council	Highland
Description	Field Visit (23 June 2015) Nothing is now visible of this milestone which marked the distance in miles (1) to Ardgour Post Office (NN06SW 37) to the NE and Strontian (14) to the west. The stone is depicted on the 2nd edition of the OS 6-inch map (Argyll and Bute 1900, Sheet XXX.NW) but this was before the road was realigned and the milestones along what is now the A861 moved westwards so that they were calibrated to Corran Ferry rather than the Post Office. This milestone is mostly to have been repositioned about 450m to the south-west (see NN06SW 48). Visited by RCAHMS (JRS) 23 June 2015.

Asset/Event Number	13
Asset/Event Name	Clovullin
Type of Asset/Event	Cist(S) (Period Unassigned)
Date and/or Period:	
Listing No./NRHE Number	NN06SW 5
HER Number	
Status	Non-designated heritage asset
Easting	200860
Northing	763290
Parish	Ardgour
Council	Highland
Description	Archaeology Notes NN06SW 5 0086 6329. The slate side-slab of a cist ploughed up on the croft of Mr Hugh Campbell at Clovullin (name: NN 0045 6325) now forms his door-step A Reid 1909. Three slate slabs, each c.1.2m by c.0.8m now forming a step in a path, but one of which could be the side-slab referred to, lie c.2.0m in front of the concrete doorstep of No 1 Clovullin, at NN 0086 6329, formerly the croft of Mr Hugh Campbell, now deceased. The present occupants of the croft have no knowledge of the find. Visited by OS (R L) 7 May 1970. Listed. No additional information. RCAHMS 1980, visited 1974. References RCAHMS. (1980a) The Royal Commission on the Ancient and Historical Monuments of Scotland. Argyll: an inventory of the monuments volume 3: Mull, Tiree, Coll and Northern Argyll (excluding the early medieval and later monuments of Iona). Edinburgh. Page(s): 62, No. 68 RCAHMS Shelf Number: A.1.1.INV/21 Reid, A. (1909b) 'The vitrified fort of Lochan-an-Gour, Argyllshire', Proc Soc Antiq Scot, vol. 43, 1908-9. Page(s): 42

Asset/Event Number	14
Asset/Event Name	Clovullin
Type of Asset/Event	Burial Ground (Period Unassigned)

Date and/or Period:	
Listing No./NRHE Number	NN06SW 16
HER Number	
Status	Non-designated heritage asset
Easting	201070
Northing	763260
Parish	Ardgour
Council	Highland
Description	Archaeology Notes NN06SW 16 0107 6326 Cladh a' Mhuilinn (NAT) OS 6-inch map, Argyllshire, 1st ed (1875), sheet xxx. The site of a burial ground, of unknown date, which was not dedicated to any saint. Name Book 1875. No trace; no local information. Visited by OS (RL) 7 May 1970. There are no visible remains of this burial-ground; the area in which it was located has been damaged by coastal erosion and recent roadworks. Visited by RCAHMS September 1971. RCAHMS 1980. References Ordnance Survey (Name Book. (1848-1878) Object Name Books of the Ordnance Survey (6 inch and 1/2500 scale). Page(s): Book No.42, 74 RCAHMS Shelf Number: Ref RCAHMS. (1980a) The Royal Commission on the Ancient and Historical Monuments of Scotland. Argyll: an inventory of the monuments volume 3: Mull, Tiree, Coll and Northern Argyll (excluding the early medieval and later monuments of Iona). Edinburgh. Page(s): 135, No.275 RCAHMS Shelf Number: A.1.1.INV/21

Asset/Event Number	15
Asset/Event Name	Corran Moss
Type of Asset/Event	Coin Hoard (Silver)
Date and/or Period:	
Listing No./NRHE Number	NN06SW 6
HER Number	
Status	Non-designated heritage asset
Easting	201020
Northing	763520
Parish	Ardgour
Council	Highland
Description	Archaeology Notes NN06SW 6 0102 6352 (NN 0102 6352) Silver Coins found AD 1857 (NAT) OS 6" map, Argyllshire, 2nd ed., (1914) A hoard of about 13 silver coins, mostly of King David was found in 1857 about 3' below the

	sluice of an old mill dam in Corran Moss. Some were given to the National Museum of Antiquities of Scotland (NMAS). OS Name Book 1871. No further information. Visited by OS (R L) 7 May 1970. References Ordnance Survey (Name Book. (1848-1878) Object Name Books of the Ordnance Survey (6 inch and 1/2500 scale). Page(s): Book No. 42, 75 RCAHMS Shelf Number: Ref

Asset/Event Number	16
Asset/Event Name	Clovullin, Ardvulin
Type of Asset/Event	House (19th Century)
Date and/or Period:	
Listing No./NRHE Number	NN06SW 18
HER Number	
Status	Non-designated heritage asset
Easting	200870
Northing	763600
Parish	Ardgour
Council	Highland
Description	Architecture Notes Architects: Ross & Macbeth (I.C. June 26, 1894) Additions and alterations

Asset/Event Number	17
Asset/Event Name	Ardvulin
Type of Asset/Event	House (Period Unassigned)
Date and/or Period:	
Listing No./NRHE Number	NN06SW 33
HER Number	
Status	Non-designated heritage asset
Easting	200880
Northing	763610
Parish	Ardgour
Council	Highland
Description	References Savills. (1997) Ardvullin, Ardgour, Fort William, Inverness-shire: [sale particulars]. Edinburgh. RCAHMS Shelf Number: D.6.23.ARD.S

Asset/Event Number	18

Asset/Event Name	North Corran, War Memorial
Type of Asset/Event	War Memorial (20th Century)(Possible)
Date and/or Period:	
Listing No./NRHE Number	NN06SW 42
HER Number	
Status	Non-designated heritage asset
Easting	201584
Northing	763456
Parish	Ardgour
Council	Highland
Description	Ardgour War Memorial 06-06-2022 A new track has been built to access a wind power station, this runs past the memorial and gives easier access than previously. Contributed by Martin Briscoe Ardgour War Memorial 17-02-2011 The war memorial is on the mountings of one of the guns of the WWI Royal Marine gun battery. The holdfast can be seen in the concrete. Contributed by Martin Briscoe

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Asset/Event Number	19
Asset/Event Name	Corran Point, Royal Marine Battery
Type of Asset/Event	Coastal Battery (First World War)
Date and/or Period:	
Listing No./NRHE Number	NN06SW 35
HER Number	
Status	Non-designated heritage asset
Easting	201660
Northing	763460
Parish	Ardgour
Council	Highland
Description	World War One Audit of Surviving Remains (5 August 2013) World War One Audit of Surviving Remains A coast battery was established in 1917 to provide protection for the United States ships unloading mines at Corpach, for onward transport by lighter through the Caledonian Canal to the US Naval Base at Inverness. This battery, apparently comprising two 15-pdr and one 7.5-inch howitzer, was situated just to the south of the lighthouse. The guns were positioned on holdfasts set into plain slabs of concrete, without any parapet; ammunition was stored in small wooden lockers. The battery was provided with two small searchlights, mounted on the shore beside a small wooden hut. The battery was manned by Royal Marines. One holdfast is thought to survive beside the war memorial. Traces of a concrete platform which may be the searchlight emplacement was located by the road. Information from HS/RCAHMS World War One Audit Project (GJB) 5 August 2013.

Archaeology Notes
NN06SW 35 centred 0166 6346
This Royal Marine manned coast battery was situated on the S side of Corran Point Lighthouse (NN06SW 14.00). Nothing survives today of the battery, road improvements having obliterated all trace of the site.
The battery is known from a series of photographs which are held in the Royal Marines Museum, Eastney, the images are all labelled Conau Point in error.
J Guy 2000; NMRS MS 810/10, Vol.2, 147, Vol.3, 61.

Activities
Project (March 2013 - September 2013)
A project to characterise the quantity and quality of the Scottish resource of known surviving remains of the First World War. Carried out in partnership between Historic Scotland and RCAHMS.

MyCanmore Text Contributions
"Britain's Sea Soldiers"
20-02-2010
I have been told that the book "Britain's Sea Soldiers" mentions
"Consequent on the entry of the United States into the war, and the more active mining policy then adopted, it became necessary to increase the number of bases for small craft, etc., and to guard them against the possible enterprises of the submarines
For this purpose it was decided to arm the above mentioned places with some guns and searchlights, and the Royal Marines were called on to provide the necessary garrisons.
The general principle was adopted of detailing the RMA to the guns, and the RMLI to the searchlights, but the provision of these garrisons was rather a drain on manning resources."
Mines were shipped into Corpach and Kyle of Lochalsh by the US Navy for the North Sea Barrage.
Contributed by Martin Briscoe

Corran battery
26-01-2010
There is the concrete base of a building on the inland side of the road across from the location of this battery so perhaps there are some remains. Also the Ardgour War Memorial near there is mounted a concrete base with a steel ring that has threaded bolts around it - presumably a holdfast?
Contributed by Martin Briscoe

Asset/Event Number	20
Asset/Event Name	Ardgour, Post Office
Type of Asset/Event	Post Office (19th Century)-(20th Century)
Date and/or Period:	
Listing No./NRHE Number	NN06SW 37
HER Number	
Status	Non-designated heritage asset
Easting	201317
Northing	763988
Parish	Ardgour
Council	Highland
Description	Recording Your Heritage Online Former Post Office, early 19th century Little-altered Telford-style house with two-bay piended block standing proud at one end. Taken from "Western Seaboard: An Illustrated Architectural Guide", by Mary Miers, 2008.

Published by the Rutland Press http://www.rias.org.uk

Asset/Event Number	21
Asset/Event Name	Corran Ferry, Cottages
Type of Asset/Event	Cottages(s) (Period Unassigned)
Date and/or Period:	
Listing No./NRHE Number	NN06SW 32.00
HER Number	
Status	Non-designated heritage asset
Easting	201500
Northing	763770
Parish	Ardgour
Council	Highland
Description	Canmore ID: 105873 Location uncertain, possibly lies within NN06SW NN01 63 Cottage, Innisabhirlinn Architect: Alexander Ross (I.A. May 9, 1873). (Undated) information in NMRS.

Asset/Event Number	22
Asset/Event Name	MHG29822 - Clovullin
Type of Asset/Event	MILL (Post Medieval - 1560 AD to 1900 AD)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG29822
Status	Non-designated heritage asset
Easting	201100
Northing	763300
Parish	Ardgour
Council	Highland
Description	The lade is clearly visible along the Clovullin Road. G Clark, Treslaig (ref 59). The mill itself may have been on the loch edge and so washed away. G Fox, Strontian. AMF, Highland Council, 07/03/01

Asset/Event Number	23
Asset/Event Name	MHG27325 - Stirling Castle: Ardgour, Loch Linnhe
Type of Asset/Event	WRECK (Post Medieval - 1560 AD to 1900 AD)
Date and/or Period:	

Listing No./NRHE Number	
HER Number	MHG27325
Status	Non-designated marine heritage asset
Easting	203186
Northing	768104
Parish	
Council	
Description	NN06SW 8000 0160 6380 N56 43.4 W5 14.7 STIRLING CASTLE, built 1814, stranded at Ardgour, Loch Linnhe. Source; Moir and Crawford 1994 STIRLING CASTLE, at 56 43 20N, 4 14 30W (approximate), Henry Bell's vessel wrecked at Inverscadail near Ardgour in the vicinity of the Coran lighthouse. Source; Baird 1995 Sources/Archives (1) SHG1942 Text/Publication/Volume: Baird, B. 1995. Shipwrecks of the West of Scotland. 261.

Asset/Event Number	24
Asset/Event Name	Onich, fort, Ballachulish
Type of Asset/Event	Prehistoric domestic and defensive: fort (includes hill fort and promontory fort)
Date and/or Period:	
Listing No./NRHE Number	SM2894
HER Number	MHG4313
Status	Scheduled Monument
Easting	202980
Northing	761933
Parish	Ardgour
Council	Highland
Description	From HER: In a commanding situation on a knoll, at NN 0299 6191, are the remains of a dun, sub-rectangular on plan and measuring overall approximately 23.5m NE to SW by 15.0m transversely, with a turf-covered, tumbled stone wall spread to c.5.0m in the SW, c.4.0m in the NE and c.3.0m in the NW. The wall in the SE has mostly tumbled down the slope. No wall faces are evident. Cotton (1954) states, "the defences seem to have been formed by an earth and stone bank 8-10ft high, supporting a slight vitrified wall," but this is dubious. Small amounts of vitrifaction are to be found at the site but the condition of the wall cannot be seen because of the turf. The entrance has been in the N corner at the easiest point of approach. The interior of the dun slopes to the SE and is featureless. Surveyed at 1/2500. M A Cotton 1954; Information from Ms of R Feachem, 1956.

Asset/Event Number	25

Asset/Event Name	MHG4315 - Cists - Corran Ferry
Type of Asset/Event	CIST (Bronze Age - 2400 BC to 551 BC)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG4315
Status	Non-designated heritage asset
Easting	202080
Northing	763370
Parish	Ardgour
Council	Highland
Description	NN06SW 4 0209 6338. At NN 0212 6345, in a gravel knoll above the shore, is a cist, measuring 3'9" by 2', from which a beaker was removed in 1889, with another, 2' by 1', 4' SE of it. The beaker is now at Ardgour House. D Campbell 1890; Information from J N G Ritchie (RCAHMS) 24 March 1970. At NN 0209 6338 are three short cists (A, B and C), oriented NW to SE, each formed by four stones on edge. 'A' and 'B' have been excavated and the interiors remain exposed. 'C' is full of earth with only the tops of the slabs showing. 'A' measures 1.1m by 0.5m internally, and immediately to the N is a prostrate slab c.1.0m long c.0.6m wide, probably the capstone. 'B' measures 0.5m by 0.3m internally. 'C' measures 0.7m by 0.4m internally. The beaker is at present in the NMAS for repair but is expected to be returned to Ardgour House (Information from Miss Maclean, Ardgour House). Surveyed at 1/2500. Visited by OS (R L) 5 May 1970. The beaker is now on display in West Highland Museum. It is described to be from a cist above Nether Lochaber Hotel (Corran Inn), excavated 1889. This inn has since been demolished. WHM1990 17. <1> Sources/Archives (2) --- SHG1267 Text/Publication/Article: Campbell, D. 1890. 'Notice of the discovery of a cist with urn and strike-light at Corran Ferry, Invernesshire', Proc Soc Antiq Scot Vol. 24 1889-90, p.436-8. Proc Soc Antiq Scot. 436-8. 436-8; illust. <1> SHG28510 Text/Record Form/Project Recording Form: 2019. Finds Collection at West Highland Museum. WHM1990 17.

Asset/Event Number	26
Asset/Event Name	MHG22081 - Inchree, Wind Pump
Type of Asset/Event	WIND PUMP (Undated)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG22081
Status	Non-designated heritage asset
Easting	202300
Northing	763390

Parish	Ardgour
Council	Highland
Description	

Asset/Event Number	27
Asset/Event Name	MHG525 - North Slipway, Corran Ferry
Type of Asset/Event	SLIPWAY (Undated)
Date and/or Period:	
Listing No./NRHE Number	NN06SW 11.00
HER Number	MHG525
Status	Non-designated heritage asset
Easting	201640
Northing	763700
Parish	Ardgour
Council	Highland
Description	NN06SW 11 01666 63706 Jetty [NAT] OS (AIB) GIS, April 2008. Location formerly entered as NN 0165 6370. Not to be confused with North Corran, Ardgour Pier (NN 01609 63770), for which see NN06SW 13. For possible loss of vessel (Backwash) at this slipway, see NN06NW 8004. For corresponding slipway (at NN 02133 63546) on E side of the Corran Narrows, see NN06SW 12. References Graham and Gordon, A and J. (1988) 'Old harbours in northern and western Scotland', Proc Soc Antiq Scot, vol. 117, 1987. Page(s): 331, 333

Asset/Event Number	28
Asset/Event Name	NORTH CORRAN, ARDGOUR PIER
Type of Asset/Event	PIER (PERIOD UNASSIGNED)
Date and/or Period:	
Listing No./NRHE Number	NN06SW 13.00
HER Number	
Status	Non-designated heritage asset
Easting	201609
Northing	763770
Parish	Ardgour
Council	Highland
Description	NN06SW 13 01609 63770 Pier [NAT] OS (AIB) GIS, April 2008.

Location formerly entered as NN 0160 6373.
Not to be confused with Corran Ferry, West Slipway (NN1666 63706), for which see NN06SW 11.
Corran of Ardgour Ferry Pier (West Side).
Disused pier
ARCHITECT: Thomas Telford (1803-21).
(Undated) information in NMRS.

Architecture Notes
Corran of Ardgour Ferry Pier (West Side).
Disused pier
ARCHITECT: Thomas Telford. (1803-21)

References
Miers, M. (2008) The Western Seaboard: an illustrated architectural guide. Edinburgh.
RCAHMS Shelf Number: Ref

Asset/Event Number	29
Asset/Event Name	MHG29823 - Camus Aiseig
Type of Asset/Event	SAW MILL (Post Medieval - 1560 AD to 1900 AD); (Alternate Type) GRAIN MILL (Post Medieva
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG29823
Status	Non-designated heritage asset
Easting	200900
Northing	764400
Parish	Ardgour
Council	Highland
Description	There are the remains of two lades in the Manse garden. One, the older, is partly filled with ash and rubbish with building foundations that suggest a Clack mill. The other lade slate-lined is in good condition in places. The Ardgour papers confirm these, there is a suggestion that there was a cloth mill there also, however this may refer to the Clovullin mil (see SMR NN06SW0041). G Clark, Treslaig (ref 60). AMF, Highland Council, 07/03/01

Asset/Event Number	31
Asset/Event Name	FORT WILLIAM TO CORRAN
Type of Asset/Event	BOUNDARY BANK(S) (PERIOD UNKNOWN), BUILDING (PERIOD UNKNOWN), SCOOPED SETTLE
Date and/or Period:	
Listing No./NRHE Number	NN06SW 50.00
HER Number	
Status	Non-designated heritage asset
Easting	202200
Northing	763470
Parish	Kilmallie

Council	Highland
Description	Field Visit (31 July 2020 - 10 August 2020) NN 12210 74170 to NN 02200 63470; NN 12210 74170 to NN 02350 64010 A walkover survey was undertaken between 31 July and 10 August along the routes of two overhead power lines due for refurbishment that run between Fort William and Corran. Two sites previously unrecorded were encountered. At NN 09580 69594 were the substantial remains of a rectangular building and at NN 09739 68350, were remnants of two scooped structures of unknown date with stretches of two boundary banks nearby. Archive and Report: NRHE Funder: SSEN John Lewis – Scotia Archaeology (Source: DES Vol 21) References Lewis, J. (2021) Fort William to Corran, Walkover survey, in Jennifer Thoms, Discovery Excav Scot, New, vol. 21, 2020. Cathedral Communications Ltd, Wiltshire, England. Page(s): 72

Asset/Event Number	32
Asset/Event Name	FORT WILLIAM TO CORRAN
Type of Asset/Event	BOUNDARY BANK(S) (PERIOD UNKNOWN), BUILDING (PERIOD UNKNOWN), SCOOPED SETTLE
Date and/or Period:	
Listing No./NRHE Number	NN06SW 51.00
HER Number	
Status	Non-designated heritage asset
Easting	202350
Northing	764010
Parish	Kilmallie
Council	Highland
Description	Canmore ID: 369915 Field Visit (31 July 2020 - 10 August 2020) NN 12210 74170 to NN 02200 63470; NN 12210 74170 to NN 02350 64010 A walkover survey was undertaken between 31 July and 10 August along the routes of two overhead power lines due for refurbishment that run between Fort William and Corran. Two sites previously unrecorded were encountered. At NN 09580 69594 were the substantial remains of a rectangular building and at NN 09739 68350, were remnants of two scooped structures of unknown date with stretches of two boundary banks nearby. Archive and Report: NRHE Funder: SSEN John Lewis – Scotia Archaeology (Source: DES Vol 21) References Lewis, J. (2021) Fort William to Corran, Walkover survey, in Je

Asset/Event Number	33
Asset/Event Name	MHG58973 - Nether Lochaber WWII Memorial - Innis Na Birlinn Cemetery
Type of Asset/Event	WAR MEMORIAL (20th Century - 1901 AD to 2000 AD)

Date and/or Period:	
Listing No./NRHE Number	NN06SW 45.00
HER Number	MHG58973
Status	Non-designated heritage asset
Easting	202710
Northing	764410
Parish	Kilmallie
Council	Highland
Description	This WWII war memorial is situated at NN 02716 64410. Information from M Briscoe, February 2013 Canmore ID: 320535

Asset/Event Number	34
Asset/Event Name	MHG58971 - Commemorative Monument - Innis Na Birlinn Cemetery
Type of Asset/Event	COMMEMORATIVE MONUMENT (20th Century - 1901 AD to 2000 AD)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG58971
Status	Non-designated heritage asset
Easting	202730
Northing	764400
Parish	Kilmallie
Council	Highland
Description	There is a large memorial to Rev Alex. Stewart in the cemetery at NN 02744 64402. Information from M Briscoe, Februrary 2013

Asset/Event Number	35
Asset/Event Name	MHG37873 - NESS QUEEN: CORRAN NARROWS, LOCH LINNHE
Type of Asset/Event	WRECK (Undated)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG37873
Status	Non-designated marine heritage asset
Easting	201790
Northing	763700
Parish	
Council	Highland
Description	Created automatically by NMRS Register Utility User: Admin, Date: Wed 13 Oct 2004

	---- NN06SW 8006 c. 018 637 N56 43.4 W5 14.4 NLO: Corran Narrows [name: NN 017 632]. The published accounts suggests a location at NN c. 018 637. Information from RCAHMS (RJCM), 10 April 2002. R and B Larn 1998; I G Whittaker 1998.

Asset/Event Number	36
Asset/Event Name	MHG37845 - LORD CLYDE: CORRAN, LOCH LINNHE
Type of Asset/Event	WRECK (Undated)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG37845
Status	Non-designated marine heritage asset
Easting	200990
Northing	762000
Parish	
Council	Highland
Description	Created automatically by NMRS Register Utility User: Admin, Date: Wed 13 Oct 2004 ---- NN06SW 8005 c. 01 62 N56 42 W5 16 NLO: Corran Narrows [name: NN 017 632].

Asset/Event Number	37
Asset/Event Name	MHG47014 - Margaret: Sallachan Point, Loch Linnhe
Type of Asset/Event	WRECK (Undated), SMACK (Unknown date)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG47014
Status	Non-designated marine heritage asset
Easting	199000
Northing	761400
Parish	
Council	Highland
Description	NMRS Report: (27/01/2005) NM96SE 8001 c. 990 614 N56 42.1 W5 17

NLO: Sallachan Point [name: NM 990 614]
Loch Linnhe [name centred NM 86 47]
Corran Narrows [name: NN 017 632]
North Ballachulish [name centred NN 055 605]
South Ballachulish [name centred NN 051 950].

15 December 1874, MARGARET, 29 yrs old, of Glasgow, smack, 39 tons, 2 crew, departed Glasgow for Fort William, carrying coal, stranded, partial loss, 2 lives lost, wind NE4, Sallachan Point, near Corran Light.
Source: PP Abstracts Returns of Wrecks and Casualties on Coasts of the UK 1874 - 75 (1875 [C.1341] LXX.501).

Fort William, 18th Dec., 3.55 p.m., the MARGARET (smack) was wrecked opposite Ballachulish on the 15th Dec.: crew drowned. The body of the master was recovered and buried today. Full salvage has been effected.
Source: Shipping Intelligence, LL, No. 18,927, London, Saturday December 19 1874.

Fort William, 19th Dec., the wreck of the MARGARET is nearly discharged. [Record received incomplete].

NMRS, MS/829/69 (no. 2561).

(Classified as smack: no cargo specified but date of loss cited as 15 December 1874). This vessel was wrecked opposite Ballachulish.
I G Whittaker 1998.

Asset/Event Number	38
Asset/Event Name	MHG34238 - BELLA: BALLACHULISH BAY, LOCH LINNHE
Type of Asset/Event	WRECK (Undated)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG34238
Status	Non-designated marine heritage asset
Easting	203990
Northing	760000
Parish	
Council	Highland
Description	Created automatically by NMRS Register Utility User: Admin, Date: Wed 13 Oct 2004 ---- NN06SW 8004 c. 04 60 N56 41 W5 12 Formerly recorded as NN05NE 8002 at cited location NN 0780 5850 [N56 40.7 W5 8.2] and NN c. 07 58 [N56 40 W5 9]. Possibly on map sheet NN05NW. Ballachulish Bay is not specifically noted on the 1998 edition of the OS 1:50,000 map, but the text of the Hydrographic Office entry to NMRS NN06SW 8001 suggests that the name applies to the area of Loch Linnhe in front of North Ballachulish village [North Ballachulish: NN 080 585] and to the N of the entrance to Loch Leven. Information from RCAHMS (RJCM), 22 March 2002.

Asset/Event Number	39
Asset/Event Name	BANSHEE: LOCH LINNHE
Type of Asset/Event	CRAFT (19TH CENTURY)
Date and/or Period:	
Listing No./NRHE Number	NN06NW 8002.00
HER Number	
Status	Non-designated marine heritage asset
Easting	201000
Northing	766000
Parish	Ardgour
Council	Highland
Description	Canmore ID: 255294 NN06NW 8002 unlocated NLO: Corran Narrows [name: NN 017 632] Loch Linnhe [name centred NM 86 47] Fort William [name: NN 105 740]. Fort William, Inverness, 19th Dec [1857]. The BANSHEE, of Glasgow, Gardner, from Inverness to Corran, in ballast, sank on the 13th Dec., about 4 miles South of this place, after being in contact with the JAMES, Findlay, from Cromarty to Liverpool, which received considerable damage: the crew of the BANSHEE were saved. [Record received incomplete]. NMRS, MS/829/72 (no. 9444). (No classification or cargo specified: date of loss cited as 13 December 1857). Banshee: this vessel was in collision and sank 4 miles south of Fort William (James). Capt. Gardner. Registration: Glasgow. (Location of loss cited as N56 45.0 W5 15.0). I G Whittaker 1998. The map sheet assigned to this record is essentially tentative. The vessel was evidently lost between Fort William and the Corran Narrows, being derived from the unverified location that is cited by Whittaker. Information from RCAHMS (RJCM), 3 October 2003. Activities Reference (2011) Project Adair - Whittaker data upload Whittaker ID : 13995 Name : BANSHEE Latitude : 564500 Longitude : 51500 Date Built : 1849 Registration : LIVERPOOL Type : SCHOONER Tonnage : 155 Tonnage Code : B Loss Day : 13 Loss Month : 12 Loss Year : 1857 Comment : Collision and sunk 4 miles south of Fort William (JAMES). Capt. Gardner References Whittaker, I G. (1998) Off Scotland: a comprehensive record of maritime and aviation losses in Scottish waters. Edinburgh. Page(s): 290 RCAHMS Shelf Number: E.5.14.WHI

Asset/Event Number	40
Asset/Event Name	BACKWASH: LOCH LINNHE
Type of Asset/Event	CRAFT (20TH CENTURY)
Date and/or Period:	
Listing No./NRHE Number	NN06NW 8004.00
HER Number	
Status	Non-designated marine heritage asset
Easting	201634
Northing	763707
Parish	Ardgour
Council	Highland
Description	Canmore ID: 293693 NRHE Coordinates: 202400 767200 Moved to Ardgour Slip (Asset 62) NN07SE 8001 c. 075 723 N56 27 W5 26 (Classified as Fishing Vessel: registration number cited as GY 1299, and date of loss as 30 November 1921). Backwash: this vessel was wrecked on Ardgour Slip. (This Ardgour?). Registration: Grimsby. Built 1917. 98grt. Length: 27m. Beam: 6m. (Location of loss cited as N56 45.50 W5 14.0). I G Whittaker 1998. The map sheet assigned to this record is essentially arbitrary, being derived from the unverified location of loss that is cited by Whittaker. The location of 'Ardgour Slip' is unclear, but the title may refer to the slipway (NN06SW 11) on the W side of the Corran Narrows (at NN 01666 63706). Information from RCAHMS (RJCM), 2 April 2008. Activities Reference (2011) Project Adair - Whittaker data upload Whittaker ID : 1808 Name : BACKWASH (GY 1299) Latitude : 564530 Longitude : 51400 Date Built : 1917 Registration : GRIMSBY Type : FV (WOOD) Tonnage : 98 Tonnage Code : G Length : 27 Beam : 6 Draught : 3m Loss Day : 30 Loss Month : 11 Loss Year : 1921 Comment : Wrecked on Ardgour Slip. (This Ardgour?) References Whittaker, I G. (1998) Off Scotland: a comprehensive record of maritime and aviation losses in Scottish waters. Edinburgh. Page(s): 290 RCAHMS Shelf Number: E.5.14.WHI

Asset/Event Number	41
Asset/Event Name	MHG47029 - Christiania: Corran Ferry, Loch Linnhe
Type of Asset/Event	WRECK (Undated), SCHOONER (Unknown date)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG47029
Status	Non-designated marine heritage asset
Easting	201000
Northing	763000
Parish	
Council	Highland
Description	NMRS Report: (20/09/2006 11:34:11) NN06SW 8009 c. 01 63 N56 43 W5 15 NLO: Corran Narrows [name: NN 017 632] Loch Linnhe [name centred NM 86 47] Fort William [name: NN 105 740]. Inverness, 12th June. The CHRISTIANA, Taylor, of Nairn, for Liverpool, took fire near Fort William on the 9th June, supposed from the overheating of the cabin stove, and burnt to the water's edge: cargo, fir staves, entirely consumed. Source: The Marine List, LL, No. 11,615, London, Saturday June 14 1851. NMRS, MS/829/72 (no. 8686). (Classified as wooden schooner, with cargo of staves: date of loss cited as 9 June 1851). Christina: this vessel burnt at Corran Ferry. Capt. Taylor. Registration: Nairn. Built 1841. 90 tons register. (Location of loss cited as N56 43.0 W5 15.0). I G Whittaker 1998.

Asset/Event Number	41
Asset/Event Name	MHG47018 - Soho: Corran Rocks, Loch Linnhe
Type of Asset/Event	WRECK (Undated), SCHOONER (Unknown date)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG47018
Status	Non-designated marine heritage asset
Easting	201000
Northing	763000
Parish	
Council	Highland
Description	NMRS Report: (27/01/2005) NN06SW 8008 c. 01 63

N56 43 W5 15

See also NN18SE 8001.

NLO: Corran Narrows [name: NN 017 632]
Loch Linnhe [name centred NM 86 47].

Fort William, N.B., 7th Feb., the schooners VICTORY and SOHO are now lying at Gairlochy (Caledonian canal) with their cargoes (barley) much damaged, and will have to discharge.
Source: Shipping Intelligence, LL, No. 18,660, London, Tuesday February 10 1874.

Fort William, 8th Feb., the SOHO (schr.), McGregor, bound to Islay, with barley, reported yesterday as lying at Gairlochy with damage, is now on the Corran rocks, and likely to become a wreck: the wind is from the East, causing an increase of danger. [Record received incomplete].

NMRS, MS/829/70 (no. 4063).

(Classified as schooner, with cargo of barley: date of loss cited as 8 February 1874). This vessel is stranded on Corran rocks and expected wreck.
I G Whittaker 1998.

Corran Rocks are not noted as such on the 1998 edition of the OS 1:50,000 map.
Information from RCAHMS (RJCM), 10 April 2002.

Asset/Event Number	43
Asset/Event Name	MHG50054 - Unknown: Corran Ferry, Loch Linnhe
Type of Asset/Event	WRECK (Undated), SCHOONER (Unknown date)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG50054
Status	Non-designated marine heritage asset
Easting	201000
Northing	763000
Parish	
Council	Highland
Description	NMRS Report: (29/11/2006 15:11:11) NN06SW 8013 c. 01 63 N56 43 W5 15 NLO: Corran Narrows [name: NN 017 632] Loch Linnhe [name centred NM 86 47] Fort William [name: NN 105 740] Oban [name: NM 862 303]. Greenock, 6th Oct. Two large schooners, have gone ashore at the Corrans, Oban, one of them with 100 tons of freestone. Source: The Marine List, LL, No. 14,512, London, Monday October 8 1860. NMRS, MS/829/72 (no. 9904). The loss of these vessels is not cited by I G Whittaker (1998), presumably suggesting their successful recovery. Information from RCAHMS (RJCM), 29 November 2006.

Asset/Event Number	44
Asset/Event Name	MHG50314 - Gazelle: Corran Ferry, Loch Linnhe
Type of Asset/Event	WRECK (Undated), SCHOONER (Unknown date)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG50314
Status	Non-designated marine heritage asset
Easting	201000
Northing	763000
Parish	
Council	Highland
Description	NMRS Report: (24/01/2007 16:46:50) NN06SW 8014 c. 01 63 N56 43 W5 15 NLO: Corran Narrows [name: NN 017 632] Loch Linnhe [name centred NM 86 47] Fort William [name: NN 105 740] Oban [name: NM 862 303]. Oban, 25th Nov. The GAZELLE (schr.), of Dundee, McLoan, from Birkenhead to Tayport, with guano, is reported as having struck on a rock off South Corran. Source, LL, No. 17,665, London, Tuesday, November 29 1870. Glasgow, 26th Nov. The GAZELLE, McLean, from Birkenhead to Tayport, reported yesterday as having struck on a rock off South Corran, has parted amidships and become a total wreck. Source, LL, No. 17,666, London, Wednesday, November 30 1870. Dundee, 3rd Dec. The cargo of the GAZELLE, from Birkenhead to Tayport, reported, 25th Nov., as wrecked off South Corran, is being brought ashore. Source, LL, No. 17,671, London, Tuesday, December 6 1870. NMRS, MS/829/72 (no. 11878). (No classification or cargo specified: date of loss cited as 25 November 1870). Gazelle: this vessel hit rocks at South Corran, and broke in two. Capt. McLean. (Location of loss cited as N56 43.25 W5 14.5). I G Whittaker 1998. The location assigned to this record is essentially arbitrary. South Corran is not noted as such on the 1998 edition of the OS 1:50,000 map. Information from RCAHMS (RJCM), 24 January 2007.

Asset/Event Number	45
Asset/Event Name	MHG52101 - UNKNOWN: CORRAN FERRY, LOCH LINNHE
Type of Asset/Event	WRECK (19th Century - 1801 AD to 1900 AD), SCHOONER (Unknown date)
Date and/or Period:	

Listing No./NRHE Number	
HER Number	MHG52101
Status	Non-designated marine heritage asset
Easting	201000
Northing	763000
Parish	
Council	Highland
Description	NN06SW 8016 c. 01 63 N56 43 W5 15 NLO: Corran Narrows [name: NN 017 632] Loch Linnhe [name centred NM 86 47] Oban [name: NM 862 303]. See also NN06SW 8013 and 8017. Greenock, 6th Oct. Two large schooners, have gone ashore at the Corrans, Oban, one of them with 100 tons of freestone. Source: The Marine List, LL, No. 14,512, London, Monday October 8 1860. NMRS, MS/829/72 (no. 9904). (Classified as schooner, with cargo of freestone: date of loss cited as 6 October 1860). Unknown: second of two schooners sranded at Corran. (Location of loss cited as N56 43.0 W5 15.0). I G Whittaker 1998. The location assigned to this record is essentially tentative. Information from RCAHMS (RJCM), 2 April 2008. <1>

Asset/Event Number	46
Asset/Event Name	MHG52102 - UNKNOWN: CORRAN FERRY, LOCH LINNHE
Type of Asset/Event	WRECK (19th Century - 1801 AD to 1900 AD), SMACK (Unknown date)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG52102
Status	Non-designated marine heritage asset
Easting	201000
Northing	763000
Parish	
Council	Highland
Description	NN06SW 8017 c. 01 63 N56 43 W5 15 NLO: Corran Narrows [name: NN 017 632] Loch Linnhe [name centred NM 86 47] Oban [name: NM 862 303]. See also NN06SW 8013 and 8016. (Classified as smack: no cargo specified, but date of loss cited as 6 October 1860). Unknown: this vessel stranded at Corran (along with two schooners). (Location of loss cited as N56 43.0 W5 15.0). I G Whittaker 1998. The location assigned to this record is essentially tentative. Information from RCAHMS (RJCM), 2 April 2008. <1>

Asset/Event Number	47
Asset/Event Name	MHG52123 - INVERNESS: LOCH LINNHE
Type of Asset/Event	WRECK (19th Century - 1801 AD to 1900 AD), SLOOP (Unknown date)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG52123
Status	Non-designated marine heritage asset
Easting	201000
Northing	763000
Parish	
Council	Highland
Description	NN06SW 8015 unlocated NLO: Corran Narrows [name: NN 017 632] Loch Linnhe [name centred NM 86 47]. (Classified as sloop: no cargo specified, but date of loss cited as December 1858). Inverness: this vessel was lost off Corran Ferry [Corran Narrows]. Registration: Inverness. Built 1842. 19 tons burthern. Length: 11m. Beam: 4m. (Location of loss cited as N56 52.0 W5 5.0). I G Whittaker 1998. The map sheet assigned to this record is essentially arbitrary. The vessel presumably foundered. Information from RCAHMS (RJCM), 20 March 2008. <1>

Asset/Event Number	49
Asset/Event Name	MHG48573 - Albert: Corran Ferry, Loch Linnhe
Type of Asset/Event	WRECK (Undated), CRAFT (Unknown date)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG48573
Status	Non-designated marine heritage asset
Easting	201000
Northing	763000
Parish	
Council	Highland
Description	NMRS Report: (21/06/2005) NN06SW 8011 c. 01 63 N56 43 W5 15 NLO: Corran Narrows [name: NN 017 632] Loch Linnhe [name centred NM 86 47] Fort William [name: NN 105 740]. Inverness, 23rd Oct. The ALBERT, of Kirkwall, from Arklow to Newcastle (with sulphur ore), went ashore at Corran Ferry, 16th Oct.: cargo discharging. Source: The Marine List, LL, No. 11,729, London, Saturday October 25 1851. NMRS, MS/829/72 (no. 8702).

The loss of this vessel is not cited by I G Whittaker (1998), presumably suggesting her successful recovery.
Information from RCAHMS (RJCM), 21 June 2005.

Asset/Event Number	50
Asset/Event Name	MHG48694 - Flora: Corran Ferry, Loch Linnhe
Type of Asset/Event	WRECK (Undated), SLOOP (Unknown date)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG48694
Status	Non-designated marine heritage asset
Easting	201000
Northing	763000
Parish	
Council	Highland
Description	NMRS Report: (19/08/2005) NN06SW 8012 c. 01 63 N56 43 W5 15 NLO: Corran Narrows [name: NN 017 632] Loch Linnhe [name centred NM 86 47] Fort William [name: NN 105 740]. Aberdeen, 8th Jan. The sloop FLORA, of Inverness, bound to that port and Banff, (with slates & guano) was run into by the steamer DUNTROON CASTLE, 20th ult., whilst at anchor, in Corran Ferry, and immediately sank: crew saved. Source: The Marine List, LL, No. 10,550, London, Monday January 10 1848. NMRS, MS/829/72 (no. 8292). (Classified as sloop, with cargo of slates and guano: date of loss cited as 20 December 1847). Flora: this vessel was run down at anchor, and sank at Corran ferry (DUNTROON CASTLE). Registration: Inverness. Built 1819. 49 tons burthern. Length: 16m. Beam: 5m. (Location of loss cited as N56 44.0 W5 15.0). I G Whittaker 1998.

Asset/Event Number	51
Asset/Event Name	Ardgour House
Type of Asset/Event	Country House
Date and/or Period:	
Listing No./NRHE Number	LB1687
HER Number	
Status	Category B Listed Building
Easting	199545
Northing	763836

Parish	Ardgour
Council	Highland
Description	1765, reconstructed after fire, 1825. Centre 3-storey, 5-bay symmetrical south front (shell dates from 1765) with 2-storey, wide single bay wings at east and west gables. All harled with polished and tooled ashlar margins and dressings. Centre door with round-headed fanlight and narrow side lights, masked by 1825 balustraded portico supported by monolith Roman Doric columns. Rusticated quoins; moulded eaves cornice. Blocking course, stepped and raised in centre (1825). Hipped end stacks; piended platform slate roof; projecting rear stairwell. 1825 side wings slightly set back, and extending to rear to form shallow U-plan court, now largely infilled. Corniced tripartites in ground floor of south fronts, wide 3-bay flanks. Tall ridge stacks; piended slate roofs with projecting eaves. 2 and 12-pane glazing; some lattice pane glazing to rear. Interior: though the original stairwell, and possibly the stairs, survive, the remainder of the interior of the mansion dates from 1825, as does the cusped decorative cast-iron staircase balustrade with polished wooden handrail. 1825 ground floor dining room and sitting room chimney pieces of polished sandstone. Panelled and beaded doors and shutters; moulded doorcases. 1st floor drawing room with decorative plaster cornice and central rose; chimney piece with cusped detailing; panelled and beaded window shutters and doors; moulded doorcases. Decorative plaster rose to stairwell ceiling. Statement of Special Interest Family home of MacLean of Ardgour, established at Coull (as site was called until 18th century) since 1542. Present house built 1765 by Hugh MacLean, 12th Earl of Ardgour, and reconstructed in 1825 after extensive fire damage by Hugh's son, Alexander, in 1825. Centre block is shell of original house, which was gabled. 1765 mansion on site of former house. References Bibliography Royal Commission on Ancient and Historic Monuments of Scotland, ARGYLL iii (1980) pp. 227-8.

Asset/Event Number	52
Asset/Event Name	ARDGOUR HOUSE
Type of Asset/Event	Garden and Designed Landscape
Date and/or Period:	
Listing No./NRHE Number	GDL00020
HER Number	
Status	Garden and Designed Landscape
Easting	199832
Northing	763570
Parish	Ardgour
Council	Highland
Description	A good example of an intact 18th century parkland design that relates well to its dramatic setting. There is a notable rhododendron collection here, and Ardgour has a long association with the MacLean family. Type of Site 18th century parkland.

Main Phases of Landscape Development
Mid 18th century parkland landscape, with later additions including 19th century kitchen garden.

Artistic Interest
Level of interest
High
This is a fine example of an 18th century picturesque landscape, designed to exploit a dramatic setting, the site thereby has high value as a Work of Art.

Historical
Level of interest
High
The high Historical value of the site is based on its long association with the MacLean family and its relatively unchanged, stable layout.

Horticultural
Level of interest
High
The 18th century specimen parkland trees and Rhododendron collection give the site high Horticultural significance.

Architectural
Level of interest
High
The designed landscape is of high value architecturally as it provides an integral setting for Ardgour House, and is part of an overall concept.

Archaeological
Level of interest
Little
The archaeological importance of the site is relatively unknown.

Scenic
Level of interest
High
The dramatic setting of the designed landscape on the shores of Loch Linnhe makes this site of high Scenic merit.

Nature Conservation
Level of interest
High
The site incorporates many varied habitats including pasture, woodland and ancient trees making it of high Nature Conservation value.

Location and Setting
Ardgour House is situated 2.5km (1.6 miles) west of Corran Ferry, on the north shores of Loch Linnhe. The main entrance to the policies lies at the west end of the village of Clovullin, which itself lies 0.5km off the A861.
The estate extends across a narrow low-lying plain contained between the steep loch sides and open water. Due to its narrow spatial extent within the glen, the settled edge of the loch is a major influence on the landscape character and experience of the site. The house, 1.3km north of Loch Linnhe, is surrounded by rhododendron and other ornamentals providing a lush, sheltered character.
Principal views from the house lead southwards to Loch Linnhe but important views from the site lie north-eastwards to the cascading falls of Tubhailt Mhic ic Eoghain ('MacLean's Towel'). This is formed by the confluence of the innumerable burns which fall off Sgurr na h Eanchainne (B). Sgurr na h Eanchainne (730m) directly to the north, forms the landscape backdrop to views out of the landscape.
The extent of the designed landscape has changed a little since the 18th century, primarily in the extent of parkland to the south of the House which had doubled by 1900 (Roy, 1747-55;

1871-2, OS 6"; 1897, OS 6").
Of particular note is Blàr Cladh A' Mhuilinn, to the west of the parkland, which by 1850 had been set out with a regular drainage system (1871-2, OS 6"). This was probably an attempt to provide better pasturage in the enclosures at the foot of Coille na Cuile, and may indicate a long-term intention to extend the parkland even further westwards.

Site History
Until the 18th century, the small mansion, the principal messuage of the barony of Ardgour, was known as Cùil or Coull and appears on Roy's map of c 1750. In 1763, Hugh MacLean of Ardgour obtained estimates for quarrying sandstone near Kinlochaline and then, in 1765, entered into a contract for building a new house for £611 8s. The work was undertaken by John Menelaws and David Gridwood, the latter a Glasgow wright employed by MacLean at another of his properties at Williamwood, Renfrewshire.
A fire in September 1825 gutted the House and it was reconstructed by Hugh's son, Alexander MacLean. Only the principal stair survived, so the interior was completely remodelled and flanking wings were added by the builder-architect Alexander Squair. The rebuilding was finally completed in 1830 at a cost of £4,124. Two pencil sketches of c 1850 show the House in its landscape setting, and there appears to have been little change since. The estate remains in private ownership although, since the early 1990s, the house and pleasure grounds are in separate ownership.

Landscape Components
Architectural Features
Ardgour House a piend-roofed three-storey, five-bay block, was built in 1765; the interior was rebuilt 1825-30 and flanking wings added. It is harled with dressed ashlar margins and dressings.
The Home Farm, a three-sided building around a central courtyard, lies north-west of Ardgour House. It is two-storeys with a harled elevation and slate roofs. Estate cottages, called the High Houses are also located north-west of the house.

Drives & Approaches
The principal approach is from Clovullin, where an entrance drive leads north-west of the school and along the southern edge of the Allt an Àilein valley. This drive leads to the south front of the house.
A secondary drive leads from Sallachan, by the River Gour at Cama Shallachain, north-west along the foot of Coille na Cuile to the House. Other drives link the various elements of the estate including the Home Farm, Cottages and Kitchen Garden.

Parkland
North of the house an area of rough pasture extends up to the foot of the hills and is scattered with mature specimen trees.
South of the house, a broad swathe of parkland forms a contrast with rougher grazed pasture beyond. The parkland trees are fine specimens of lime, oak, and horse chestnut. Some lengths of rubble retaining walls define the parkland. To the west the parkland is bounded by the Allt an t Síthein (the Fairy Burn).

Woodland
The mixed woodland on Coille na Cuile forms a magnificent backdrop to Ardgour House. The extent of the woodland corresponds to that in the 19th and 20th centuries (1871-2, OS 6"; 1897, OS 6").
South-west of the house is a coniferous plantation, which at this distance has little impact on the setting of the House.

The Gardens
To the east of the House is an area of over-mature ornamental planting, surrounded to the north, east and south by the entrance drives, with the House to the west. The planting includes monkey-puzzle, and large leafed Rhododendrons. The ornamental walk continues to the Kitchen Garden, with a mature Atlantic cedar and more large species of Rhododendrons.
Lady Margaret's Cave lies in the mountainside behind Ardgour House.

Walled Gardens
A track, now abandoned, led north-east from the house, over a bridge across the Allt an Àilein through a plantation to the Kitchen Garden. The enclosure consisted of low rubble walls and now overgrown, derelict hedges.
Within the enclosure is an area of overgrown box hedging surrounding a 20th century concrete-framed glasshouse. To the south-west of this area was a tree nursery.

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Asset/Event Number	53
Asset/Event Name	ONICH, WALLED GARDEN CUILCHEANNA HOUSE
Type of Asset/Event	Walled Garden
Date and/or Period:	
Listing No./NRHE Number	LB7076
HER Number	
Status	Category B Listed Building
Easting	202009
Northing	761719
Parish	Kilmallie
Council	Highland
Description	Probably of early 19th century date. Large walled enclosure, 3 sides of unusually fine dry-stone construction composed of large, split granite blocks in regular courses, pinned with narrow slate courses. Original entrance in west wall, 4th wall of later date, rubble built with two modern breaches. Statement of Special Interest Cuilcheanna House now too altered to list. Exceptional quality of drystone walling in local style and tradition.

Asset/Event Number	54
Asset/Event Name	MHG40095 - South Slipway, Corran Ferry

Type of Asset/Event	SLIPWAY (Undated)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	MHG40095, MHG4312
Status	Non-designated heritage asset
Easting	202100
Northing	763540
Parish	Kilmallie
Council	Highland
Description	Canmore ID: 23577 Architect: Thos. Telford (1803-1821)

Asset/Event Number	55
Asset/Event Name	EHG5704 - Watching brief - Underground Cabling, Corran Narrows
Type of Asset/Event	Watching Brief
Date and/or Period:	
Listing No./NRHE Number	
HER Number	EHG5704
Status	Event
Easting	201440
Northing	763520
Parish	Ardgour
Council	Highland
Description	Organisation: Clyde Archaeology Dates: June 2021- Feb 2022 Centred NN 0144 6352 (1552m by 777m) (3 map features) An archaeological watching brief was undertaken by Clyde Archaeology in 2021-22 on behalf of Cnoclee Environmental Services as part of a series of mitigation measures to minimise any impact a new subsea cable could have on the historic environment. The cable was installed by Scottsh and Southern Electricity Networks across the Corran Narrows, Highland. The watching brief was undertaken on the land connections. The majority of the underground cable route comprised deep peat which, in most cases extended beyond the 1 to 1.2m depth of the cable trench. The exception to this was at the eastern and western ends of the underground cable on the Ardgour side where topsoil was present on top of the natural subsoil. No significant archaeological remains were uncovered. <1>

Asset/Event Number	56
Asset/Event Name	Agricultural Trailer
Type of Asset/Event	Agricultural Trailer
Date and/or Period:	
Listing No./NRHE Number	

HER Number	
Status	Walkover Survey Asset
Easting	202337
Northing	763866
Parish	
Council	
Description	The remains of a wooden agricutural trailer are visible from the west side of the modern of the modern A82 within a wooded area. The trailer consists of the remains of a slight barelled wooden roof with wooden frame and a supporting metal frame. The towbar is still present. The trailer appears to be an example that was probably harnessed to horses and may date to the first half of the twentieth century.

Asset/Event Number	57
Asset/Event Name	Ruined Enclosure
Type of Asset/Event	Ruined Enclosure
Date and/or Period:	
Listing No./NRHE Number	
HER Number	
Status	Walkover Survey Asset
Easting	202278
Northing	763816
Parish	
Council	
Description	Unroofed building depicted on First Edition Ordnance Survey Map that was surveyed in 1870 and published in 1874. Building survives as ruins of dry stone walling up to four courses high with some tumbled down layers. Mature trees are growing in and around this enclosure. A possible entranceway was observed on its eastern side. There was no discernible evidence of a roof fitting; this enclosure possibly functioned as an animal enclosure. Overgrown metal fixtures to the north of this enclosure probably represent the remains of farm machinery, vehicles and tools. Sources Ordnance Survey, 1874, Inverness-shire (Mainland), Sheet CLXV (with inset CLIX), Surveyed: 1870, Published: 1874

Asset/Event Number	58
Asset/Event Name	Pair of Metal Rings
Type of Asset/Event	Pair of Metal Rings
Date and/or Period:	
Listing No./NRHE Number	
HER Number	

Status	Walkover Survey Asset
Easting	202197
Northing	763765
Parish	
Council	
Description	Two metal rings were recorded at this location bolted in to a prominent rock on a north to south alignment. The rock is called An Dulan on historical OS maps. These rings are possibly related to wartime defences; they may be anchoring points for boom net defences. A further ring bolt to the south near the modern slipway may be associated with Asset 60, demolished pier, although it could also be related to wartime defences. Sources Ordnance Survey, 1874, Inverness-shire (Mainland), Sheet CLXV (with inset CLIX), Surveyed: 1870, Published: 1874

Asset/Event Number	59
Asset/Event Name	Miscellaneous Iron Pieces/ceramucs
Type of Asset/Event	Miscellaneous Iron Pieces/ceramics
Date and/or Period:	
Listing No./NRHE Number	
HER Number	
Status	Walkover Survey Asset
Easting	202357
Northing	763949
Parish	
Council	
Description	Area of miscellaneous iron items that have probably been washed out of situ due to coastal erosion. These pieces included iron bolts. The bolts have the feel of wartime bolts, possibly for pinning a gun mount in place. Similar metal fragments also have the feel of wartime defences rather than items off of a ship or a bolt. It should be noted that one iron fragment has a clearly identifiable trailer hook and this probably represents the remains of an agricultural farm trailer. One ceramic sherd, possibly dating to the early 20th century was also recorded within this area.

Asset/Event Number	60
Asset/Event Name	Pier? (Demolished)
Type of Asset/Event	Pier? (Demolished)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	
Status	Walkover Survey Asset

Easting	202155
Northing	763581
Parish	
Council	
Description	Just to the north of the current RO/RO slipway the sight of a previous pier was recorded. A concrete stub of this pier survives with a portion of a rusted metal girder. The state of the rust on the metal girder suggested that it had not been exposed to the degree that exposed metal girders from both world wars are typically subjected to. Hydrographic Officer charts show that this pier was still extant in 1962. However, by the time of the Ordnance Survey map that was surveyed in 1972 and copyrighted in 1973 this slip had been removed, possibly to allow for larger RO/RO ferries to access the southern slipway (Asset 54). A ring bolt nearby may be associated with Asset 60, demolished pier, although it could also be related to wartime defences. Sources Ordnance Survey, 1874, Inverness-shire (Mainland), Sheet CLXV (with inset CLIX), Surveyed: 1870, Published: 1874 Hydrographic Office, Scotland – west coast – Ballachulish Bay, Revised: to 1962 Ordnance Survey, NN0263, Surveyed: 1972, Copyright: 1973

Asset/Event Number	61
Asset/Event Name	Ramps
Type of Asset/Event	Ramps
Date and/or Period:	
Listing No./NRHE Number	
HER Number	
Status	Walkover Survey Asset
Easting	202224
Northing	763656
Parish	
Council	
Description	Deteriorating ramps constructed out of stone were recorded on the elevated section of the foreshore near modern dwellings. These ramps are really noticeable when viewed from the west side of the Corran narrows: they are likely to have been used for installation of the services that cross the narrows at this point.

Asset/Event Number	62
Asset/Event Name	Earlier Hards/slipways
Type of Asset/Event	Hard/Slipway
Date and/or Period:	
Listing No./NRHE Number	
HER Number	
Status	Walkover Survey Asset
Easting	201634

Northing	763707
Parish	201626
Council	763722
Description	The remnants of previous slipways/hards survive butting up against the north side of the modern slipway. There are at least two phases of building material present in this feature. An earlier phase, that butts up against the modern slip[way consists of cobbled stones. The outer northern phase, which appears to be later is formed of concrete.

Asset/Event Number	63
Asset/Event Name	Boat Maintenance/Breaking Area
Type of Asset/Event	Boat Maintenance/Breaking Area
Date and/or Period:	
Listing No./NRHE Number	
HER Number	
Status	Walkover Survey Asset
Easting	201626
Northing	763722
Parish	
Council	
Description	An area of small boat maintenance or breaking is present just to the north of the earlier hard/slipway at Asset 62; a natural place for such activities to be taking place. The items recorded including rusted ship fittings. Some of these items are almost completely buried within the stony matrix of the inter-tidal zone.

Asset/Event Number	64
Asset/Event Name	Scottish Waters Outlet
Type of Asset/Event	Modern Service
Date and/or Period:	
Listing No./NRHE Number	
HER Number	
Status	Walkover Survey Asset
Easting	201512
Northing	763874
Parish	
Council	
Description	A modern Service leads from a metalled area with modern service cabinets on the foreshore out into the inter-tidal zone. A valve and a warning marker are present at its seaward outline. The buried service is protected by an overlay of concrete blocks in a rock armour formation.

Asset/Event Number	65
Asset/Event Name	Pier (Demolished)
Type of Asset/Event	Pier (Demolished)
Date and/or Period:	
Listing No./NRHE Number	
HER Number	
Status	Walkover Survey Asset
Easting	201582
Northing	763745
Parish	
Council	
Description	Material that could be associated with a previous demolished phase of Ardgour Pier (Asset 28) was recorded during the walkover survey.

Asset/Event Number	66
Asset/Event Name	Blocked Access
Type of Asset/Event	Blocked Access
Date and/or Period:	
Listing No./NRHE Number	
HER Number	
Status	Walkover Survey Asset
Easting	201603
Northing	763718
Parish	
Council	
Description	Along the seawall a blocked off access route to the inter-tidal zone was observed (Asset 65).

Asset/Event Number	67
Asset/Event Name	Groyne
Type of Asset/Event	Modern Groyne
Date and/or Period:	
Listing No./NRHE Number	
HER Number	
Status	Walkover Survey Asset
Easting	201677
Northing	763674
Parish	
Council	

Description	A modern groyne was recorded south of the slipway in the West Site. It was noticeable how effective this groyne was of keeping the beach area between it and the slipway clear of stones.

Asset/Event Number	68
Asset/Event Name	
Type of Asset/Event	Watching Brief
Date and/or Period:	
Listing No./NRHE Number	
HER Number	EHG5704
Status	Event
Easting	200680
Northing	763900
Parish	Lochaber
Council	Highland
Description	Organisation: Clyde Archaeology Dates: June 2021 Centred NN 0068 6390 (64m by 37m) (2 map features) An archaeological trial trench evaluation was undertaken by Clyde Archaeology in 2021 on behalf of Cnoclee Environmental Services as part of a series of mitigation measures to minimise any impact a new subsea cable, being installed by Scottish and Southern Electricity Networks across across the Corran Narrows, could have on the historic environment. The works concentrated on an area of underground cable route west of Ardgour that had been identified as having high potential to contain buried archaeological remains due to its close proximity to a large cairn. A total of five trial trenches were excavated at the western end of the southern cable where it ran closest to the cairn while two test pits were excavated slightly further to the west to assess whether peat deposits had the potential to hold significant palaeoenvironmental remains. No archaeological remains were uncovered in the trial trenches while a linear pile of stone forming a rough boundary was found to sit on top of the peat and was not considered archaeologically important. Two test pits excavated into the peat close to the cairn found that it lay to 0.8m in depth. Further detailed palaeoenvironmental analysis was not recommended as the peat was shallower than expected and it showed no obvious changes in composition suggesting it could be very decomposed.

Pell Frischmann

Corran Ferry Infrastructure Improvement Scheme

Appendix P.1: Transport Assessment

Affric making it happen

Wallace Stone Consulting Civil Engineers

The Highland Council Comhairle na Gàidhealtachd

Pell Frischmann

Corran Ferry Infrastructure Improvement Scheme

Transport Assessment

February 2025

108168

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1 Introduction

1.1 Purpose of the Report

Pell Frischmann (PF) has been commissioned by Wallace Stone LLP. to undertake a Transport Assessment (TA) for the proposed Corran Ferry Infrastructure Improvement Scheme (hereafter referred to as the CFIIS) at Corran Narrows within The Highland Council (THC) administrative area.

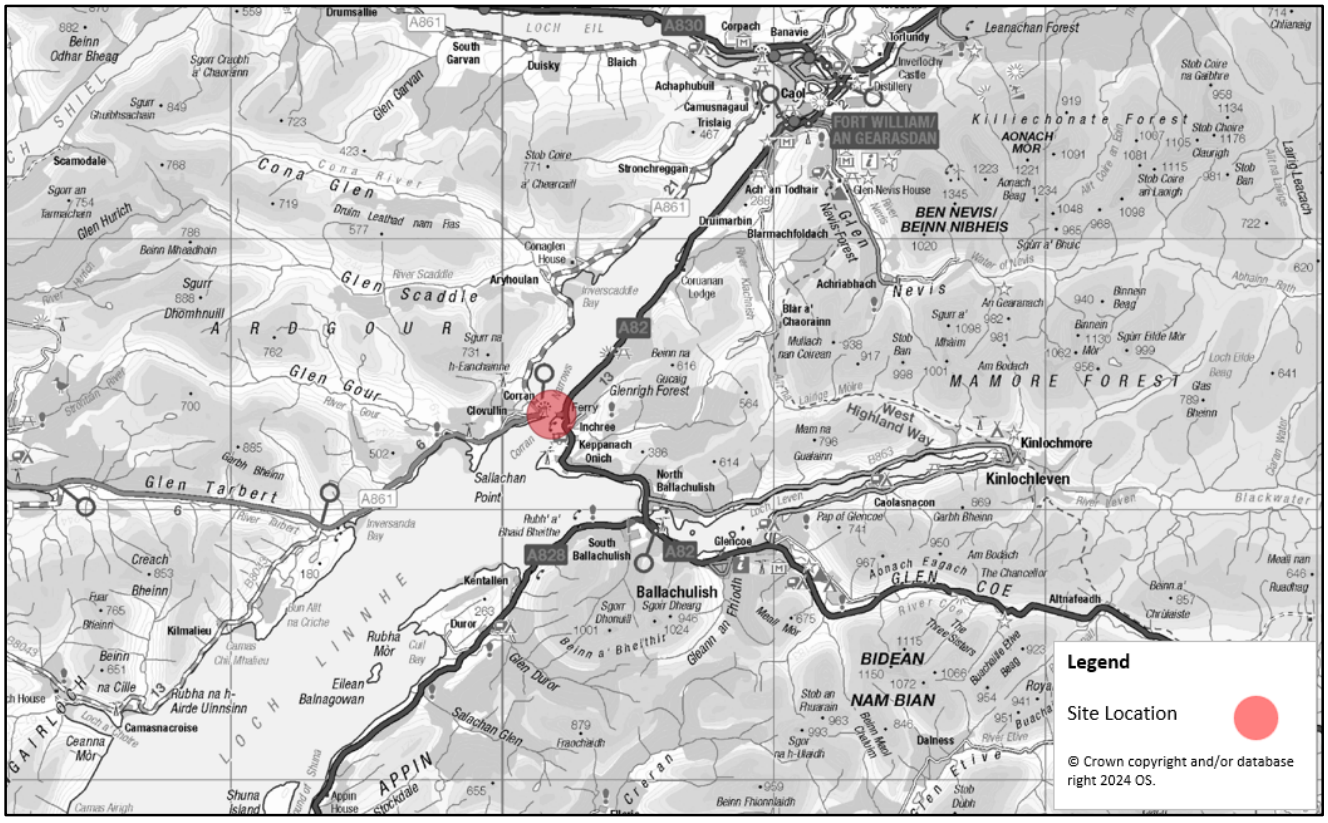
THC is proposing an upgrade to the Corran Ferry Service that will involve the replacement of the existing Ferry with one electric vessel.

The CFIIS involves the design and development of facilitative infrastructure to support the new electric vessel (NEV) for the Ferry service, including a new slipway at Ardgour and Nether Lochaber as well as marshalling areas and public facilities at the Nether Lochaber side of the Narrows. The CFIIS will also include the construction of a new berthing pier on the Ardgour side of the Narrows.

This TA has been prepared to review and explain the transport and access issues relating to the CFIIS. This report provides information on the transport planning aspects of the proposed development, providing supplementary information to assist on the determination of the planning and marine licence applications.

The location of the existing slipways at Ardgour and Nether Lochaber associated with the Corran Ferry Service, which facilitate the crossing of Corran Narrows, are shown in Figure 1.

Figure 1 Site Location



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The report identifies the key transport and access issues associated with the CFIIS for both the operational and construction phases of the proposed development.

1.2 Consultation

The following consultation was undertaken and has informed this TA:

- Pre-application advice was received from THC and Transport Scotland (TS) Officers in February 2023.
- Email correspondence was undertaken in December 2023 between PF and TS regarding appropriate surveys to measure speeds along the A82 in December 2024.
- A TA Scoping Report was submitted to THC and TS Officers in March 2024.
- The Applicant submitted a request for an Environmental Impact Assessment (EIA) Scoping Opinion in respect of the EIA Report, which included a section on traffic, transport and access. The TA Scoping Report has been appended to the EIA Scoping Report.

Further details of consultation undertaken with respect to the TA and the EIA assessment are provided in EIA Report Chapter 16: Traffic, Transport and Access.

1.3 Structure of the Report

Following this introduction, the report will examine the following subject areas:

- Site Description and Current Uses;
- Transport Policy Review;
- Current Access Arrangements;
- Proposed Site Layout and Operation, including Parking Provision;
- Proposed Access Strategy;
- Traffic Generation and Distribution;
- Traffic Impact Assessment, including Mitigation Measures; and
- Summary and Conclusions.

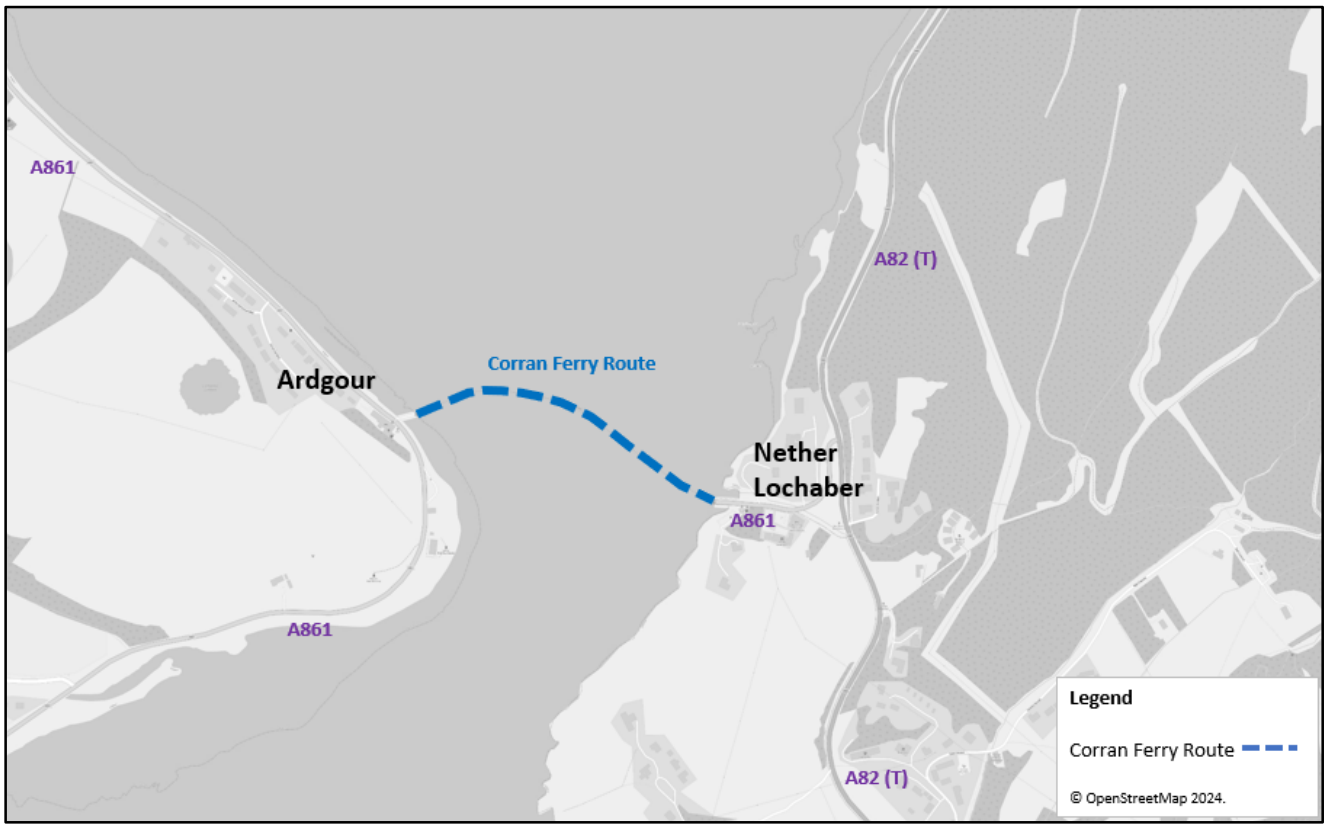
2 Site Description and Current Uses

2.1 Site Location

The CFIIS is located at Ardgour and Nether Lochaber slipways which facilitate the existing Corran Ferry crossing. The Corran Ferry is operated by THC and provides connections from the A82 trunk road to Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Movern and the Isle of Mull.

The existing Corran Ferry Route location across Corran Narrows is shown in Figure 2.

Figure 2 Corran Ferry Route



2.2 Current Land Uses

At the Nether Lochaber side of the Narrows, there are a number of existing facilities located within the building near the slipway, which include an Information Point where Ferry timetables, a bus stop and a seating area are located. Public toilet facilities are also located in this same building. There are approximately ten car parking spaces located at the Ferry car park as well as a bicycle shelter.

At the Ardgour side of the Narrows, public toilet facilities are available beside The Inn at Ardgour. There is an unmarked area to the north-west of the Ardgour slipway which appears to be used for unofficial car parking.

Designated marshalling areas are located at both Ardgour and Nether Lochaber entrances to the slipways to control the vehicles waiting to use the Ferry, with the aim of avoiding vehicles queueing on the public road network.

Corran Ferry provides a connection for foot passengers, cyclists, private and light goods vehicles (LGVs), Heavy Goods Vehicles (HGVs) and buses. Fares are dependent on the vehicle types; however, pedestrians and cyclists can travel free of charge. The Ferry usually provides a regular service from early in the morning until late at night, seven days a week and takes approximately five minutes to cross.

3 Transport Policy Review

3.1 Introduction

An overview of relevant transport planning policies has been undertaken and is summarised below for national and local government policies.

3.2 National Policy and Guidance

3.2.1 National Planning Framework 4 (2023)

The National Planning Framework (NPF) is a long-term plan for Scotland that sets out where development and infrastructure is needed in the country. NPF4 sets out the Government's plan looking forward to 2045 that will guide spatial development, set out national planning policies, designate national developments and highlight regional spatial priorities. It is part of the development plan, and so influences planning decisions across Scotland.

NPF4 puts the climate and nature crises at the heart of the Scottish planning system and was adopted in February 2023.

With regards to Regional Spatial Priorities, North and West Coast and Islands, the NPF4 notes that:

"Communities in this area will need resilient transport connectivity to maintain accessibility and lifeline links, and further innovation will be required to help modernise connections and decarbonise transport systems. A net zero islands air network and decarbonisation of Ferry services will help to secure the viability and service stability of island and remote coastal communities."

Within NPF4, Policy 13 Sustainable Transport notes:

"a) Proposals to improve, enhance or provide active travel infrastructure, public transport infrastructure or multi-modal hubs will be supported. This includes proposals:

i. for electric vehicle charging infrastructure and electric vehicle forecourts, especially where fuelled by renewable energy.
ii. which support a mode shift of freight from road to more sustainable modes, including last-mile delivery.
iii. that build in resilience to the effects of climate change and where appropriate incorporate blue and green infrastructure and nature rich habitats (such as natural planting or water systems).

b) Development proposals will be supported where it can be demonstrated that the transport requirements generated have been considered in line with the sustainable travel and investment hierarchies and where appropriate they:

i. Provide direct, easy, segregated and safe links to local facilities via walking, wheeling and cycling networks before occupation;
ii. Will be accessible by public transport, ideally supporting the use of existing services;
iii. Integrate transport modes;
iv. Provide low or zero-emission vehicle and cycle charging points in safe and convenient locations, in alignment with building standards;
v. Supply safe, secure and convenient cycle parking to meet the needs of users and which is more conveniently located than car parking;
vi. Are designed to incorporate safety measures including safe crossings for walking and wheeling and reducing the number and speed of vehicles;
vii. Have taken into account, at the earliest stage of design, the transport needs of diverse groups including users with protected characteristics to ensure the safety, ease and needs of all users; and
viii. Adequately mitigate any impact on local public access routes.

c) Where a development proposal will generate a significant increase in the number of person trips, a transport assessment will be required to be undertaken in accordance with the relevant guidance.

d) Development proposals for significant travel generating uses will not be supported in locations which would increase reliance on the private car, taking into account the specific characteristics of the area.

e) Development proposals which are ambitious in terms of low/no car parking will be supported, particularly in urban locations that are well-served by sustainable transport modes and where they do not create barriers to access by disabled people.

f) Development proposals for significant travel generating uses, or smaller-scale developments where it is important to monitor travel patterns resulting from the development, will only be supported if they are accompanied by a Travel Plan with supporting planning conditions/obligations. Travel plans should set out clear arrangements for delivering against targets, as well as monitoring and evaluation.

g) Development proposals that have the potential to affect the operation and safety of the Strategic Transport Network will be fully assessed to determine their impact. Where it has been demonstrated that existing infrastructure does not have the capacity to accommodate a development without adverse impacts on safety or unacceptable impacts on operational performance, the cost of the mitigation measures required to ensure the continued safe and effective operation of the network should be met by the developer. While new junctions on trunk roads are not normally acceptable, the case for a new junction will be considered by Transport Scotland where significant economic or regeneration benefits can be demonstrated. New junctions will only be considered if they are designed in accordance with relevant guidance and where there will be no adverse impact on road safety or operational performance."

3.2.2 Planning Advice Note (PAN 75)

PAN 75 states that: 'Development plan policy should encourage development of significant travel generating proposals at locations which are key nodes on the public transport network' and 'locations should encourage modal shift of people and freight by providing good linkages to rail, walking and cycling networks and with vehicular considerations, including parking, having a less significant role'.

Additionally, PAN 75 provides guidance on accessibility thresholds and walking distances as follows:

- The maximum acceptable walking distance to local facilities is 1600 metres.

3.2.3 Transport Assessment Guidance (2012)

Transport Scotland's (TS) Transport Assessment Guidance was published in 2012. It aims to assist in the preparation of Transport Assessments (TA) for development proposals in Scotland such that the likely transport impacts can be identified and dealt with as early as possible in the planning process. The document sets out requirements according to the scale of development being proposed.

Section 5.21 and 5.22 state that:

- Journey times of up to 20-30 mins are appropriate for walking and 30-40 mins for cycling;
- Public transport journey times can be calculated by a combination of analysis of timetables and maps. This should be complemented by observation of walking times to actual (or potential) bus stops. A 30-minute door to door travel time is an appropriate choice of time-band by public transport for most types of development although it may also be helpful to consider a 45-minute door to door travel time; and
- For developments of national or regional importance, 1 hour may be appropriate.

3.3 Local Policy and Guidance

3.3.1 West Highland and Islands Local Development Plan (WestPlan) (2019)

WestPlan outlines the following in relation to Vision and Strategy, Connectivity and Transport:

"Travelling to, from, and within the Plan area is challenging because of the physical constraints of mountains, lochs, an indented coastline, and for the islands, separation from the mainland. Communities are widely dispersed across this Plan area and their residents, businesses and visitors rely heavily on the transport network to provide, often lifeline, links to education, employment, shops and services. The proposal to focus the majority of development on existing settlements helps to reduce the need for additional transport improvements. However, there are a number of sections of the transport network where improvements are necessary to ease current pressures, support the delivery of future development and encourage more sustainable modes of travel."

Within WestPlan, Table 4 Transport Improvements outlines additional details on the *"potential transport improvements and the suggested approach to taking these forward…"*. These are outlined below in relation to the Corran Ferry Crossing.

Table 1 WestPlan Transport Improvements[1]

Transport Improvement	Council's Approach
A82 to A861 - Corran Narrows Crossing	*Need for enhanced crossing listed in the accompanying Action Programme, shown on the Spatial Strategy Map, transport appraisal of options to be undertaken including consideration of land to be safeguarded from development either side of the narrows to leave open future crossing options.*

3.3.2 Highland-wide Local Development Plan (2012)

The Highland-wide Local Development Plan (LDP) was adopted by THC in April 2012 and is the established planning policy for the Highlands. It sets out a settlement strategy and spatial framework for how the Council foresees development occurring in the forthcoming twenty-year period.

The LDP does not contain any specific policy guidance for the CFIIS. However, Policy 56 is relevant with regards to general transport policy. The relevant transport elements from this policy are:

"Development proposals that involve travel generation must include sufficient information with the application to enable the Council to consider any likely on- and off- site transport implications of the development and should:

- *be designed for the safety and convenience of all potential users;*
- *incorporate appropriate mitigation on site and/or off site, provided through developer contributions where necessary, which might include improvements and enhancements to the walking/cycling network and public transport services, road improvements and new roads; and*
- *incorporate an appropriate level of parking provision, having regard to the travel modes and services which will be available and key travel desire lines and to the maximum parking standards laid out in Scottish Planning Policy or those set by the Council.*

When development proposals are under consideration, the Council's Local Development Strategy will be treated as a material consideration."

[1] The Highland Council (2019), West Highland and Islands Local Development Plan (WestPlan) Available at: https://www.highland.gov.uk/info/178/development_plans/582/west_highland_and_islands_local_development_plan

3.3.3 Guidance on the Preparation of Transport Assessments (2014)

THC has prepared guidance on how Transport Assessments (TA) should be prepared for development sites within The Highlands. The guidance was published by THC in November 2014.

This TA has noted the guidelines and has provided the required assessment.

3.3.4 Roads and Transport Guidelines for New Developments (2013)

THC document outlines the guidance and standards for the provision of infrastructure within the council area which includes the design and construction of all new roads associated with development proposals.

The guidance document notes that a TA is required for all developments that will have significant transport impacts. The document notes that the TA should be:

"…comprehensive and consistent review of all of the potential transport impacts arising from a proposed development. The document should clearly set out the developers assumptions and how conclusions and recommendations have been reached. The TA should provide a balanced view of the proposed development, considering both positive and negative impacts."

4 Current Access Arrangements

4.1 Introduction

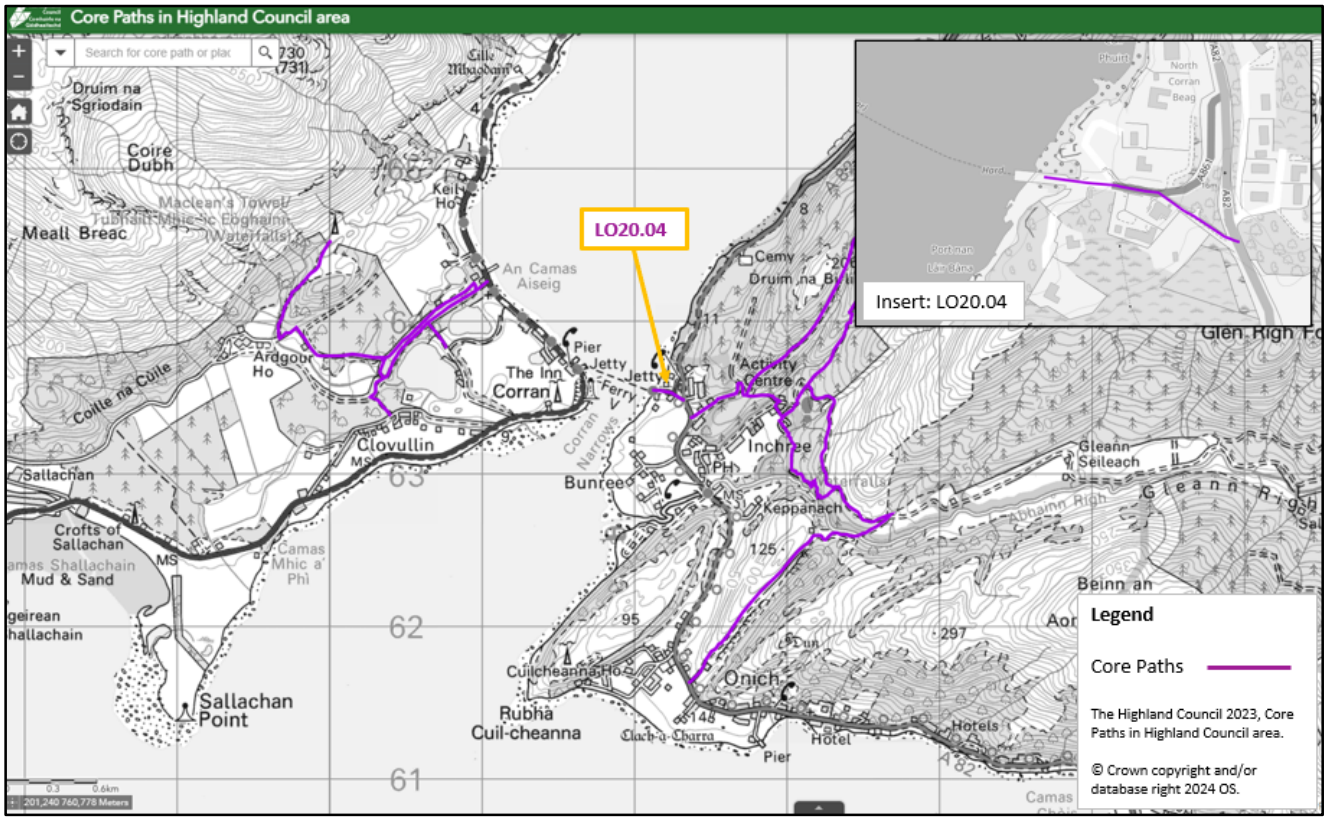
A review of the existing accessibility for all modes of transport in the vicinity of the proposed CFIIS has been reviewed in a hierarchical manner in accordance with good practice.

4.2 Pedestrian Access

A review of THC's Core Path plan has been undertaken and this indicated that there is one Core Path located in the immediate vicinity of the proposed CFIIS which is noted as Core Path LO20.04. Core Path LO20.04 is 0.23 kilometres (km) in length and links the A82 to the A861 via a traffic-free path, the Core Path continues towards the Nether Lochaber slipway along the A861.

The location of local Core Paths are shown in Figure 3 and are illustrated by purple lines. An insert of Core Path LO20.04 is also presented in Figure 3 and shows that the path follows the hilly terrain between the A82 (T) and A861.

Figure 3 Local Core Paths



There are a number of other Core Paths located within the wider area, which can be accessed directly from the A82 (T) and A861.

The accesses to Core Path LO20.04 from the A82 (T) and A861, are shown in Figure 4. The gradient of the Core Path at this location is approximately 1:6 to 1:7 over a distance of approximately 50 metres (m).

Figure 4 Access to Core Path LO20.04 from the A82 (T) and A861, respectively

© Google Maps

At the Nether Lochaber side of the Narrows, there are no footways / shared paths along the A82 (T) to the north of the A82 (T) / A861 priority junction, however, Core Path LO20.04 provides access to a shared path along the western boundary of the A82 (T), to the south, which continues to the access to Inchree, where there is continued shared path access along the eastern boundary of the A82 (T).

A shared path is located along the eastern side of the A82 (T), to the south, which is approximately 50 m in length and provides access to the bus stop which is serviced by southbound services.

At the Ardgour side of the Narrows, there are no dedicated footways / shared paths along the A861, however, there appears to be a short section of path approximately 35 m in length comprising on-road lining which leads to an unmarked parking area to the north of the slipway in Ardgour.

The level of pedestrian infrastructure is commensurate with the scale of the local settlements and their rural setting.

4.3 Cyclist Access

A review of the Sustrans cycle map indicates that National Cycle Network (NCN) Route 78 is located along the shared path at the A82 (T), to the south of the A82 (T) / A861 priority junction and continues across Corran Narrows and subsequently to the north of Ardgour, on-road along the A861. NCN Route 78 is shown in Figure 5 and comprises The Caledonian Way which is 378 km in length and runs from Campbeltown to Inverness.

Figure 5 National Cycle Network Route 78 (Sustrans)

4.4 Public Transport Access

Northbound and southbound bus stops are located along the A82 (T) and are within a 400 m walking distance of the existing Nether Lochaber slipway. It should however be noted that the existing route comprises hilly terrain, which is not suitable for individuals with mobility issues, novice cyclists or people pushing prams. Both the northbound and southbound bus stops comprise bus shelters with flagpole and timetable information and are shown in Figure 6 and Figure 7.

Figure 6 A82 (T) Corran Ferry Junction Bus Stop (Northbound Service)

© Google Maps

Figure 7 A82 (T) Corran Ferry Junction Bus Stop (Southbound Service)

© Google Maps

A bus stop is located at North Corran, approximately 250 m north-west of the Ardgour slipway, which serves the school bus service during the school term.

Bus timetable information for the bus stops closest to the proposed CFIIS are outlined in Table 2.

Table 2 Public Transport Provision

Route Number	Route Description	Operator	Frequency (In Each Direction)		
			Mon - Fri	Sat	Sun
Bus Stop Location: Slipway at Nether Lochaber, A861					
506	Kilchoan – Fort William	Shiel Buses	One Service	One Service	No Service
507	Lochaline – Fort William	Shiel Buses	One Service*	No Service	No Service
Bus Stop Location: Corran Ferry Junction, A82					
913 / 914 / 915 / 916	Glasgow – Fort Willian – Portree – Uig	Citylink	60 – 120 mins	60 – 120 mins	60 – 120 mins**
44 / 144	Kinlochleven – Fort William	Shiel Buses	Seven to Eight Daily Services	Seven Daily Services	Four Daily Services
512B	Kinlochleven Road End – Ballachulish – LHS – Bun Sgoil Lochaber	Shiel Buses	One Daily Service***	No Service	No Service
918	Oban – Fort William	Citylink	Two Daily Services	Two Daily Services	No Service
Bus Stop Location: North Corran, A861					
528	Treslaig to Ardnamurchan High School	Shiel Buses	One Service Daily****	No Service	No Service

* Thursdays Only
** Daily 22 April - 7 September 2024, otherwise Mondays to Saturdays only
*** Two Services on Friday, School Days Only
**** School Days Only

Copies of the above timetable information are presented in Annex A.

4.5 Ferry Operations

Corran Ferry service operates 361 days of the year and provides a connection across Corran Narrows between the settlements at Corran and Ardgour.

The timetabled service, which changes seasonally, includes scheduled crossings every 20 to 30 minutes, from early morning to late at night. However, during busy periods, the service will effectively run a shuttle service, making more frequent crossings to relieve traffic congestion in the marshalling areas. The crossing takes approximately 5 minutes.

Corran Ferry service currently operates with one of two vessels which include the MV Corran and the MV Maid of Glencoul. The MV Corran, as shown in Figure 8, operates for the majority of the year with the standby MV Maid of Glencoul introduced when the MV Corran is away for maintenance or repairs. The MV Corran has a capacity of 28 Passenger Carrier Units (PCUs) while the MV Maid of Glencoul has a smaller vehicle capacity of 14 PCUs as well as more onerous height and weight restrictions which limits access for some larger vehicles. Along with motor vehicles, foot passengers and cyclists can also use the Corran Ferry service.

Figure 8 MV Corran, at Corran (Nether Lochaber) Slipway

© *Google Maps*

During periods when the Corran Ferry is not operating, there is still a road route connection between the settlements of Ardgour and Corran via Fort William. However, this road route is approximately 65 km and includes a bridge with a 3.6 m height restriction at Loch Eil.

A copy of the Ferry timetable is presented in Annex B.

4.6 Road Access

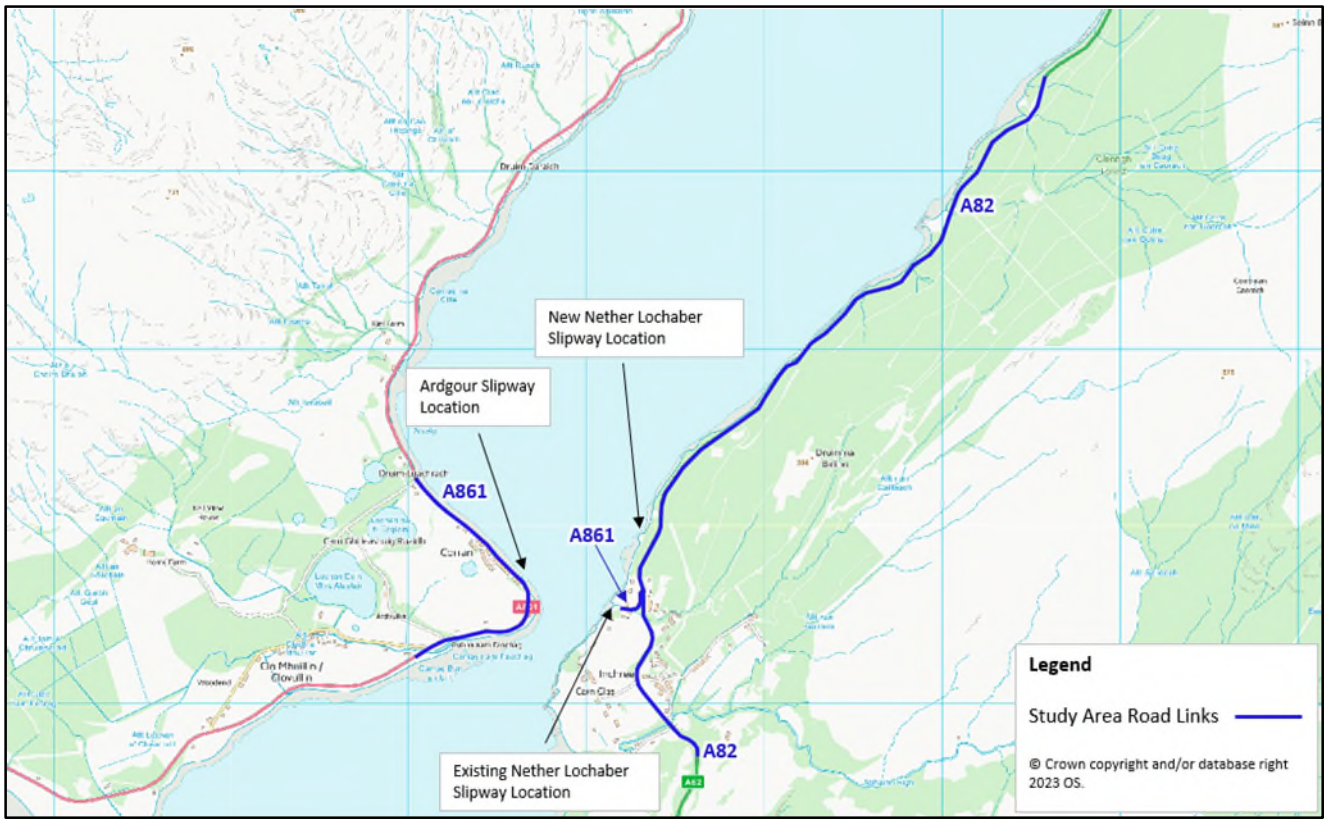
4.6.1 Study Area

It is proposed that the study area for the TA will comprise the following road links:

- A82 (T), between Keppanach and Corrychurrachan;
- A861, between A82 (T) and Nether Lochaber slipway; and
- A861, between Clovullin and Ardgour Parish Church.

The extent of the study area is shown in Figure 9.

Figure 9 Study Area Road Links



4.6.2 Existing Road Network

From the Nether Lochaber side of the Narrows, existing access to the slipway is taken from the A861 via a priority junction with the A82 (T) and from the Ardgour side of the Narrows, the Ardgour slipway is accessed directly from the A861. Access to the field area where temporary power infrastructure will be provided via North Corran, provision for turning will be provided in the field area.

The A82 (T) forms part of the trunk road network and comprises a two-way single carriageway within the study area and provides connections from Glasgow to Inverness via Fort William and is mainly subject to a 50 miles per hour (mph) speed limit, which reduces when travelling through towns and villages. The A82 (T) appears to be in generally good condition and is managed by BEAR Scotland, on behalf of TS.

On the Nether Lochaber side of the Narrows, the A861 comprises a two-way single carriageway road. Marshalling lanes are located adjacent to the south-westbound lane to manage vehicles queueing for the Ferry. This section of the A861 is subject to the national speed limit.

On the Ardgour side of the Narrows, the A861 comprises a two-way single carriageway road to the south of Ardgour slipway and comprises a single track carriageway with passing places to the north of the slipway.

North Corran comprises a cul-de-sac to a residential area where on-street parking is available. Within the settlement of Ardgour, the A861 and North Corran are subject to a speed limit of 20 mph[2]. The speed limit along the A861 increases to the national speed limit when leaving Ardgour. The A861 appears to be mainly in good condition and is maintained by THC.

4.6.3 General Road Suitability

A number of the roads within the study area form part of the agreed route network used for the extraction of timber and are therefore regularly used by heavy goods vehicle (HGV) traffic. This includes the A82 (T), which is an 'Agreed Route' and the A861, which is a 'Consultation Route'.

The Agreed Timber Route Map has been developed by The Timber Transport Forum who are a partnership of the forestry and timber industries, local government, national government agencies, timber hauliers and road and freight associations. One of the key aims of the forum is to minimise the impact of timber transport on the public road network, on local communities and the environment and a way of achieving this is to categorise the roads leading to forest areas in terms of their capacity to sustain the likely level of timber haulage vehicles i.e., HGVs. The routes are categorised into four groups, namely; 'Agreed Routes', 'Consultation Routes', 'Severely Restricted Routes' and 'Excluded Routes'.

'Agreed Routes' are categorised as routes used for timber haulage without restriction as regulated by the Road Traffic Act 1988. A-roads are classified as 'Agreed Routes' by default unless covered by one of the other road classifications. Those links classed as 'Consultation Routes' are categorised as a route which is key to timber extraction, but which are not up to 'Agreed Route' standard. Consultation with the local authority is required, and it may be necessary to agree limits of timing, allowable tonnage etc. before the route can be used. B-roads are classified as 'Consultation Routes' by default unless covered by one of the other classifications. 'Severely Restricted Routes' are not normally to be used for timber transport in their present condition. These routes are close to being Excluded Routes. Consultation with the local authority is required prior to use. Finally, 'Excluded Routes' should not be used for timber transport in their present condition. These routes are either formally restricted, or are close to being formally restricted, to protect the network from damaging loads.

4.6.4 Marshalling Areas

Nether Lochaber Marshalling Area

At the Nether Lochaber side of the Narrows, cars use the A861 for marshalling, with the queue starting adjacent to the existing toilet block near the entrance to the slipway. Additional marshalling space in the form of three marshalling lanes is provided near the junction with the A82 (T) as shown in Figure 10.

[2] This was recently updated from a 30 mph zone to a 20 mph zone in 2024.

Figure 10 Nether Lochaber Marshalling Area

© Google Maps

A total of 172 m is provided for Ferry vehicle queueing at this location which includes three formal marshalling lanes and pre-lane space. Traffic queueing in excess of the formal marshalling area has a further 20 m of A861 carriageway before directly impacting the A82 (T). Queueing traffic is known to occasionally back up onto the A82 (T), for instance during peak periods, such as during the Summer or bank holiday weekends.

Ardgour Marshalling Area

On the Ardgour side of the Narrows, there are three marshalling lanes that are accessed directly from the A861, which are shown in Figure 11.

Figure 11 Ardgour Marshalling Area

© *Google Maps*

The formal marshalling area comprises approximately 170 m of available space in total. There is also an area which is 'boxed out' adjacent to the A861, approximately 120 metres squared (m²), which is generally used for larger vehicles queueing for the Ferry. In instances where waiting traffic queues are in excess of the formal marshalling area, the A861 is directly impacted.

4.7 Existing Traffic Conditions

Traffic surveys in the form of junction turning counts and Automatic Traffic Surveys (ATCs) were undertaken to establish baseline traffic conditions on the local and trunk road network within the study area. It was agreed with TS and THC that the surveys would be undertaken during the Easter holidays, as holiday movements traditionally capture tourist traffic in the area, which would allow for a robust assessment.

4.7.1 Turning Count Surveys

Junction turning count surveys were undertaken on Friday 05 April and Saturday 06 April 2024 between the hours of 05:30 and 22:30. The turning count surveys were undertaken at the following junctions:

1. A82 (T) / A861 priority junction;
2. A861 / Ardgour Ferry Terminal access to marshalling area; and
3. A861 / Ardgour Ferry Terminal slipway junction.

4.7.2 Automatic Traffic Counts

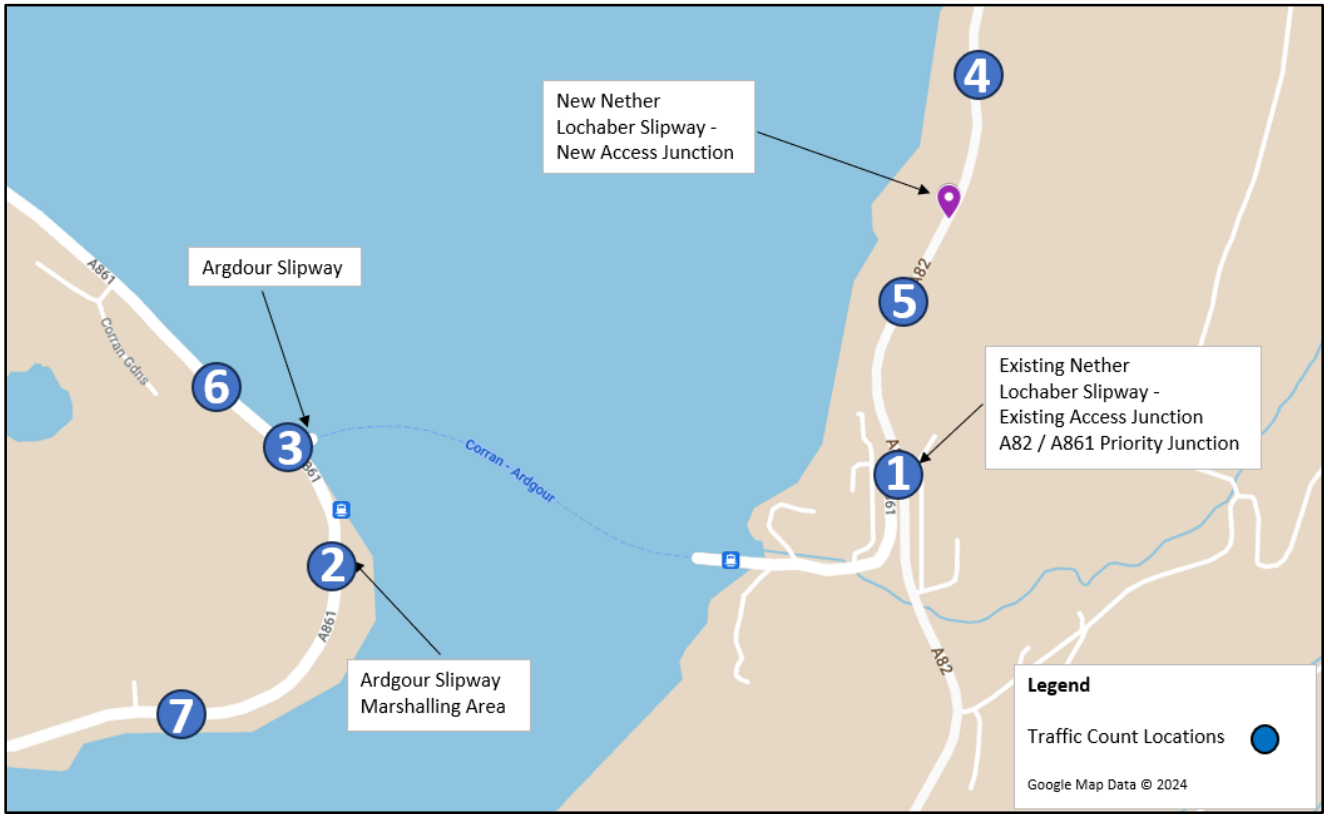
ATC surveys were undertaken over a 7-day period between Friday 05 April and Thursday 11 April to obtain traffic volume data and speed data. The ATCs were undertaken at the following locations:

4. A82 (T) north of proposed new access junction to the improved Nether Lochaber Slipway;
5. A82 (T) south of proposed new access junction to the improved Nether Lochaber Slipway;
6. A861 north of Ardgour Slipway; and
7. A861 south of Ardgour Slipway.

The ATC sites were identified as being areas where sensitive receptors on the access route would be located. A full receptor sensitivity and effect review is prepared in Chapter 16: Traffic, Transport and Access of the EIA Report.

The locations of the traffic surveys (showing the numbered locations described in the preceding sections) are shown in Figure 12 and described in the following sections.

Figure 12 Traffic Count Locations

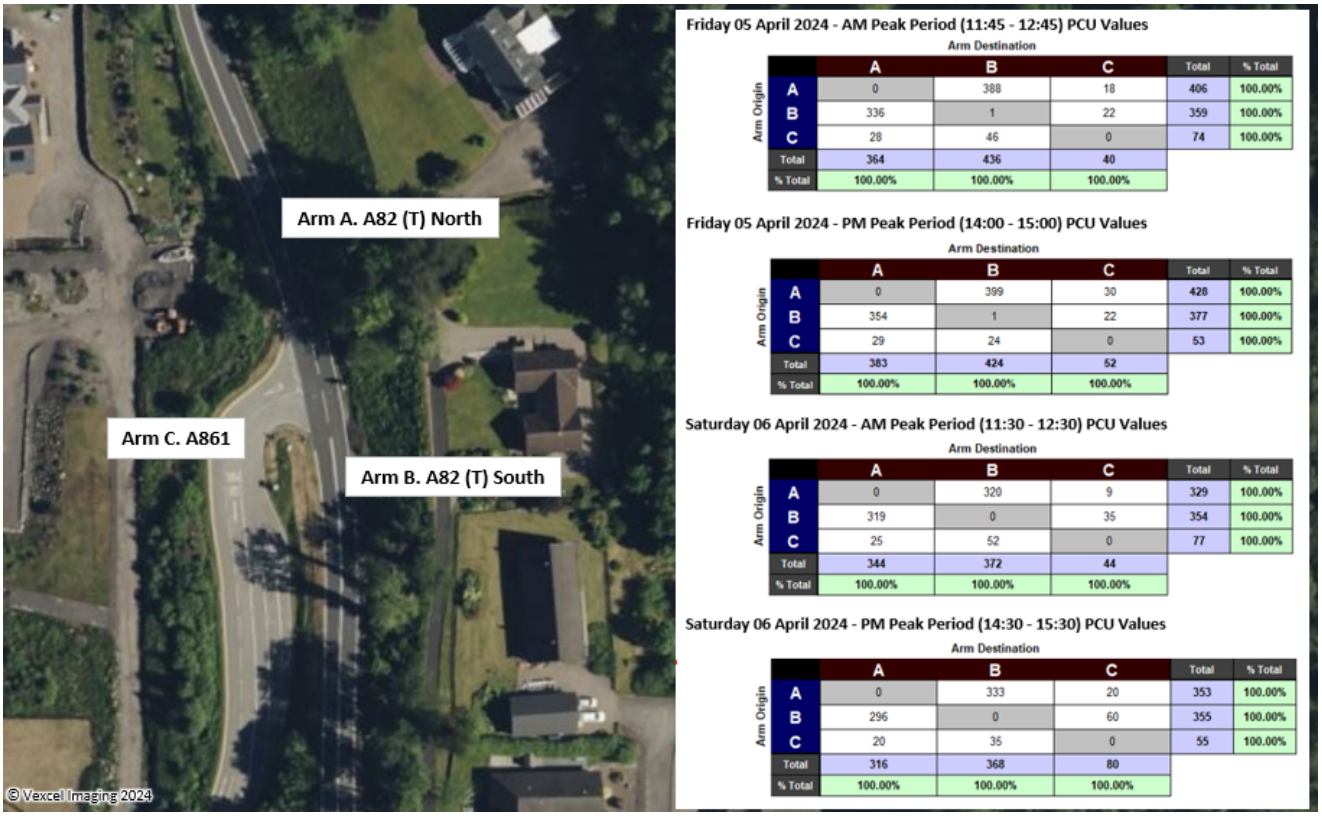


4.7.3 Existing Traffic Flow Information

Junction 1: A82 / A861 priority junction

Figure 13 outlines the peak AM and PM traffic flows observed at Junction 1: A82 (T) / A861 priority junction during the junction turning count survey. The traffic flows are presented in Passenger Car Units (PCUs)[3].

Figure 13 Junction 1 Friday and Saturday Baseline AM and PM Peaks



At the Nether Lochaber side of the Narrows, the short section of A861 provides access to local dwellings and tourist accommodation within the settlement of Corran as well as Nether Lochaber slipway. The information provided in Figure 13 shows that:

- During the surveyed Friday AM Peak hour a total of:
  - 40 PCUs accessed the A861 and 74 PCUs exited from the A861 onto the A82 (T); and
  - 388 PCUs and 336 PCUs travelled on the A82 (T) past the junction southbound and northbound respectively.
- During the surveyed Friday PM Peak hour a total of:
  - 52 PCUs accessed the A861 and 53 PCUs exited from the A861 onto the A82 (T); and
  - 399 PCUs and 354 PCUs travelled on the A82 (T) past the junction southbound and northbound respectively.
- During the surveyed Saturday AM Peak hour a total of:
  - 44 PCUs accessed the A861 and 77 PCUs exited from the A861 onto the A82 (T); and
  - 320 PCUs and 319 PCUs travelled on the A82 (T) past the junction southbound and northbound respectively.
- During the surveyed Saturday PM Peak hour a total of:
  - 80 PCUs accessed the A861 and 55 PCUs exited from the A861 onto the A82 (T); and

[3] PCU Values from surveys: Car = 1.0 PCU, LGV = 1.0 PCU, Other Goods Vehicle (OGV)1 = 1.5 PCU, OGV2 = 2.3 PCU, Bus = 2.0 PCU, P/Cycle = 0.2 PCU and M/Cycle = 0.4 PCU. Note: OGV1 are defined as all larger rigid vehicles with two or three axles and OGV2 are defines as all rigid vehicles with four or more axles and all articulated vehicles.

- 333 PCUs and 296 PCUs travelled on the A82 (T) past the junction southbound and northbound respectively.

Junction 2: A861 / Ardgour Ferry Terminal access to marshalling area

Figure 14 outlines the peak AM and PM traffic flows observed at Junction 2: A861 / Ardgour Ferry Terminal access to marshalling during the junction turning count survey.

Figure 14 Junction 2 Friday and Saturday Baseline AM and PM Peaks

Friday 05 April 2024 - AM Peak Period (11:30 - 12:30) PCU Values

Arm Destination

Arm Origin	A	B	C	Total	% Total
A	1	5	33	39	100.00%
B	0	0	0	0	0.00%
C	11	51	0	61	100.00%
Total	12	56	33		
% Total	100.00%	100.00%	100.00%		

Friday 05 April 2024 - PM Peak Period (15:45 - 16:45) PCU Values

Arm Destination

Arm Origin	A	B	C	Total	% Total
A	0	5	52	57	100.00%
B	0	0	0	0	0.00%
C	17	47	0	64	100.00%
Total	17	52	52		
% Total	100.00%	100.00%	100.00%		

Saturday 06 April 2024 - AM Peak Period (10:00 - 11:00) PCU Values

Arm Destination

Arm Origin	A	B	C	Total	% Total
A	0	4	50	54	100.00%
B	0	0	0	0	0.00%
C	15	53	0	68	100.00%
Total	15	57	50		
% Total	100.00%	100.00%	100.00%		

Saturday 06 April 2024 - PM Peak Period (12:00 - 13:00) PCU Values

Arm Destination

Arm Origin	A	B	C	Total	% Total
A	0	5	53	58	100.00%
B	0	0	0	0	0.00%
C	31.2	31	0	62.2	100.00%
Total	31	36	53		
% Total	100.00%	100.00%	100.00%		

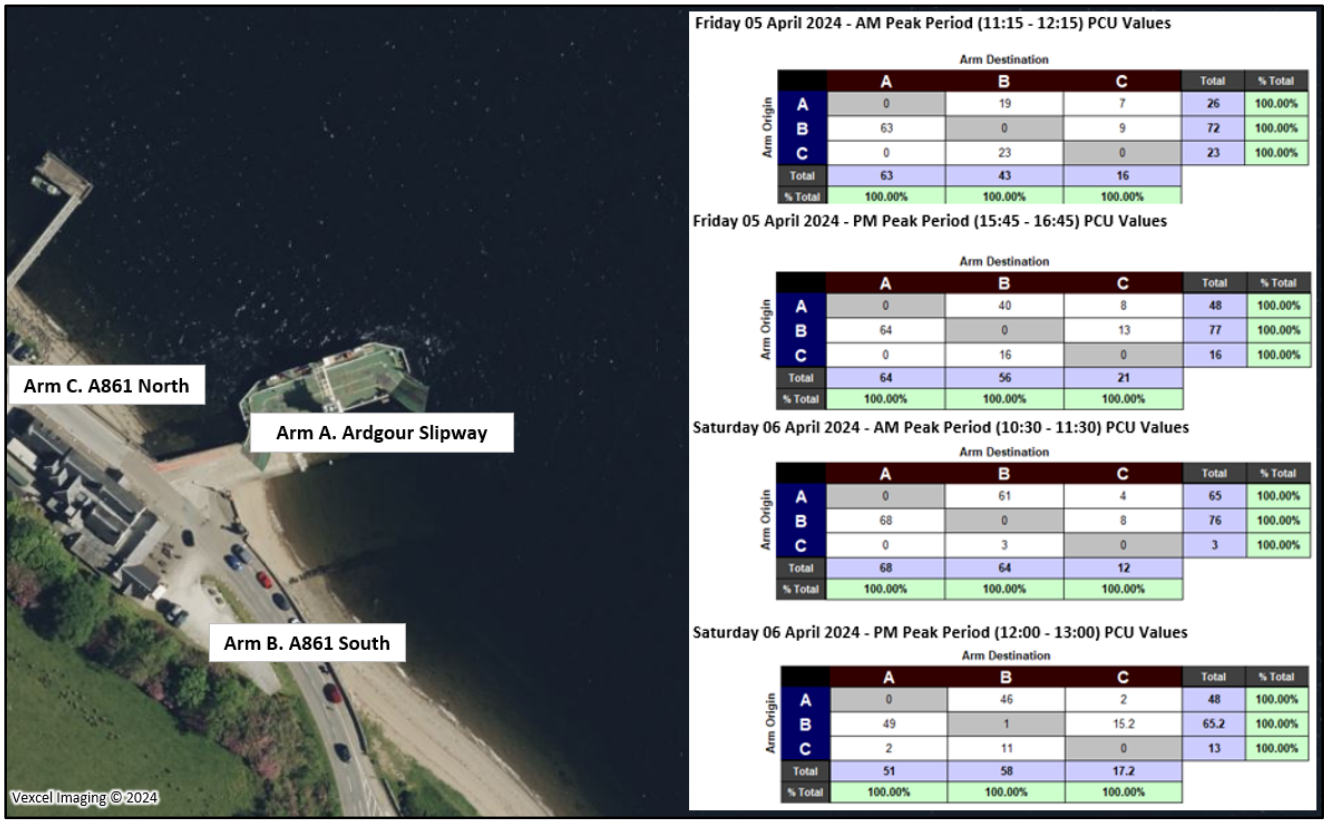
At the Ardgour side of the Narrows, the marshalling area provides an area for vehicles to wait to access Corran Ferry service. The information provided in Figure 14 shows that:

- During the surveyed Friday AM Peak hour a total of 56 PCUs accessed the marshalling area.
- During the surveyed Friday PM Peak hour a total of 52 PCUs accessed the marshalling area.
- During the surveyed Saturday AM Peak hour a total of 57 PCUs accessed the marshalling area.
- During the surveyed Saturday PM Peak hour a total of 36 PCUs accessed the marshalling area.

Junction 3: A861 / Ardgour Ferry Terminal slipway junction

Figure 15 outlines the peak AM and PM traffic flows observed at Junction 3: A861 / Ardgour Ferry Terminal slipway junction during the junction turning count survey.

Figure 15 Junction 3 Friday and Saturday Baseline AM and PM Peaks



Friday 05 April 2024 - AM Peak Period (11:15 - 12:15) PCU Values

Arm Origin \ Arm Destination	A	B	C	Total	% Total
A	0	19	7	26	100.00%
B	63	0	9	72	100.00%
C	0	23	0	23	100.00%
Total	63	43	16		
% Total	100.00%	100.00%	100.00%		

Friday 05 April 2024 - PM Peak Period (15:45 - 16:45) PCU Values

Arm Origin \ Arm Destination	A	B	C	Total	% Total
A	0	40	8	48	100.00%
B	64	0	13	77	100.00%
C	0	16	0	16	100.00%
Total	64	56	21		
% Total	100.00%	100.00%	100.00%		

Saturday 06 April 2024 - AM Peak Period (10:30 - 11:30) PCU Values

Arm Origin \ Arm Destination	A	B	C	Total	% Total
A	0	61	4	65	100.00%
B	68	0	8	76	100.00%
C	0	3	0	3	100.00%
Total	68	64	12		
% Total	100.00%	100.00%	100.00%		

Saturday 06 April 2024 - PM Peak Period (12:00 - 13:00) PCU Values

Arm Origin \ Arm Destination	A	B	C	Total	% Total
A	0	46	2	48	100.00%
B	49	1	15.2	65.2	100.00%
C	2	11	0	13	100.00%
Total	51	58	17.2		
% Total	100.00%	100.00%	100.00%		

A priority junction is located at the entrance to the Ardgour slipway which provides an access for vehicles getting on or off the Corran Ferry service. The information provided in Figure 15 shows that:

- During the surveyed Friday AM Peak hour a total of:
  - 26 PCUs exited from the slipway onto the A861 and 63 PCUs accessed the slipway; and
  - 23 PCUs and 9 PCUs travelled past the slipway on the A861 southbound and northbound respectively.
- During the surveyed Friday PM Peak hour a total of:
  - 48 PCUs exited from the slipway onto the A861 and 64 PCUs accessed the slipway; and
  - 16 PCUs and 13 PCUs travelled past the slipway on the A861 southbound and northbound respectively.
- During the surveyed Saturday AM Peak hour a total of:
  - 65 PCUs exited from the slipway onto the A861 and 68 PCUs accessed the slipway; and
  - 3 PCUs and 8 PCUs travelled past the slipway on the A861 southbound and northbound respectively.
- During the surveyed Saturday PM Peak hour a total of:
  - 48 PCUs exited from the slipway onto the A861 and 51 PCUs accessed the slipway; and
  - 11 PCUs and 15 PCUs travelled past the slipway on the A861 southbound and northbound respectively.

Please note that the flows above for Junctions 2 and 3 have been based on the individual junction turning count peaks rather than the network peak to allow for a suitably robust assessment.

Automatic Traffic Count Locations 4 to 7

As noted earlier, the ATC surveys were established along the A82 (T) and A861 in April 2024, which aligned with the Easter holidays. Ferry crossings were suspended on Sunday 07 April 2024 due to adverse weather conditions, and as such it can be reasonably assumed that this would have led to a slight increase in traffic volumes along the A82 (T) as vehicles wishing to travel via the settlement of Ardgour would have had to travel the on-road route through Fort William. Both the 7-day Average Daily Traffic (ADT) and 5-day Average Weekday Traffic (AWT) flows are presented in Table 3, which shows that broadly the AWT flows are higher than the ADT flows, which is generally expected. As such, the ADT flows are considered to be acceptable to be used in the assessment.

The traffic counters allowed the traffic flows to be split into vehicle classes and the data have been summarised into cars/ light goods vehicles (LGVs) and HGVs (all goods vehicles >3.5 tonnes gross maximum weight including buses).

Table 3 24-hour Two-way Average Traffic Data (2024)

Ref. No.	Survey Location	ADT / AWT	Cars & LGVs	HGV	Total	%HGV
4	A82 (T) north of proposed new access junction to the improved Nether Lochaber Slipway	**ADT**	**4,547**	**1,750**	**6,298**	**28%**
		AWT	4,627	1,995	6,621	30%
5	A82 (T) south of proposed new access junction to the improved Nether Lochaber Slipway	**ADT**	**4,616**	**1,697**	**6,314**	**27%**
		AWT	4,710	1,935	6,645	29%
6	A861 north of Ardgour Slipway	**ADT**	**213**	**85**	**299**	**29%**
		AWT	203	95	298	32%
7	A861 south of Ardgour Slipway	**ADT**	**628**	**257**	**885**	**29%**
		AWT	634	309	942	33%

Please note minor variances due to rounding may occur.

The ATC sites used to provide traffic volume data were also used to collect speed statistics. The two-way 5-day and 7-day average and 85th percentile speeds observed at the count locations are summarised in Table 4.

Table 4 Speed Summary (2024)

Ref. No.	Survey Location	7-day Mean / 5-day Mean	Mean Speed (mph)	85th %ile Speed (mph)	Speed Limit (mph)
4	A82 (T) north of proposed new access junction to the improved Nether Lochaber Slipway	**7-day Mean**	**42.2**	**46.6**	50
		5-day Mean	42.2	46.6	
5	A82 (T) south of proposed new access junction to the improved Nether Lochaber Slipway	**7-day Mean**	**43.0**	**47.7**	50
		5-day Mean	43.0	47.7	
6	A861 north of Ardgour Slipway	**7-day Mean**	**22.1**	**27.3**	20 / 30*
		5-day Mean	21.9	27.0	
7	A861 south of Ardgour Slipway	**7-day Mean**	**34.7**	**41.6**	60**
		5-day Mean	35.1	41.9	

**During the ATC survey period, the speed limit at this location was within a 30 mph zone. Since the ATC survey, THC has converted the 30 mph zone in Ardgour to a 20 mph zone.*
*** Survey location was 30 m from the 30 mph sign which was posted at the time of the ATC survey. As noted, THC has converted the 30 mph zone in Ardgour to a 20 mph zone since the ATC survey.*

Speed information from the A861 and A82 (T) suggests that there are no apparent speeding issues at the survey locations.

4.8 Accident Data

TA Guidance requires an analysis of the Personal Injury Accident (PIA) on the road network in the vicinity of any development to be undertaken for at least the most recent three-year period, or preferably a five-year period.

4.8.1 Local Road Network

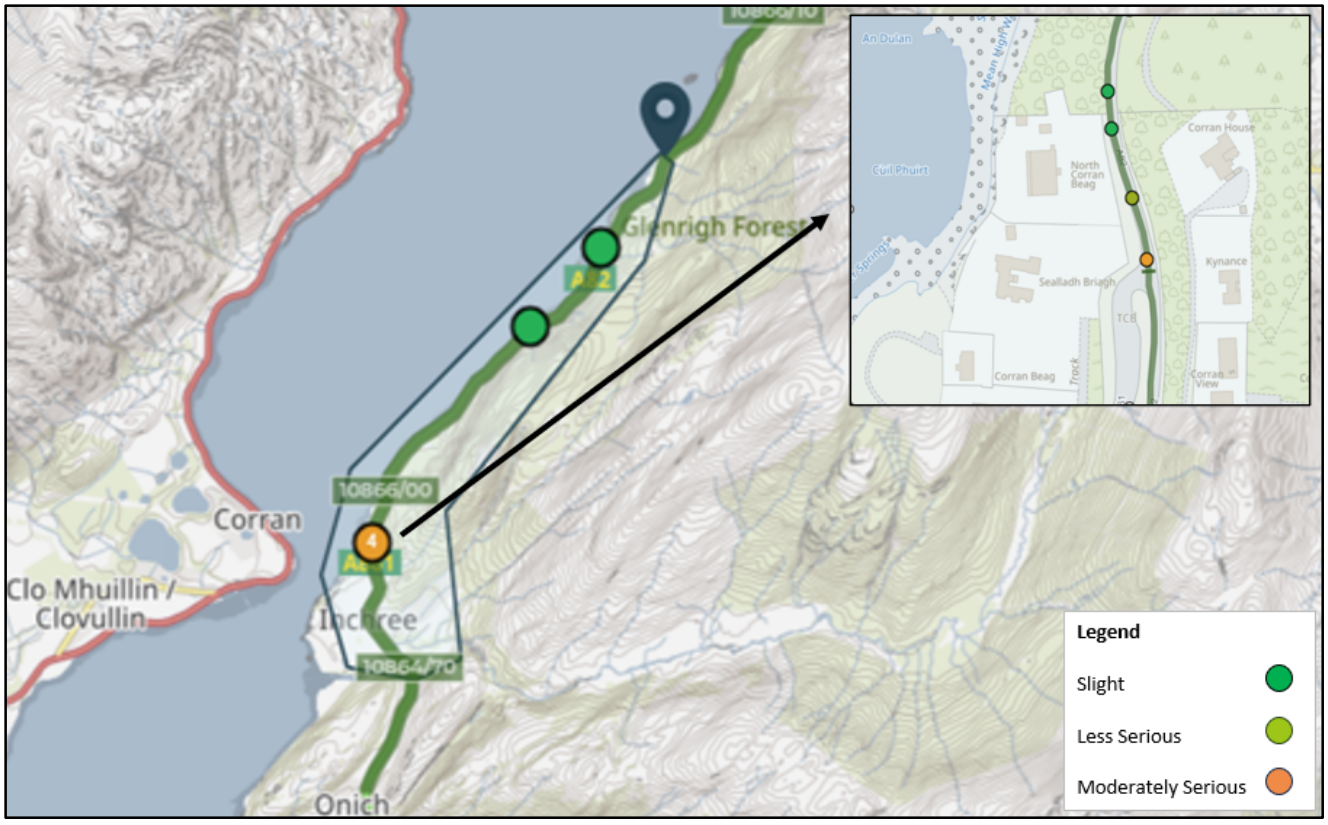
PIA data for the most recent five-year period, which covers 2018 to 2022, was obtained from the online resource CrashMap. CrashMap uses data collected by the police about road traffic crashes occurring on British roads, where someone is injured.

The statistics are categorised into three categories, namely “Slight” for damage only incidents, “Serious” for injury accidents and “Fatal” for accidents that result in a death. The review included the A861 within the study area and the review showed that there were no PIAs recorded along the A861 within the 5-year assessment period.

4.8.2 Trunk Road Network

PIA data for the A82 (T) within the study area for the time period between 01 January 2019 and 31 December 2023 was requested and subsequently provided by the Road Safety Team at TS. The statistics are categorised as “Slight”, “Less Serious”, “Moderately Serious”, “Very Serious”, “Serious” and “Fatal”. The locations of the PIAs within the A82 (T) of the study area are shown in Figure 16.

Figure 16 Personal Injury Accident Locations



Provided by Transport Scotland

The review found that:

- A total of six PIAs were recorded, of which four were classified as “Slight”, one as “Less Serious” and one as “Moderately Serious”;
- A total of four of the PIAs were recorded in close proximity, within 100 m of each other, between the A82 (T) / A861 priority junction and the A82 (T), north of the priority junction, of which two were classified as “Slight”, one as “Less Serious” and one as “Moderately Serious”;
    - The PIA classified as “Less Serious” was recorded a single vehicle incident and involved a motorcycle;
    - The PIA classified as “Moderately Serious” was recorded as a multi vehicle collision involving motorcycles;
    - The two PIAs classified as “Slight” both involved a collision between two vehicles and were recorded to have occurred during wet / damp conditions;
        - A collision which was recorded involved a van overtaking a cyclist and was classified as “Slight”; and
        - A single vehicle incident recorded on a bend during damp / wet weather was classified as “Slight”.

4.9 Local Facilities

As is typical for rural locations, there are few facilities in the immediate vicinity of the proposed CFIIS. There are a number of accommodation facilities in the area on both side of Corran Narrows. On the Nether Lochaber side of the Narrows, there is a lodge located within a short drive of the proposed CFIIS, which also comprises a bar and restaurant.

On the Ardgour side of the Narrows, there is an Inn which also comprises a bar and a restaurant directly across the road from the slipway, as well as a mobile pop-up café. There is also a primary school, a church and a brewery within a short drive of the slipway.

Additional amenities are located further away in Fort William, to the north of Corran, and Ballachulish to the south.

4.10 Future Baseline Traffic Conditions

4.10.1 2025 Construction Phase Traffic Flows

Construction of the proposed CFIIS could commence during 2025 if consent is granted and is anticipated to take approximately 16 months, depending on weather conditions and ecological considerations. Completion of all construction works is anticipated by early 2027.

To assess the likely effects during the construction period, base year traffic flows were determined by applying a National Road Traffic Forecast (NRTF) growth factors to the surveyed traffic flows. The NRTF high growth factor for 2024 to 2025 is 1.012 which is applied to the A82 (T) traffic flows and the NRTF low growth factor for 2024 to 2025 is 1.005 which is applied to the A861. These growth factors have been applied to the data to estimate the 2025 Base traffic flows, as shown in Table 5. This will be used in the Construction Peak Traffic Impact Assessment.

Table 5 24-hour Two-way Average Daily Traffic Data (2025)

Ref. No.	Survey Location	Cars & LGVs	HGV	Total	%HGV
4	A82 (T) north of proposed new access junction to the improved Nether Lochaber Slipway	4,602	1,771	6,374	28%
5	A82 (T) south of proposed new access junction to the improved Nether Lochaber Slipway	4,671	1,717	6,390	27%

Ref. No.	Survey Location	Cars & LGVs	HGV	Total	%HGV
6	A861 north of Ardgour Slipway	214	85	300	28%
7	A861 south of Ardgour Slipway	631	258	889	29%

Please note that variances may occur due to rounding.

4.10.2 2027 Operational Phase Traffic Flows

It is anticipated that the proposed CFIIS will be in operation in 2027 and 2028, respectively. For the purpose of the assessment, it is assumed that the opening year is 2027.

To assess the likely effects during the operational phase, base year traffic flows were determined by applying NRTF high growth factor for 2024 to 2027 is 1.040 which is applied to the A82 (T) traffic flows and the NRTF low growth factor for 2024 to 2027 is 1.016 which is applied to the A861. These growth factors have been applied to the data to estimate the 2027 Base traffic flows, as shown in Table 6.

The flows presented in Table 6 will be used in the Operational Peak Traffic Impact Assessment.

Table 6 24-hour Two-way Average Daily Traffic Data (2027)

Ref. No.	Survey Location	Cars & LGVs	HGV	Total	%HGV
4	A82 (T) north of proposed new access junction to the improved Nether Lochaber Slipway	4,727	1,819	6,547	28%
5	A82 (T) south of proposed new access junction to the improved Nether Lochaber Slipway	4,799	1,764	6,564	27%
6	A861 north of Ardgour Slipway	216	86	304	29%
7	A861 south of Ardgour Slipway	638	261	899	29%

Please note that variances may occur due to rounding.

4.10.3 2046 Operational Phase Traffic Flows

A sensitivity test to assess the impact of the increase in operational flows for the assessment year of 2046 is presented further in this report.

To assess the likely effects of operational flows in 2046, base year traffic flows were determined by applying NRTF high growth factor for 2027 to 2046, which is 1.246. This has been applied to the A82 (T) traffic flows and the NRTF low growth factor for 2027 to 2046, which is 1.067 has been applied to A861 traffic flows. These growth factors have been applied to the data to estimate the 2046 Base traffic flows, as shown in Table 7.

The flows presented in Table 7 will be used in the Operational Peak Traffic Impact Assessment – Sensitivity Assessment.

Table 7 24-hour Two-way Average Daily Traffic Data (2046)

Ref. No.	Survey Location	Cars & LGVs	HGV	Total	%HGV
4	A82 (T) north of proposed new access junction to the improved Nether Lochaber Slipway	5,890	2,267	8,159	28%
5	A82 (T) south of proposed new access junction to the improved Nether Lochaber Slipway	5,980	2,198	8,179	27%

Ref. No.	Survey Location	Cars & LGVs	HGV	Total	%HGV
6	A861 north of Ardgour Slipway	231	92	324	28%
7	A861 south of Ardgour Slipway	681	279	960	29%

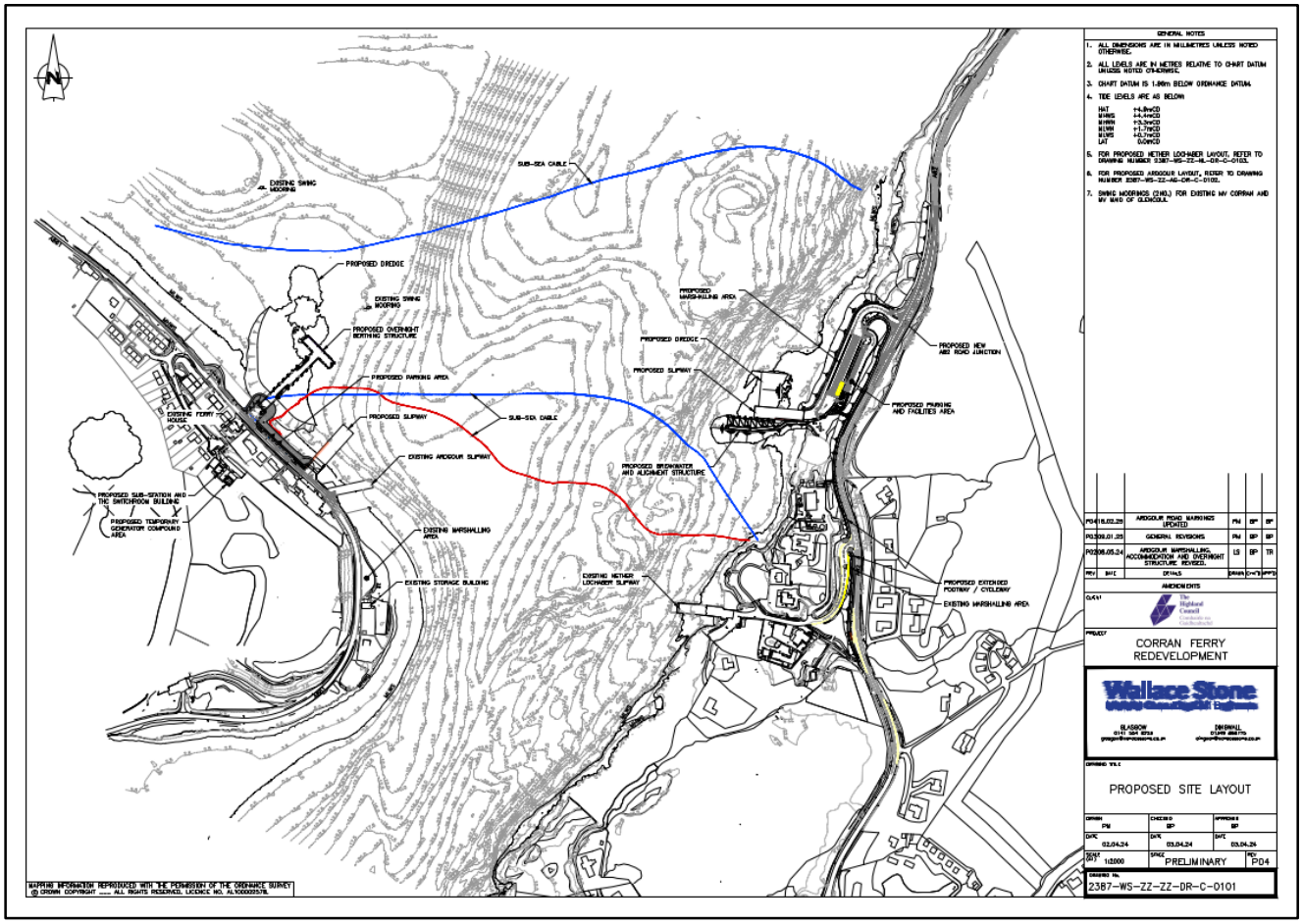
Please note that variances may occur due to rounding.

5 Proposed Site Layout and Operation, including Parking Provision

5.1 Description of the Proposed Development

The proposed CFIIS will comprise the replacement of the existing Ferry with one electric vessel, which require new and upgraded infrastructure on the Ardgour and Nether Lochaber sides of Corran Narrows. The layout of the proposed CFIIS is shown in Figure 17 and as drawing number 2387-WS-ZZ-ZZ-DR-C-0101..

Figure 17 Proposed Site Layout



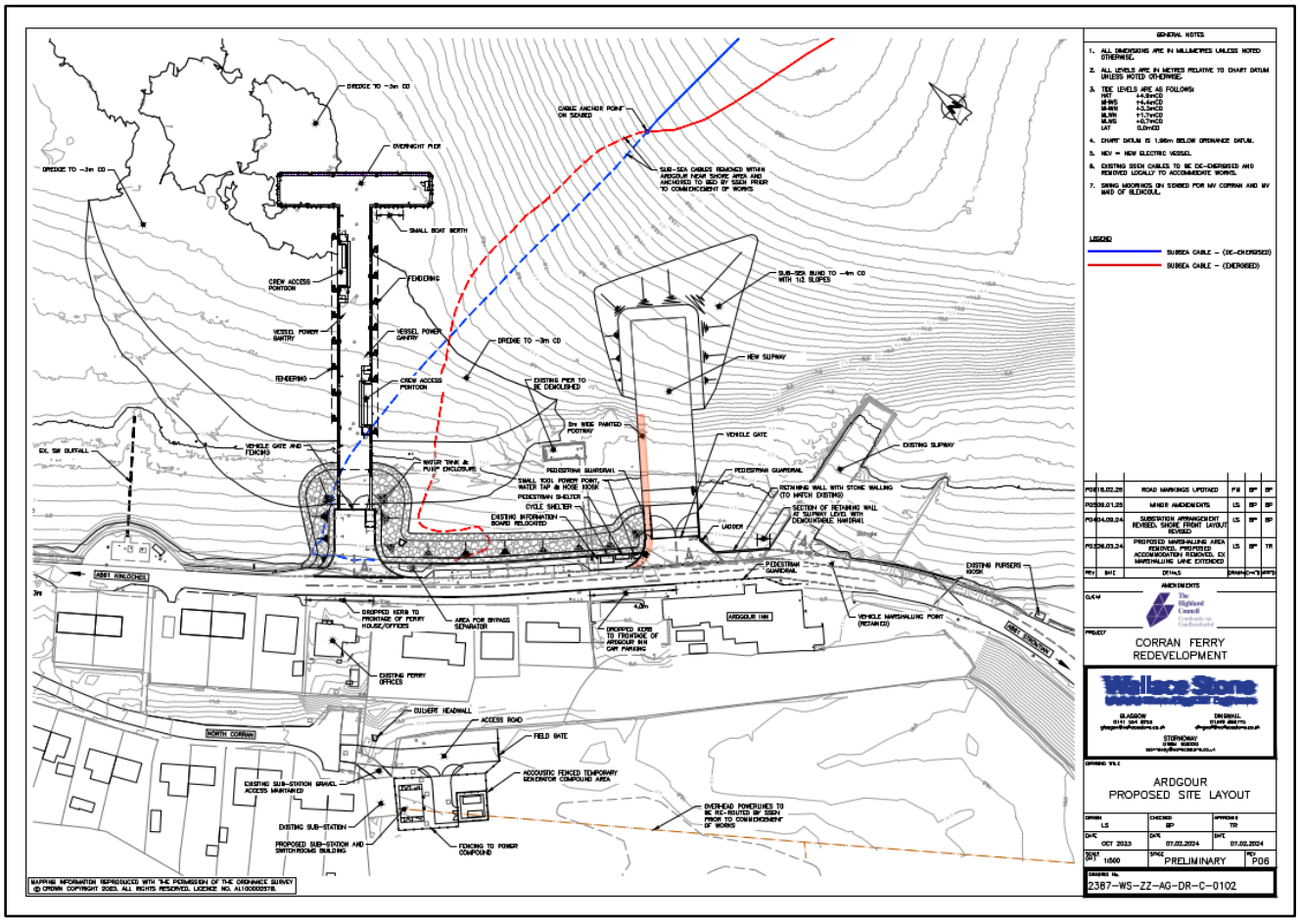
Since the Scoping Report was submitted, there has been a slight revision of the proposed CFIIS on the Ardgour side of the Narrows. No significant revisions have been made to the Nether Lochaber side since the TA Scoping Report. The proposed CFIIS elements are presented in the following sections for each side of Corran Narrows.

A Stage 1 Road Safety Audit (RSA) Report was undertaken with regards to the infrastructure improvements and is presented in Annex C.

5.1.1 Ardgour Side of the Narrows

The proposed site layout of the CFIIS on the Ardgour side of the Narrows is shown in Figure 18 and as drawing number 2387-WS-ZZ-AG-DR-C-0102.

Figure 18 Ardgour Side of the Narrows Proposed Site Layout



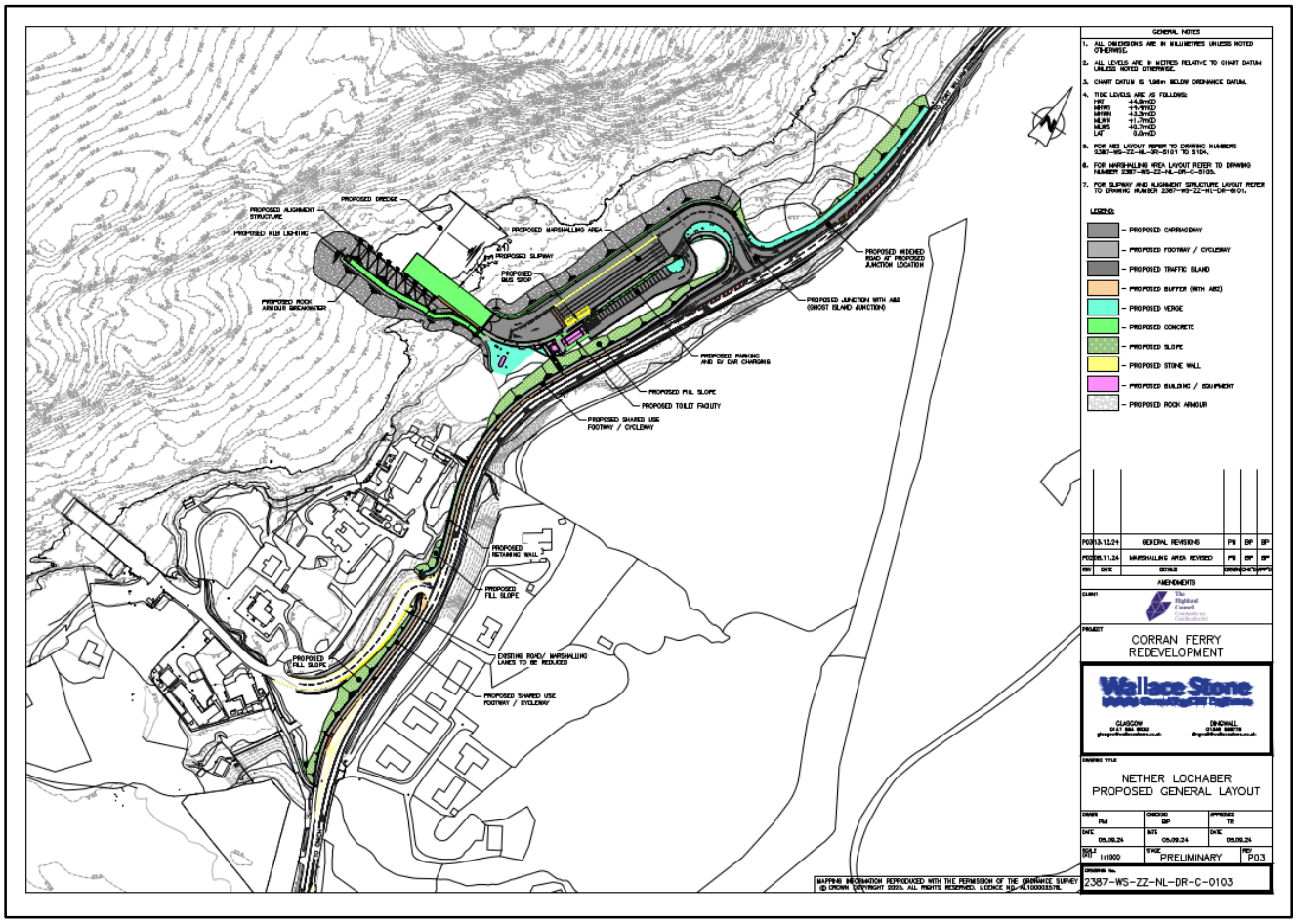
The elements of the proposed CFIIS on the Ardgour side of the Narrows are as follows:

- New Slipway;
- Demolition of the Existing Pier;
- Overnight Berth Structure, including Vessel Charge Infrastructure;
- Formalised parking and footway areas, including bicycle shelter;
- Interfaces with the A861 and sections of the A861 will be upgraded to two-way single carriageway in the area of the works;
- Vessel charging infrastructure and access within Field Area; and
- Associated services.

5.1.2 Nether Lochaber Side of the Narrows

The proposed site layout of the CFIIS on the Nether Lochaber side of the Narrows is shown in Figure 19 and as drawing number 2387-WS-ZZ-NL-DR-C-0103..

Figure 19 Nether Lochaber Side of the Narrows Proposed Site Layout



The elements of the proposed CFIIS on the Nether Lochaber side of the Narrows are as follows:

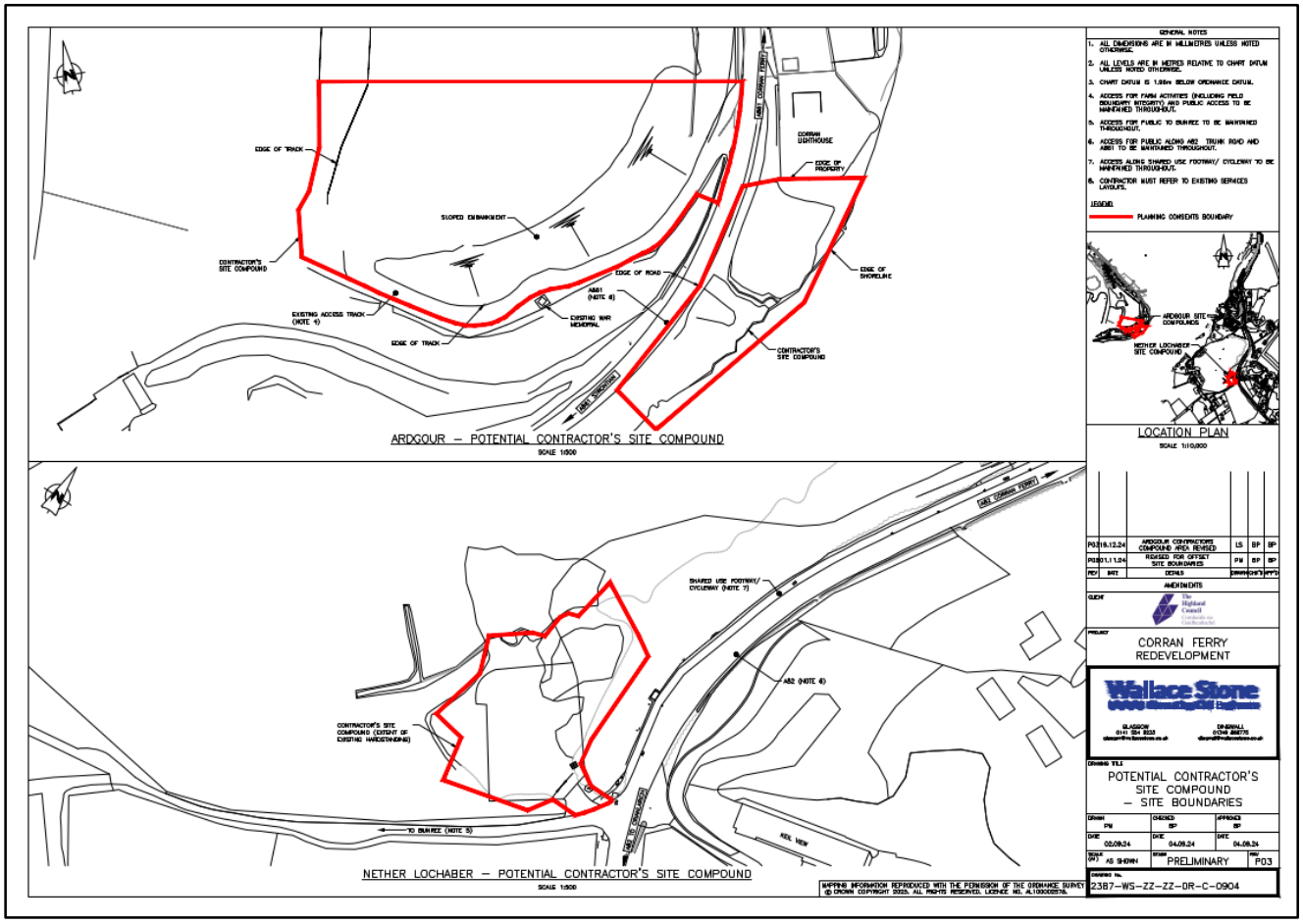
- New Slipway and Alignment Structure;
- New Marshalling Area, including Bus Stop;
- Parking Areas, including EV Car Charging;
- New Junction with the A82 (T);
- Toilet Facility;
- Shared-use Path;
- Bicycle Shelter;
- Purser's Kiosk; and
- Associated services.

5.1.3 Both Sides

To facilitate the construction of the proposed CFIIS, dredging on both sides of Corran Narrows will also be undertaken, as will the removal of sections of redundant sub-sea power cabling near the Ardgour infrastructure.

Construction compound areas will be provided on both sides of Corran Narrows and their locations are shown in Figure 20 and as drawing number 2387-WS-ZZ-ZZ-DR-C-0904 .

Figure 20 Locations of Construction Compounds



5.2 Operation

The proposed CFIIS and NEV have been designed in conjunction to address the specific engineering and environmental challenges of Corran Narrows. It is proposed that the NEV and the new infrastructure constructed for the CFIIS will work in combination to increase Ferry service capacity and resilience.

5.2.1 Ferry

The proposed 32 PCU NEV is intended to replace the existing 28 PCU capacity MV Corran as the primary service vessel on Corran Narrows and subsequently the 28 PCU capacity MV Corran will replace the 14 PCU capacity MV Maid of Glencoul as the standby vessel. By introducing the 32 PCU NEV, the capacity per sailing is therefore increased by 15% which will facilitate the movement of more vehicles per crossing and reducing the wait times for vehicles. It is considered that this will lead to shorter vehicle queue lengths in the marshalling areas and reducing the potential for waiting vehicles to back up onto the adjacent road network.

5.2.2 Ardgour Side of the Narrows

Overnight power charging, water bunkering and safer crew access to the vessels will be provided by the new overnight berthing structure at the Ardgour side.

If temporary power infrastructure (diesel generator and fuel tank) are required to cover shortfall in grid connection, it can be assumed that a weekly tanker delivery will be made to the field area via North Corran. It can be reasonably concluded that vehicles delivering fuel to the temporary power infrastructure can be accommodated along North Corran, given that from Google StreetView it can be seen that domestic heating oil tanks are located in this area, which suggests that these types of vehicles currently deliver fuel to the existing

dwellings along North Corran. A turning area will be provided to facilitate vehicle access and egress to the field area.

It should be noted that the existing marshalling area is to be retained as part of the Proposed Development.

5.2.3 Nether Lochaber Side of the Narrows

A new marshalling area will be provided at the new Nether Lochaber side of the Narrows. One lane is dedicated to buses, three lanes are dedicated to cars and one lane is dedicated to HGVs.

THC commissioned Wallace Stone to undertake a Marshalling Area Capacity Review[4] of the existing Corran Ferry slipways which provides recommendations for the proposed marshalling area which forms part of the CFIIS. In line with the recommendations outlined in the review, the marshalling lanes will be 400 m in total length i.e. each lane will be 80 m in length. The review estimates that this length of marshalling lane should be sufficient to cope with peak periods until 2042 if a single vessel were to operate on the current timetable of one sailing every 20 to 30 minutes and until 2058 if shuttling is in operation, involving two vessels sailing every 15 minutes. No review of the marshalling areas have been undertaken within this assessment as it has been covered in the Marshalling Area Capacity Review, upon which the design of the proposed CFIIS marshalling area is based.

During peak periods only, the bus marshalling lane may be used by other vehicles which would be managed by THC shore based staff. However, during times where buses are scheduled to service the bus stop, this would be avoided where at all possible.

The detailing of the Nether Lochaber marshalling area will also provide sufficient width to allow buses utilising the bus lane to onward travel across the Corran Ferry and / or turn and exit the Ferry Terminal to rejoin the A82 (T).

Dedicated entrance and exit lanes will be provided within the marshalling area which can be seen in further detail as drawing number. 2387-WS-ZZ-NL-DR-C-0103. An access road will connect the marshalling lanes to the newly provided ghost island junction with the A82 (T).

5.3 Parking

5.3.1 Ardgour Side of the Narrows

A total of eight formalised parking spaces will be provided on the seaward side of the A861 between the new slipway and the overnight berthing structure and three formal parking spaces will be provided on the berthing structure for staff.

5.3.2 Nether Lochaber Side of the Narrows

A total of 22 car parking spaces will be provided which includes two disabled parking bays. Another two parking spaces will be provided for oversized vehicles, such as LGVs. Three regular car parking spaces and one of the disabled parking bays will be equipped with EV car charging facilities.

In order to encourage and facilitate more sustainable modes of travel, it is proposed to provide electric charging points as part of the development proposals. These electric charging points will be provided in accordance with The Scottish Building Regulations – Proposed Changes to Energy Standards and Associated Topics (July 2021) document which outlines the following preferred options of the Scottish Government in relation to the EV charge points and enabling infrastructure in new non-residential buildings:

[4] The Highland Council 2022, Corran Ferry Slipways and Infrastructure Improvements, Marshalling Area Capacity Review

“For buildings with more than 10 non-residential car parking spaces, 1 in every 2 non-residential parking spaces to have ducting installed and 1 in every 10 non-residential parking spaces to provide an EV charge point socket with minimum 7kW output power rating.”

6 Proposed Access Strategy

6.1 Vehicular Site Access

6.1.1 Ardgour Side of the Narrows

It is proposed that vehicles wishing to access the Ferry from the upgraded Ardgour slipway, will join the existing marshalling area accessed via the A861. The marshalling lanes will lead to the upgraded slipway which will facilitate the boarding of vehicles onto the Ferry.

Vehicles exiting from the Ferry will use the upgraded slipway which will form a priority junction with the A861, in a similar form as is currently used.

Swept path analysis drawings of a car, an 8m long van, a 15m luxury coach and an artic low loader loading onto the ferry and unloading off the ferry via the upgraded slipway are provided as drawing numbers:

- 2387-WS-ZZ-AG-DR-C-2901
- 2387-WS-ZZ-AG-DR-C-2902
- 2387-WS-ZZ-AG-DR-C-2903
- 2387-WS-ZZ-AG-DR-C-2904
- 2387-WS-ZZ-AG-DR-C-2905
- 2387-WS-ZZ-AG-DR-C-2906
- 2387-WS-ZZ-AG-DR-C-2907
- 2387-WS-ZZ-AG-DR-C-2908

The swept path analysis drawings show that outlined vehicles can efficiently load from the upgraded slipway onto the ferry and conversely unload from the ferry onto the slipway.

Visibility splay drawings of the upgraded slipway is provided in as drawing numbers:

- 2387-WS-ZZ-AG-DR-C-2913

The visibility splay drawing shows that the desirable minimum sight stopping distance of 30 m can be achieved from a set back distance of 4.5 m. This is an improvement from the existing situation which is shown in drawing number 2387-WS-ZZ-AG-DR-C-2923.

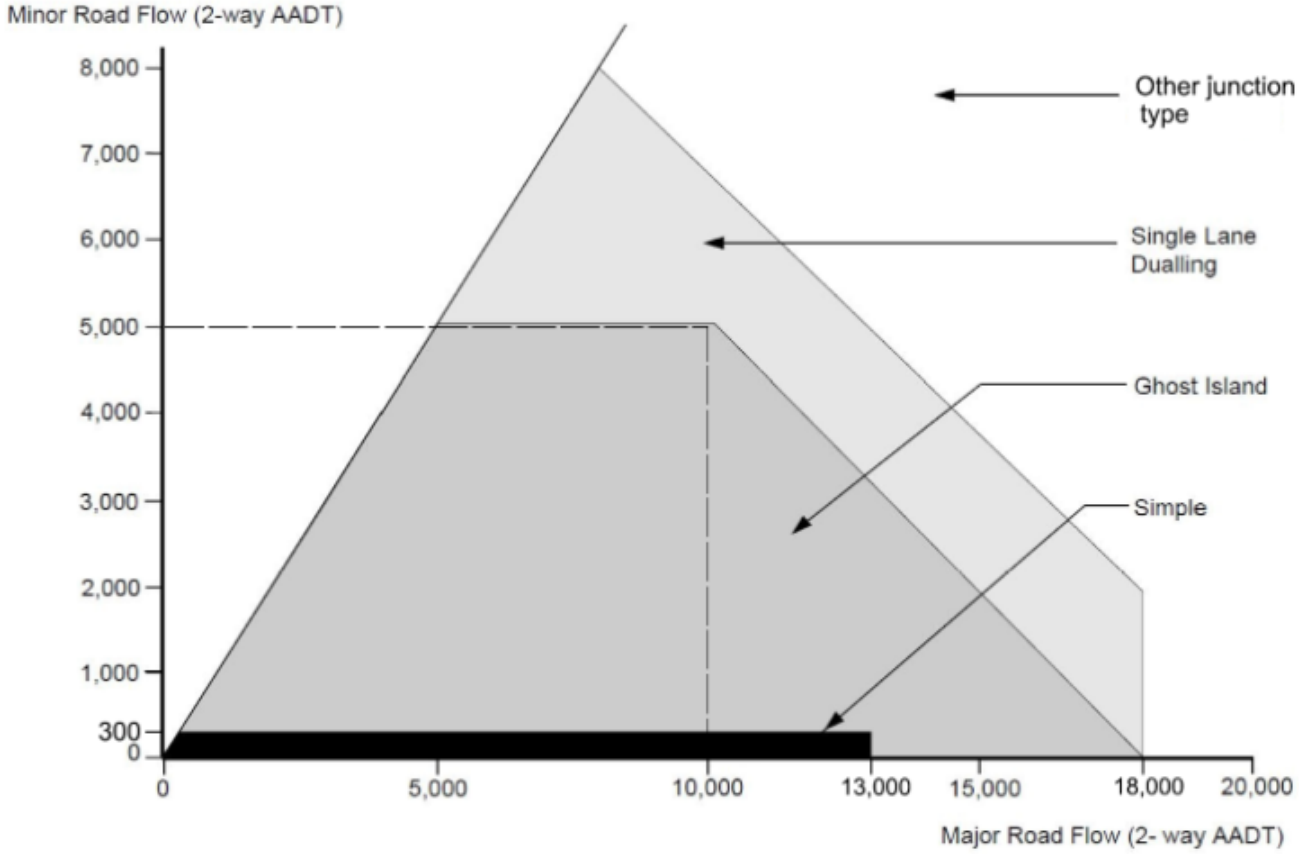
6.1.2 Nether Lochaber Side of the Narrows

A new access, in the form of a ghost island junction, leading to the new slipway will be constructed to the north of the existing slipway A82 (T) / A861 priority junction. This is the appropriate type of junction for this location in accordance with the Design Manual for Roads and Bridges (DMRB) – Geometric Design of At-grade Priority and Signal Controlled Junctions.

Paragraph 2.3.1 of the standards notes:

“The selection of priority junction and major road central treatment for single carriageway roads should be determined based on the standard of major road and traffic flows on both the major and minor roads. Figure 2.3.1 illustrates approximate levels of provision for varying traffic flows.

Figure 2.3.1 Approximate priority junction provision on single carriageway roads based on flows only



The turning count survey for Friday 05 April 2024 found that a total of 872 vehicles used the Ferry between 05:30 am and 22:30 pm, which would be the minor road flow (2-way AADT) and the ATC survey undertaken between 05 and 11 April 2024 found that the A82 (T) comprised a major road flow (2-way AADT) of 6,314 vehicles. From the DMRB's Figure 2.3.1, as shown on the previous page, the most appropriate type of junction at this location is a ghost-island priority junction. The level of traffic flow on the minor road (i.e. access to the Ferry Slipway) are significantly lower than those that would require a different junction arrangement such as a roundabout or a signalised junction.

The new junction will include a deceleration lane for left-turning vehicles from the A82 (T) south and a dedicated right-turning lane for vehicles waiting to turn into the junction from the A82 (T) north. The composition of the upgraded junction aims to improve the safety of vehicles travelling through the junction and to remove the bottleneck along the A82(T) caused by vehicles waiting to turn into the slipway access.

The Applicant has been in discussions with Transport Scotland with regards to Departures from Standard regarding the A82 (T) works and applications for departures from standards have been submitted. These include the requests for departures from standards for the immediate junction approach south-bound visibility, immediate junction approach north-bound visibility and omission of hard strip on landward edge of junction. It should be noted that the proposed layout of the new junction represents a significant improvement compared to the existing situation. The junction approach visibility drawings are provided in drawing numbers:

- 2387-WS-ZZ-NL-DR-C-5914
- 2387-WS-ZZ-NL-DR-C-5915

Visibility splays of the proposed new A82 (T) access junction are provided in drawing number:

- 2387-WS-ZZ-NL-DR-C-5916

The visibility splay drawing shows that the desirable minimum sight stopping distance of 160 m can be achieved from a set back distance of 4.5 m. This is an improvement from the existing situation at the A861 / A82 (T) priority junction which is shown in in Appendix P.1 as drawing number 2387-WS-ZZ-NL-DR-C-5913.

Swept path assessments showing different vehicle types which include car, van, 15 m luxury coach and low loader entering and exiting the proposed access junction on the A82 (T) as well as loading onto the ferry and unloading off the ferry via the new slipway and manoeuvring through the car park are provided in drawing numbers:

- 2387-WS-ZZ-NL-DR-C-5901
- 2387-WS-ZZ-NL-DR-C-5902
- 2387-WS-ZZ-NL-DR-C-5903
- 2387-WS-ZZ-NL-DR-C-5904
- 2387-WS-ZZ-NL-DR-C-5905
- 2387-WS-ZZ-NL-DR-C-5906
- 2387-WS-ZZ-NL-DR-C-5907
- 2387-WS-ZZ-NL-DR-C-5908
- 2387-WS-ZZ-NL-DR-C-5909
- 2387-WS-ZZ-NL-DR-C-5910

The new access junction will lead to the proposed marshalling area and the separate parking area. Vehicles wishing to access the Ferry will be directed through signage to join the marshalling area before accessing the proposed slipway to enter the Ferry. The proposed marshalling area is shown in drawing number:

- 2387-WS-ZZ-NL-DR-C-5105

Vehicles exiting from the Ferry will do so by the proposed slipway and will follow the exit lane towards the new junction with the A82 (T).

The directional signage strategy is shown in drawing numbers:

- 2387-WS-ZZ-NL-DR-C-5612
- 2387-WS-ZZ-NL-DR-C-5613
- 2387-WS-ZZ-NL-DR-C-5614
- 2387-WS-ZZ-NL-DR-C-5615
- 2387-WS-ZZ-NL-DR-C-5616
- 2387-WS-ZZ-NL-DR-C-5617
- 2387-WS-ZZ-NL-DR-C-5621
- 2387-WS-ZZ-NL-DR-C-5622
- 2387-WS-ZZ-NL-DR-C-5923

6.2 Pedestrian and Cycle Access

6.2.1 Ardgour Side of the Narrows

A 2 m wide painted footway will be provided on the slipway for a formalised pedestrian access route, including cyclists pushing their bikes, between the shore and the slipway. This connects to a footway leading to the proposed cycle parking shelter, pedestrian shelter and the car parking area. Separate covered cycle parking shelter and pedestrian shelter are provided, with the pedestrian shelter including suitable perch seating.

In addition, a 2m wide footway will be formed in front of Ardgour Inn by introducing a guardrail to separate pedestrians from the road traffic in this area.

6.2.2 Nether Lochaber Side of the Narrows

A new shared use path will be provided, which will connect the new slipway to the existing bus stop along the A82 (T), to the south. A cycle parking shelter will be provided as part of the proposals. The proposed shared-use path will retain the active transport link to the Ferry service, which includes the NCN. The path will comprise a bituminous surface and will be segregated from the A82 (T) by a verge buffer. The shared path also connects to steps which provides a more direct access to the new slipway.

It should be noted that the new shared-path provides an improvement to the existing situation for users of the Ferry wishing to access the bus stops along the A82 (T), as sections of the existing path are quite steep and not suitable for individuals with mobility issues, novice cyclists or people pushing prams. The new shared-path has been designed in accordance with Cycling by Design[5] with a width of 2.5 m.

The walking / cycling distance along the shared path from the new slipway to the existing northbound bus stop on the A82 (T) will be approximately 620 m and the walking distance via the steps will be approximately 370 m. It should be noted that the steps will include a wheeling ramp to make the steps accessible to cyclists. The walking / cycling distance to the existing southbound bus stop on the A82 (T) will be approximately 790 m and the walking distance via the steps will be approximately 540 m. These walking distances are in line with those outlined in PAN75 and TS's Transport Assessment Guidelines for the distance to local facilities. However, note comments in 6.3 (Public Transport Access) below.

In terms of additional enhancement of pedestrian and cycling facilities, tactile paving is provided at crossing points and at the accesses to the steps to assist visually impaired pedestrians and a raised table will be provided to facilitate pedestrians / cyclists crossing the shared path which crosses the entrance to the Nether Lochaber slipway's parking area. A cycle shelter will also be provided at the Nether Lochaber side of the Narrows.

Each end of the Toilet Facility Building also includes an overhang area which will include benches for pedestrians and access to sockets to allow recharging of electric bicycles, which will be provided as part of the Proposed Development..

6.3 Public Transport Access

There will be no proposed change to the public transport provision on the Ardgour side of the Narrows.

On the Nether Lochaber side of the Narrows, the 506 Shiels Bus Service from Kilchoan to Fort William and the 507 Bus Service from Lochaline to Fort William will be re-routed to the new Nether Lochaber marshalling area where there will be a bus stop with suitable raised kerbing provided within the dedicated bus lane.

Since bus frequency is low, the shared path will include give ways and be demarked with tactile paving strips at each end of bus bay to delineate the bus boarding area.

It should be noted that the marshalling area on the Nether Lochaber side is designed so that a bus can service the proposed bus stop within the marshalling area to facilitate a potential additional stop for northbound / southbound bus service (on A82) within the ferry terminal, should this be introduced in the future.

[5] Transport Scotland 2021, Cycling by Design. Available at: https://www.transport.gov.scot/media/50323/cycling-by-design-update-2019-final-document-15-september-2021-1.pdf

6.4 Internal Road Layout

6.4.1 Ardgour Side of the Narrows

The operation of the internal road layout will generally operate predominantly as is currently in place, however the marshalling lane will extend to the new slipway. Signage and road markings are located at the existing marshalling area to direct traffic to use the marshalling lanes effectively.

THC have also installed traffic cameras and a purser's kiosk adjacent to the marshalling area with the intention of monitoring and managing the marshalling area with a dedicated shored based employee in order to maximise the marshalling area's existing capacity.

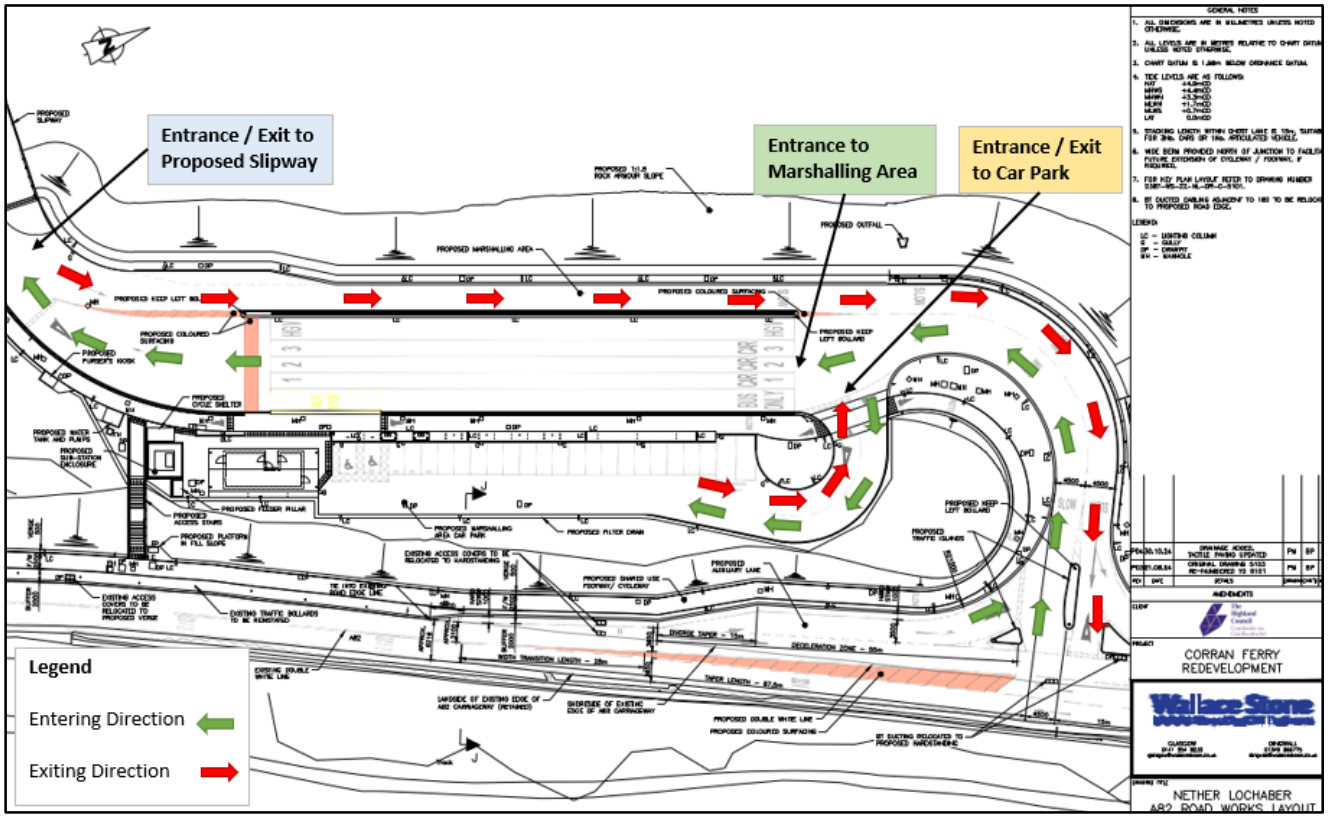
6.4.2 Nether Lochaber Side of the Narrows

Signage will be appropriately placed to direct traffic waiting to board the Ferry where to wait and how to use the marshalling area effectively. In addition, THC will install traffic cameras and a purser's kiosk adjacent to the marshalling area with the intention of managing the marshalling area with a dedicated shored based employee in order to maximise the marshalling area's capacity.

Figure 20 shows the layout of the internal road network, including the marshalling area and the car parking area. Access to the slipway is via the marshalling area. Prior to the marshalling area, vehicles can enter the proposed car park area. Vehicles exiting the parking area join the main exit lane towards the A82 (T).

A 2m wide pedestrian walkway will be provided along the front of the marshalling lane to allow access from marshalling lanes to the toilet facility area.

Figure 21 Nether Lochaber Side Internal Road Layout



7 Trip Generation and Distribution

7.1 Introduction

The trip generation and distribution estimations for the Construction Phase and Operational Phase are presented in the following sections.

7.2 Construction Phase

During the approximate 16 month construction period, the following traffic will require access to the site:

- staff transport, in cars or minibuses;
- construction equipment and materials, deliveries of machinery and supplies such as crushed rock and concrete; and
- components relating to the proposed CFIIS and associated infrastructure.

7.2.1 Construction Trip Derivation

Average weekly traffic flow data was used to establish the construction trips associated with the proposed CFIIS. These trip estimates were based on material quantities and an indicative construction programme provided by Wallace Stone. As a robust assessment, it has been assumed that there are four weeks per month, and five and a half days per week.

As the assessment is based upon an indicative construction programme for the proposed CFIIS, it should be noted that alterations in this programme may increase or decrease traffic flows.

Construction trip generation estimates are provided in Annex D. The peak of construction activity is expected to occur in the beginning of Month nine. During the peak construction period of the proposed CFIIS it is estimated that, daily, there will be 122 HGV movements (61 inbound trips and 61 outbound trips), of which 108 HGV movements (54 inbound trips and 54 outbound trips) would be associated with the construction of the Nether Lochaber side of the Narrows and 14 HGV movements (7 inbound trips and 7 outbound trips) would be associated with the construction of the Ardgour side of the Narrows. In addition to this, a total of 50 Car / LGV movements (25 inbound trips and 25 outbound trips) would be associated with staff trips.

7.2.2 Distribution of Construction Trips

The trip estimates have been based upon first principle estimates of traffic movements to and from the proposed CFIIS, having established the likely volumes of construction materials, resources and components.

The distribution of development traffic on the network would vary depending on the types of loads being transported. The assumptions for the distribution of construction traffic during the peak months would be as follows:

- Deliveries associated with aggregates, rock armour and ready-mix concrete will arrive via the A82 (T) to the north of the site;
- Staff working at the site are likely to be based locally and it is anticipated that 80% will travel from the north of the A82 (T) and 20% will travel from the south of the A82 (T);
- General site deliveries will be from Fort William via the A82 (T) to the north of the site. These are generally smaller rigid HGV vehicles; and
- Construction vehicles and staff trips to the Ardgour side of the CFIIS will arrive from the A82 (T) and A861 to the site via the Ferry.

Following the distribution and assignment of traffic flows to the study area network, the resultant daily traffic during the peak of construction are summarised in Table 8.

Table 8 Peak Construction Traffic (Daily)

Ref. No.	Location	Cars / LGV	HGV	Total
4	A82 (T) north of proposed new access junction to the improved Nether Lochaber Slipway	40	98	138
5	A82 (T) south of proposed new access junction to the improved Nether Lochaber Slipway	10	18	28
6	A861 north of Ardgour Slipway	0		0
7	A861 south of Ardgour Slipway	0	6	6

Please note minor variances due to rounding may occur.

It should be noted that it is not anticipated that not all of the construction vehicles (14 two-way HGV movements) associated with the construction of the Ardgour side of the Narrows would impact on the A861 at the count point locations in Table 7, as eight construction HGV two-way movements are anticipated to arrive to the Ardgour site from the A82 (T) via the Ferry.

7.3 Operational Phase

7.3.1 Operational Trip Derivation 2027 – Opening Year

As the Corran Ferry is currently in operation, existing Ferry daily carryings are included in the study area links. These are presented in Table 9.

Table 9 Existing Ferry Daily Carryings on the Study Area Links (2024)

Ref. No.	Location	Cars / LGV	HGV	Total
4	A82 (T) north of proposed new access junction to the improved Nether Lochaber Slipway	247	92	339
5	A82 (T) south of proposed new access junction to the improved Nether Lochaber Slipway	247	92	339
6	A861 north of Ardgour Slipway	39	17	56
7	A861 south of Ardgour Slipway	466	163	629

Please note minor variances due to rounding may occur.

The assessment assumes that the annual growth of ferry carrying traffic is 2.1%, which was based on the annual growth rate used in Marshalling Area Capacity Review[6]. Data from the observed turning counts at the Ardgour Slipway undertaken on the Friday was used to estimate the number of carryings per day on the road links as a robust assessment, as Friday carryings were higher than the observed Saturday carryings.

7.3.2 Operational Trip Distribution 2027 – Opening Year

The distribution of the carryings are based on the observed weekday turning movements at the A82 (T) / A861 priority junction and the A861 / Ardgour Ferry Terminal slipway junction.

Following the distribution and assignment of traffic flows to the study area network, the resultant increases in operational traffic between 2024 and 2027 are summarised in Table 10.

Table 10 Increases in Daily Operational Traffic (2024 – 2027)

Ref. No.	Location	Cars / LGV	HGV	Total
4	A82 (T) north of proposed new access junction to the improved Nether Lochaber Slipway	16	6	22
5	A82 (T) south of proposed new access junction to the improved Nether Lochaber Slipway	16	6	22

[6] The Highland Council 2022, Corran Ferry Slipways and Infrastructure Improvements, Marshalling Area Capacity Review

Ref. No.	Location	Cars / LGV	HGV	Total
6	A861 north of Ardgour Slipway	3	1	4
7	A861 south of Ardgour Slipway	30	10	40

Please note minor variances due to rounding may occur.

7.3.3 Operational Trip Derivation 2046 – Sensitivity Assessment

A sensitivity assessment has been undertaken for the year 2046 in line with the sensitivity test undertaken as part of the junction capacity assessment later in this report. It is assumed that the annual growth of ferry carrying traffic was 2.1% between 2024 and 2046.

7.3.4 Operational Trip Distribution 2046 – Sensitivity Review

As with the 2027 operational trips, the distribution of the Ferry carryings are based on the observed weekday turning movements at the A82 (T) / A861 priority junction and the A861 / Ardgour Ferry Terminal slipway junction.

Following the distribution and assignment of traffic flows to the study area network, the resultant increases in operational traffic between 2024 and 2046 are summarised in Table 11.

Table 11 Increases in Daily Operational Traffic (2024 – 2046)

Ref. No.	Location	Cars / LGV	HGV	Total
4	A82 (T) north of proposed new access junction to the improved Nether Lochaber Slipway	143	53	197
5	A82 (T) south of proposed new access junction to the improved Nether Lochaber Slipway	143	53	197
6	A861 north of Ardgour Slipway	23	10	32
7	A861 south of Ardgour Slipway	270	94	365

Please note minor variances due to rounding may occur.

7.4 Committed Developments

A review of THC's online planning portal was undertaken to determine committed developments which are considered to have significant associated trips to be included in the assessment.

On the Nether Lochaber side, the review found the following:

- Upper Achintore Residential Development (Planning Application Ref. 19/00897/PIP) has been granted planning consent and is to comprise a new residential development of up to 325 dwellings including landscaping, access and associated site development works. A review of the TA shows that during the AM peak there are two northbound trips and seven southbound trips and during the PM peak nine northbound trips and five southbound trips along the A82 (T) to the south of West End Roundabout. This level of trips along the A82 (T) is not considered significant and associated trips are therefore considered to be included in the NRTF high growth factors along the A82 (T).
- The proposed Lochaber Smelter (Planning Application Ref. 21/02413/FUL) has been granted planning consent and is to comprise the construction of an aluminium recycling and billet casting facility, associated hardstanding, infrastructure and landscaping. From reviewing the online planning documents, there is no transport trip information on the planning portal. It is therefore considered that the associated committed development trips are included in the NRTF high growth factors along the A82 (T).
- The Phase 2 of the proposed residential development (Planning Application Ref. 22/03479/MSC) associated with the Mixed-use Masterplan (Planning Application Ref. 18/03647/PIP) located on land 400 m to the north-east of Blar Mhor Industrial Estate, Lochyside has been granted planning consent. There is no

TA included as part of the available online planning documents. It is therefore considered that the associated committed development trips are included in the NRTF growth factors along the A82 (T).

- The proposed hydropower scheme in Glen Gour, 5km from the CFIIS (22/00338/S42, associated with approved 17/01675/FUL) was granted planning permission in November 2022. A review of the online planning documents did not show trip information and as such, this scheme cannot be included as committed development. It is therefore considered that the associated committed development trips are included in the NRTF low growth factors along the A861.
- Development of land Southwest of Inchree Chalets, Righ Crescent, Onich. There are two planning applications covering this land. One permitted for erection of three houses and three annexes (23/03511/FUL) and one permitted for siting of seven pods (24/02565/FUL). A review of the online planning documents associated with both schemes did not show trip information and as such, these schemes cannot be included as committed development. It is therefore considered that the associated committed development trips are included in the NRTF high growth factors along the A82 (T).

The review did not find any consented schemes which should be included in the assessment on the Ardgour side which would generate a significant level of traffic along the proposed CFIIS's study area.

With regards to the construction of the consented developments, any crossover of construction traffic with the proposed CFIIS flows would be addressed via an overarching traffic management plan. The inclusion of further traffic flows in the baseline would dilute the potential impact that the proposed CFIIS would have. As such, the approach taken is considered to be an overly robust assessment.

The use of NRTF high traffic growth assumptions along the A82 (T) and NRTF low growth assumptions along the A861 have provided a robust future year assessment scenario to account for the level of trip generation that can occur as a result of the types of local development that may occur within the study area and the effects of tourist traffic on the network.

7.5 Proposed New A82 (T) / Nether Lochaber Slipway Access

7.5.1 Access Junction Assessment Trip Derivation

Future baseline traffic information on the A82 (T) was estimated from the 2024 surveyed traffic flows at the existing A82 / Corran Ferry slipway priority junction. NRTF high growth factors were applied to the 2024 through movements on the A82 (T) to estimate the 2027 and 2046 flows. The NRTF high growth from 2024 to 2027 is 1.040 and the from 2027 to 2046 is 1.246.

As a robust assessment, the future year carryings were estimated using August daily trip data from information provided by THC, and shown in Annex E, as these were the highest daily carryings over the course of the year.

An annual growth of 2.1% (as per the Marshalling Area Capacity Review[7] prepared for THC) was used to estimate 2027 and 2046 carryings.

The observed turning count survey information was used to distribute the estimated carryings throughout the day in order to estimate the peak hours for carryings.

The observed survey information noted above was based on the survey data obtained at Ardgour Slipway as the survey data obtained at the A82 / Existing Corran Ferry Slipway may also include trips to local dwellings and tourist accommodation along the access to the slipway.

[7] The Highland Council 2022, Corran Ferry Slipways and Infrastructure Improvements, Marshalling Area Capacity Review

7.5.2 Access Junction Assessment Trip Distribution

The distribution of the Ferry carryings traveling north and south at the new A82 / Upgraded Corran Slipway Junction were based on the observed distribution at the existing junction during the junction peak hour.

Following the distribution and assignment of traffic flows to the study area network, the resultant daily traffic during the peak of operation are summarised in the Junction 9 reports in Annex F.

8 Traffic Impact Assessment, including Mitigation Measures

8.1 Introduction

Traffic impact assessments for the Construction Phase and Operational Phase are presented in the following sections as well as a junction assessment of the proposed new A82 (T) / Nether Lochaber slipway access junction, which was undertaken to assess the operation of the junction at year of opening and in the future year of 2046.

8.2 Construction Impact

The peak month traffic data was combined with the future year (2025) (see Table 5) traffic data to allow a comparison between the baseline results to be made. The increase in traffic volumes is illustrated in percentage increases for each class of vehicle. This is illustrated in Table 12.

Table 12 Peak Daily Construction Traffic Network Impact

Ref. No.	Location	Cars/LGV	HGV	Total	Cars/LGV % Increase	HGV % Increase	Total % Increase
4	A82 (T) north of proposed new access junction to the improved Nether Lochaber Slipway	4,642	1,869	6,511	0.87%	5.51%	2.16%
5	A82 (T) south of proposed new access junction to the improved Nether Lochaber Slipway	4,681	1,736	6,418	0.21%	1.07%	0.44%
6	A861 north of Ardgour Slipway	214	85	300	0.00%	0.00%	0.00%
7	A861 south of Ardgour Slipway	631	264	896	0.00%	2.36%	0.69%

Please note minor variances due to rounding may occur.

The total traffic movements are not predicted to increase by more than 10% on any of the assessed locations with the highest total traffic movement increase within the study area is on the 2.16% on the A82 (T) north of the location of the new A82 (T) ghost island junction. With regards to HGV traffic movements, the highest predicted increase is 5.51% on the A82 (T) north of the location of the new A82 (T) ghost island junction. It should be noted that the construction phase is not permanent and the peak of construction activities is short lived when looking at the overall construction programme, as shown in Annex D.

A review of existing theoretical road capacity has been undertaken using The NESA Manual, formerly part of the Design Manual for Roads and Bridges, Volume 15, Part 5. The theoretical road capacity has been estimated for each of the road links for a 12-hour period that makes up the study area. The results are summarised in Table 13.

Table 13 2025 Daily Traffic (12hr) Capacity Review Summary

No.	Location	2025 Baseline Flow	2025 Base + Development Flows	Theoretical Road Capacity (12 hr)	Spare Road Capacity (%)
4	A82 (T) north of proposed new access junction to the improved Nether Lochaber Slipway	6,374	6,536	21,600	70%
5	A82 (T) south of proposed new access junction to the improved Nether Lochaber Slipway	6,390	6,400	21,600	70%
6	A861 north of Ardgour Slipway	300	300	3,360	91%
7	A861 south of Ardgour Slipway	889	889	19,200	95%

Please note minor variances due to rounding may occur.

The results indicate there are no road capacity issues with the addition of construction traffic associated with the proposed CFIIS and significant spare capacity exists within the road network to accommodate all construction phase traffic.

8.3 Operational Impact

8.3.1 Operational Impact – 2027 Opening Year

The increase in operational traffic data was combined with the future year (2027) (see Table 6) traffic data to allow a comparison between the baseline results to be made. The increase in traffic volumes is illustrated in percentage increases for each class of vehicle. This is illustrated in Table 14.

Table 14 Peak Daily Operational Traffic Network Impact (2027)

Ref. No.	Location	Cars/LGV	HGV	Total	Cars/LGV % Increase	HGV % Increase	Total % Increase
4	A82 north of proposed new access junction to the improved Nether Lochaber Slipway	4,743	1,825	6,569	0.7%	0.6%	0.7%
5	A82 south of proposed new access junction to the improved Nether Lochaber Slipway	4,815	1,770	6,586	0.7%	0.6%	0.7%
6	A861 north of Ardgour Slipway	219	87	307	1.2%	1.3%	1.2%
7	A861 south of Ardgour Slipway	668	272	940	4.7%	4.0%	4.5%

Please note minor variances due to rounding may occur.

The total traffic movements are not predicted to increase by more than 10% on any of the assessed locations with the highest total traffic movement increase within the study area is on the 4.5% on the A861 south of Ardgour Slipway. With regards to HGV traffic movements, the highest predicted increase is 4.0%, also on the A861 south of Ardgour Slipway.

It should be noted that the assessment is based on April carryings and April ADT flows, and it is assumed that background traffic and Ferry carryings will fluctuate at similar levels throughout the year. However, if this is not the case. As such, the assessment is considered satisfactory to address the anticipated fluctuations in impact throughout the year.

A review of existing theoretical road capacity has been undertaken using The NESA Manual, formerly part of the Design Manual for Roads and Bridges, Volume 15, Part 5. The theoretical road capacity has been estimated for each of the road links for a 12-hour period that makes up the study area. The results are summarised in Table 15.

Table 15 2027 Daily Traffic (12hr) Capacity Review Summary

Ref. No.	Location	2027 Baseline Flow	2027 Base + Development Flows	Theoretical Road Capacity (12 hr)	Spare Road Capacity (%)
4	A82 north of proposed new access junction to the improved Nether Lochaber Slipway	6,547	6,569	21,600	70%
5	A82 south of proposed new access junction to the improved Nether Lochaber Slipway	6,564	6,586	21,600	70%
6	A861 north of Ardgour Slipway	304	307	3,360	91%
7	A861 south of Ardgour Slipway	899	940	19,200	95%

Please note minor variances due to rounding may occur.

The results indicate there are no road capacity issues with the addition of operational traffic associated with the Proposed Development and significant spare capacity exists within the road network to accommodate all construction phase traffic.

It is acknowledged that Ferry carryings will continue to increase annually following the opening of the proposed CFIIS. The Spare Road Capacity percentages outlined in Table 12 suggests that there is sufficient spare road capacity to accommodate additional flows. It should also be noted that these road links currently experience fluctuations throughout the year as a result of the Ferry carryings and tourist traffic, as can be seen in the differing carryings per day for each month which is outlined in Annex E.

8.3.2 Operational Impact – 2046 Sensitivity Test

The increase in operational traffic data was combined with the future year (2046) (see Table 7) traffic data to allow a comparison between the baseline results to be made. The increase in traffic volumes is illustrated in percentage increases for each class of vehicle. This is illustrated in Table 16.

Table 16 Peak Daily Operational Traffic Network Impact (2046)

Ref. No.	Location	Cars/LGV	HGV	Total	Cars/LGV % Increase	HGV % Increase	Total % Increase
4	A82 north of proposed new access junction to the improved Nether Lochaber Slipway	6,034	2,320	8,355	2.4%	2.3%	2.4%
5	A82 south of proposed new access junction to the improved Nether Lochaber Slipway	6,123	2,252	8,376	2.4%	2.4%	2.4%
6	A861 north of Ardgour Slipway	254	102	357	9.8%	10.7%	10.0%
7	A861 south of Ardgour Slipway	951	373	1,324	39.7%	33.9%	38.0%

Please note minor variances due to rounding may occur.

The highest total traffic movements increase within the study area is on the A861 to the south of Ardgour Slipway where it is predicted to increase by 38.0%. The next location with the highest total traffic movements within the study area is on the A861 to the north of the Slipway (10%). Increases in total movements along the A82 (T) are below 3%, which are considered to be below daily traffic variation levels on the road network.

As with the 2027 operational assessment, the 2046 sensitivity assessment is based on April carryings and April ADT flows, and it is assumed that background traffic and Ferry carryings will fluctuate at similar levels throughout the year. As such, the assessment is considered satisfactory to address the anticipated fluctuations in impact throughout the year.

A review of existing theoretical road capacity has been undertaken using The NESA Manual, formerly part of the Design Manual for Roads and Bridges, Volume 15, Part 5. The theoretical road capacity has been estimated for each of the road links for a 12-hour period that makes up the study area. The results are summarised in Table 17.

Table 17 2046 Daily Traffic (12hr) Capacity Review Summary

Ref. No.	Location	2046 Baseline Flow	2046 Base + Development Flows	Theoretical Road Capacity (12 hr)	Spare Road Capacity (%)
4	A82 north of proposed new access junction to the improved Nether Lochaber Slipway	8,159	8,355	21,600	61%
5	A82 south of proposed new access junction to the improved Nether Lochaber Slipway	8,179	8,376	21,600	61%
6	A861 north of Ardgour Slipway	324	357	3,360	89%
7	A861 south of Ardgour Slipway	960	1,324	19,200	93%

Please note minor variances due to rounding may occur.

The results indicate there are no road capacity issues with the addition of operational traffic associated with the Proposed Development and significant spare capacity exists within the road network to accommodate all operational phase traffic.

8.4 Junction Capacity Assessment - Proposed New A82 (T) / Nether Lochaber Slipway Access

8.4.1 Introduction

A junction modelling assessment of the proposed new A82 (T) / Nether Lochaber slipway junction has been undertaken in order to assess the operation of the junction with regards to year of opening and future year flows.

8.4.2 Scenario Testing

The following scenarios were modelled as part of the traffic modelling assessment:

- AM and PM Peak 2027 Baseline + Ferry Carryings (Weekday);
- AM and PM Peak 2027 Baseline + Ferry Carryings (Weekend);
- AM and PM Peak 2046 Baseline + Ferry Carryings (Weekday); and
- AM and PM Peak 2046 Baseline + Ferry Carryings (Weekend).

8.4.3 Traffic Impact Assessment Results

The proposed new A82 (T) / Nether Lochaber slipway junction was assessed using the industry standard TRL Software Junction 9: PICADY 9 in order to understand the operation of the proposed junction. Traffic flow information was inputted into the model in 15 minute profiles as a robust assessment.

The operation of the junctions are interpreted by the PICADY result outputs which are described below:

- Queues: Queues are measured in PCUs. Junctions 9 assumes that 1 PCU = 5.75m.
- Ratio of Flow to Capacity (RFC): This is an indicator of the likely performance of a junction and a ratio of 0.85 is the standard threshold used for junction assessments.

It should be noted that only the highest RFC and Queue values recorded during the modelled period are reported. The Junction 9 reports are presented in Annex F, where further information on inputs into the model and results are shown.

The junction capacity assessment assumes that the internal marshalling areas can accommodate waiting vehicles and operates efficiently.

Proposed new A82 (T) / Nether Lochaber slipway junction PICADY Assessment results

A summary of the results of the junction capacity assessments are presented in Table 18 below for the weekday assessment and Table 19 for the weekend assessment.

2027 and 2046 Weekday Assessment

Table 18 Summary of Proposed new A82 (T) / Nether Lochaber slipway junction (Weekday Assessment)

Turning Movement	AM Peak		PM Peak	
	Queue (PCU)	RFC	Queue (PCU)	RFC
	2027			
Slipway Access – A82 (T) (North)	0	0.10	0	0.21
Slipway Access – A82 (T) (South)	0	0.27	0	0.23
A82 (T) (North) – Slipway Access	0	0.16	0	0.20
	2046			
Slipway Access – A82 (T) (North)	0	0.16	1	0.34
Slipway Access – A82 (T) (South)	1	0.47	1	0.40
A82 (T) (North) – Slipway Access	0	0.24	1	0.31

The results in Table 18 suggest that the junction operates within capacity with maximum RFC values in the 2027 and 2046 AM and PM peak periods below the 0.85 threshold. The results suggest that the maximum queue length along the A82 (T) is 1 PCU and is recorded in 2046.

2027 and 2046 Weekday Assessment

Table 19 Summary of Proposed new A82 (T) / Nether Lochaber slipway junction (Weekend Assessment)

Turning Movement	AM Peak		PM Peak	
	Queue (PCU)	RFC	Queue (PCU)	RFC
	2027			
Slipway Access – A82 (T) (North)	0	0.16	1	0.41
Slipway Access – A82 (T) (South)	1	0.53	0	0.05
A82 (T) (North) – Slipway Access	0	0.09	0	0.09
	2046			
Slipway Access – A82 (T) (North)	1	0.33	2	0.65
Slipway Access – A82 (T) (South)	6	0.90	0	0.08
A82 (North) – Slipway Access	0	0.14	0	0.15

The results in Table 19 suggest that the junction operates within capacity for the 2027 AM and PM peak periods with maximum RFC values below the 0.85 threshold.

The results for the 2046 peak periods suggest that the junction will operate over the RFC threshold of 0.85 during the AM peak period with a recorded RFC value of 0.90 on the Slipway Access – A82 (T) (South) turning movement. The resulting queue length of 6 PCUs is not considered to be operationally significant and can be accommodated within the site access, thus not causing a detrimental impact on the operation of the A82 (T). It should be noted that assessment undertaken was a worst-case based on the overly robust assumptions outlined previously regarding ferry traffic rates of 2.1% per annum.

The junction operates within capacity for the 2046 PM peak periods with maximum RFC values typically below the 0.85 threshold. The results suggest that there is no queueing along the A82 (T).

Proposed new A82 (T) / Nether Lochaber slipway junction (Left turn assessment) PICADY Assessment results

Results of the junction capacity assessments are presented in Table 20 below for the weekday assessment and Table 21 for the weekend assessment.

2027 and 2046 Weekday Assessment

Table 20 Summary of Proposed new A82 (T) / Nether Lochaber slipway junction (Left turn assessment) (Weekday Assessment)

Turning Movement	AM Peak		PM Peak	
	Queue (PCU)	RFC	Queue (PCU)	RFC
	2027			
A82 (T) (South) Left-turn lane – Slipway Access	0	0.07	0	0.17
A82 (T) (South) Left-turn lane – Slipway Access	0	0.00	0	0.00
Slipway Access – Slipway Access / A82 (T) (South) Left-turn lane	0	0.00	0	0.00
	2046			
A82 (T) (South) Left-turn lane – Slipway Access	0	0.10	0	0.25
A82 (T) (South) Left-turn lane – Slipway Access	0	0.00	0	0.00
Slipway Access – Slipway Access / A82 (T) (South) Left-turn lane	0	0.00	0	0.00

The results in Table 20 suggest that the left-turn of the proposed junction operates within capacity with maximum RFC values in the 2027 and 2046 AM and PM peak periods below the 0.85 threshold. No queues were recorded during the assessment.

2027 and 2046 Weekend Assessment

Table 21 Summary of Proposed A82 (T) / Upgraded Corran Slipway Junction (Left turn assessment) (Weekend Assessment)

Turning Movement	AM Peak		PM Peak	
	Queue (PCU)	RFC	Queue (PCU)	RFC
	2027			
A82 (T) (South) Left-turn lane – Slipway Access	1	0.32	1	0.38
A82 (T) (South) Left-turn lane – Slipway Access	0	0.00	0	0.00
Slipway Access – Slipway Access / A82 (T) (South) Left-turn lane	0	0.00	0	0.00
	2046			
A82 (T) (South) Left-turn lane – Slipway Access	1	0.48	2	0.56
A82 (T) (South) Left-turn lane – Slipway Access	0	0.00	0	0.00
Slipway Access – Slipway Access / A82 (T) (South) Left-turn lane	0	0.00	0	0.00

The results in Table 21 suggest that the junction operates within capacity with maximum RFC values in the 2027 and 2046 AM and PM peak periods below the 0.85 threshold. The results suggest that the maximum queue length along the A82 (T) is 2 PCU and is recorded in 2046.

Summary of Findings

The junction capacity assessment results suggest that, based on the assumptions used, the proposed junction will operate within capacity and with a maximum queue of 1 PCU during the 2027 weekday and weekend AM and PM peak periods.

For the 2046 junction capacity assessments, the results suggest that the junction will operate within capacity and with a maximum queue of 2 PCUs during the 2046 weekday AM and PM period and the weekend PM period. The junction may operate over the RFC threshold of 0.85 during the weekday AM peak period with a recorded RFC value of 0.90 on the Slipway Access – A82 (T) (South) turning movement. The resulting queue length of 6 PCUs is not considered to be operationally significant and can be accommodated within the site access, thus not causing a detrimental impact on the operation of the A82 (T). The results suggest that the queue length may increase from 1 PCU to 6 PCUs. It should be noted that the design of the proposed junction is sufficient to accommodate these increases.

8.5 Mitigation Measures

While the construction impact assessment results outlined in the previous section did not identify road links where traffic associated with the proposed CFIIS will increase by more than 10%, it is proposed that the following mitigation measures are implemented to manage trips during the construction phase, as per good practice and at the request of THC during the pre-application consultation.

There are no proposed operational mitigation measures, as the proposed CFIIS itself is a betterment to the existing situation which will see the provision of a new junction on the A82(T), a new NEV and increased non-motorised user provisions.

8.5.1 Construction Traffic Management Plan (CTMP)

The following measures would be implemented during the construction phase through the CTMP:

- where possible, the detailed design process would minimise the volume of material to be imported to the application site to help reduce HGV numbers;
- delivery of materials to the Ardgour side of the Narrows via the Ferry will be scheduled to avoid peak times, where practicable. Discussions and agreements regarding this would need to be undertaken between the ferry operator and the contractor;
- normal site delivery hours would be limited to between 0700 and 1900 Monday to Saturday;
- appropriate traffic management measures would be put in place on the A82 (T) and A861 subject to the agreement of TS and THC. Typical measures may include HGV turning and crossing signs and / or banksmen at the site accesses and warning signs;
- a voluntary speed limit of 15mph will be utilised for all construction related vehicles travelling on North Corran.
- all drivers would be required to attend an induction to include:
  - a toolbox talk safety briefing;
  - the need for appropriate care and speed control;
  - a briefing on driver speed reduction agreements for North Corran ; and
  - identification of the required access routes and the controls to ensure no departure from these routes.
- to minimise car movements associated with commuting construction staff the following will be implemented:
  - Staff will be provided relevant public transport information;
  - Car sharing will be encouraged; and
  - Car parking will be provided within the construction compound.

It is noted that a Dust Management Plan (DMP) will be in place which includes mitigation to minimise and manage track out onto the public roads. In addition, a Communication Strategy will be developed and implemented by a community liaison officer, to ensure the public are aware of the planned works and associated traffic.

THC and TS are likely to request that an agreement to cover the cost of abnormal wear on the roads in the vicinity of the proposed CFIIS.

Video footage and /or photographic records of the pre-construction phase condition of the construction vehicles route would be recorded to provide a baseline of the condition of the road prior to any construction work commencing. This baseline would provide evidence of any change in the road condition during the construction phase. Any necessary repairs would be coordinated with THC. Any damage caused by traffic associated with the proposed development during the construction period, which would be hazardous to public traffic, would be repaired immediately.

Damage to road infrastructure caused directly by construction traffic would be remediated, and street furniture that is removed on a temporary basis would be fully reinstated.

9 Summary and Conclusion

Pell Frischmann has been commissioned by Wallace Stone Ltd. to undertake a TA for the CFIIS at Corran Narrows within THC's administrative area.

THC is proposing an upgrade to the Corran Ferry Service that will eventually involve the replacement of the existing diesel powered ferries with electric powered vessels. However, the current proposed works are limited to introduction of a single NEV, with the diesel powered MV Corran retained as the standby vessel. The CFIIS involves the design and development of facilitative infrastructure to support the new electric vessel for the Ferry service, including a new slipway at Ardgour and Nether Lochaber as well as marshalling areas and public facilities at the Nether Lochaber side of the Narrows. The CFIIS will also include the construction of a new berthing pier at the Ardgour side of the Narrows.

This TA has been prepared to review and explain the transport and access issues relating to the CFIIS. This report provides information on the transport planning aspects of the development, providing supplementary information to assist on the determination of a planning application.

Automatic Traffic Count surveys and turning count surveys were undertaken. This data established a base point for determining the impact during the construction and operational phases and were factored to future levels to help determine the effect of traffic associated with the proposed CFIIS on the road network within the study area.

The peak of construction activity is expected to occur in the beginning of Month 9. During the peak construction period of the proposed CFIIS it is estimated that there may be 122 HGV movements per day (61 inbound trips and 61 outbound trips), of which 108 HGV movements per day (54 inbound trips and 54 outbound trips) could be associated with the construction of the Nether Lochaber side of the Narrows and 14 HGVs per day (7 inbound trips and 7 outbound trips) would be associated with the construction of the Ardgour side of the Narrows. In addition to this, a total of 50 Cars / LGVs per day could be associated with staff trips.

It is anticipated that Ferry carryings will continue to grow annually and for the purpose of the operational phase assessment it was assumed that an uplift of 2.1% would occur annually. The results of the capacity review assessment suggest that there is sufficient spare road capacity to accommodate additional flows. It should also be noted that these road links currently experience fluctuations throughout the year as a result of the existing Ferry carryings. A series of mitigation measures and management plans have been proposed to help mitigate and offset the impacts of the construction traffic flows. The effects of construction traffic are temporary in nature and are transitory and no significant traffic effects are predicted.

The design of the CFIIS aims to improve the existing operation of the Ferry service. This includes the provision of an increased marshalling area at the new Nether Lochaber Slipway and improved pedestrian and cyclist facilities. A new access, in the form of a ghost island junction, leading to the new slipway will be constructed to the north of the existing slipway A82 (T) / A861 priority junction. The new junction will include a deceleration lane for left-turning vehicles from the A82 (T) south and a dedicated right-turning lane for vehicles waiting to turn into the junction from the A82 (T) north. The composition of the upgraded junction aims to improve the safety of vehicles travelling through the junction and to remove the bottleneck along the A82(T) caused by vehicles waiting to turn into the slipway access.

Annex A Bus Timetable Information

Network Map

(https://www.google.com/maps/d/edit?mid=1UetsELrRUTAI2v-KuqjHDGD01wNOybpu&usp=sh%E2%80%A6)

Plan a Route

Leaving from...

Arriving at...

Go

Timetable and Fares

Kilchoan - Fort William

Route 506

Kilchoan - Fort William

	M-S
Kilchoan Post Office	07:50
Kilchoan Slipway	07:56 T
Kilmory X Roads	08:06
Ardsliginish	08:17
Ardnamurchan Distillery Entrance	08:23
Laga Bay	08:35
Salen Village Store	08:45
Acharacle Village Shop	08:55
Acharacle Primary School	09:00 SD
Acharacle Village Shop	09:05
Strontian Village Green	09:30
Clovullin Shop	09:47
Ardgour Inn	09:55
(Crosses on 10:00 ferry to Corran)	
Corran Car Park	10:05

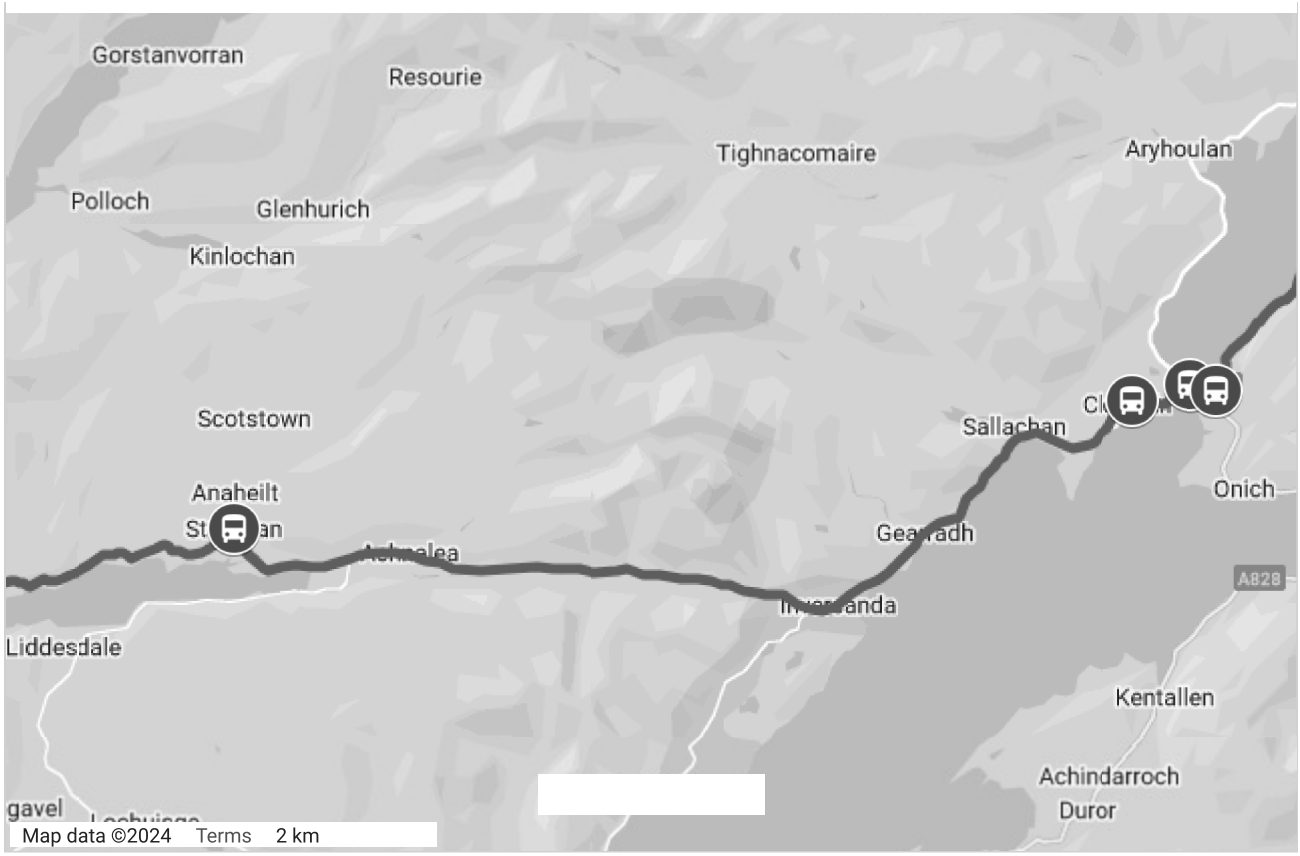
	M-S
Fort William Middle St. Car Park	10:20
Fort William Bus Station	10:22

Fort William - Kilchoan

	SD	S SH
	M-F	M-S
Fort William Bus Station	13:50	13:50
Fort William Middle Street Nevisport	13:52	13:52
Corran Car Park	14:15	14:15
(Crosses on 14:15 ferry to Ardgour)		
Ardgour Inn	14:20	14:20
Clovullin Shop	14:28	14:28
Strontian Village Green	14:45	14:45
Acharacle Village Shop	15:15	15:15
Acharacle Primary School	15:20	----
Salen Village Store	15:30	15:20
Laga Bay	15:42	15:32
Ardnamurchan Distillery (opp entrance)	15:54	15:44
Ardsliginish	16:00	15:50
Kilmory X Roads	16:11RK	16:01RK
Kilchoan Slipway	16:25Rt	16:15Rt
Kilchoan Post Office	16:30	16:20

Table Key

SD	School Days Only
S SH	Saturdays and school holidays only
RK	Diverts to Kilmory on request to set down passengers on board
R	Diverts on request to set down passengers on board.
t	Connects with 16:30 (winter) / 16:45 (summer) ferry to Tobermory
M - S	Monday to Saturday



Adult Fares

Adult Single

Fort William

Fort William
4 Glen Nevis Business Park
Claggan, Fort William
Inverness-shire PH33 6RX
Call. **01397 700700**

SHIEL BUSES
BUSAICHEAN SEILE

Acharacle
Blain Garage
Acharacle
Argyll PH36 4JY
Call. **01967 431272**

Lochaline ❯ Fort William
Route No: 507

Service Number	**507**	**507**	**507**
Days of Operation	**M-F**	**T,Th**	**T,Th**
Lochaline - Fort William	**SD**	**SD**	**SH**
Drimnin Slipway	**----**	----	09:05 **R**
Lochaline Slipway	***08:05***	09:30	09:30
Lochaline Kirk Brae	***08:08***	09:33	09:33
Ardtornish Gardens	**----**	09:38 **D**	09:38 **D**
Claggan	***08:17***	09:42	09:42
Carnoch Bridge	***08:40***	10:05	10:05
Ardnamurchan High School arr	***08:45***	----	----
Inversanda	**----**	10:17	10:17
Ardgour Inn	**----**	10:25	10:25
(Crosses on 10:30 ferry to Corran)			
Corran Car Park	**----**	10:35	10:35
Fort William Middle St. Car Park	**----**	10:50	10:50
Fort William Bus Station	**----**	10:52	10:52

Service Number	**507**	**507**	**507**	**507**	**507**
Days of Operation	**T, Th**	**FO**	**M, W**	**T,Th**	**T,Th**
Fort William - Lochaline	**SD**	**SD**	**SD**	**SD**	**SH**
Fort William Bus Station	----	----	----	14:50	14:50
Fort William Middle Street Nevisport	----	**----**	----	14:52	14:52
Corran Car Park	----	**----**	**----**	15:07	15:07
(Crosses on 15:15 ferry to Ardgour)					
Ardgour Inn	----	**----**	----	15:20	15:20
Inversanda	----	**----**	----	15:27	15:27
Strontian Village Green	----	**----**	----	15:40 **D**	15:40 **D**
Ardnamurchan High School dep	08:45	***13:35***	***15:45***	***15:45***	----
Carnoch Bridge	08:50	***13:40***	***15:50***	***15:50***	15:40
Claggan	09:10	***14:03***	***16:13***	***16:13***	16:03
Ardtornish Gardens	----	***14:07 D***	***16:17 D***	***16:17 D***	16:07 **D**
Lochaline Kirk Brae	----	***14:12***	***16:22***	***16:22***	16:12
Lochaline Slipway	09:20	***14:15***	***16:25***	***16:25***	16:15
Drimnin Slipway	----	**----**	----	----	16:50 **R**

D – Diverts to Strontian and Ardtornish on request to set down or pick-up passengers. Subsequent times may then be up to 8 minutes later than shown.
R – Extension from/to Drimnin operates on request only. To request pick up for this service telephone 01397 700 700 between 0900 and 1200 Monday to Friday.
M,W - Mondays, Wednesdays
T,Th - Tuesdays and Thursdays
FO - Fridays Only
SD - School Days Only
SH - School Holidays Only
School Service

No Service 25th & 26th December or 1st & 2nd January

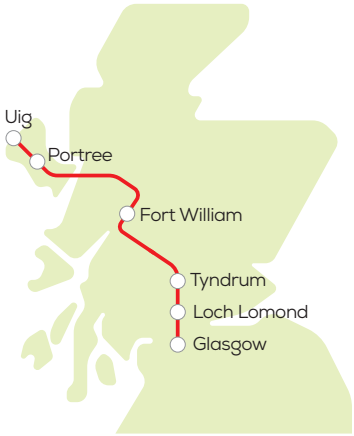
For school term dates please check:
https://www.highland.gov.uk/info/878/schools/32/school_term_dates

Glasgow | Fort William | Portree | Uig

913 914 915 916 977

daily

route number	916	● 914	915	● 977	● 913	● 914	915	914	● 914	● 914	914
Glasgow Buchanan Bus Station	0640	0845	1000	1020		1130	1300	1500	1600	1700	1805
Renfrew Road opp Trident House	↓	↓	1017	1037		↓	1317	↓	↓	↓	↓
✈ **Glasgow Airport**	↓	↓	1022	1042		↓	1322	↓	↓	↓	↓
Hillhead Great Western Rd at Kersland St	0649	0856	↓	↓		1141	↓	1511	1611	1711	1816
Gartnavel Great Western Road	0653	0900	↓	↓		1145	↓	1515	1615	1715	1820
Anniesland Cross	0656	0903	↓	↓		1148	↓	1518	1618	1718	1823
Drumchapel Drumry rbt	0704	0911	↓	↓		1156	↓	1526	1626	1726	1831
Clydebank Great Western Rd at Kilbowie Rd	0706	0913	↓	↓		1158	↓	1528	1628	1728	1833
Dumbarton Barloan Toll	0717	0924	1044	1104		1209	1344	1539	1639	1739	1843
Balloch layby north of Balloch rbt	0723	0930	1050	1110		1215	1350	1545	1645	1745	1849
Luss village on A82 northbound	0734	0941	1101	1121		1226	1401	1556	1656	1756	1900
Inverbeg Hotel	0739	0946	1106	1126		1231	1406	1601	1701	1801	1905
Tarbet A82 at Hotel car park	0746	0953	1113	1133		1238	1413	1608	1708	1808	1912
Sloy Power Station	0754	1001	1121	1141		1246	1421	1616	1716	1816	1920
Ardlui Hotel	0804	1011	1131	1151		1256	1431	1626	1726	1826	1929
Inverarnan village on A82	0808	1015	1135	1155		1300	1435	1630	1730	1830	1933
Crianlarich Hotel	0818	1025	1145	1205		1310	1445	1640	1740	1840	1943
Tyndrum layby at toilet *arr*	0826	1033	1153	1213		1318	1453	1648	1748	1848	1951
Tyndrum layby at toilet *dep*	0826	1038	1158	↳	1218	1323	1458	1653	1753	1853	1955
Bridge of Orchy Hotel	0837	1049	1209		1229	1334	1509	1704	1804	1904	2006
Glencoe Ski Centre White Corries Rd End	0854	1106	1226		1246	1351	1526	1721	1821	1921	2023
Glencoe Visitor Centre	0911	1123	1243		1303	1408	1543	1738	1838	1938	2040
Glencoe crossroads	0913	1125	1245		1305	1410	1545	1740	1840	1940	2042
Ballachulish opp Tourist Office	0915	1127	1247		1307	1412	1547	1742	1842	1942	2044
North Ballachulish A82/B863 junction	0920	1132	1252		1312	1417	1552	1747	1847	1947	2049
Onich opp Village Store	0923	1135	1255		1315	1420	1555	1750	1850	1950	2052
Corran northbound bus bay A82	0927	1139	1259		1319	1424	1559	1754	1854	1954	2056
Croit Anna Hotel on A82	0939	1151	1311		1331	1436	1611	1806	1906	2006	2108
Fort William bus station *arr*	0944	1156	1316		1336	1441	1616	1811	1911	2011	2113
Fort William bus station *dep*	1000		1350				1650				
Portree Square *arr*	1305		1654				1954				
Uig pier	1340		1745								



● 20 May until 29 September 2024

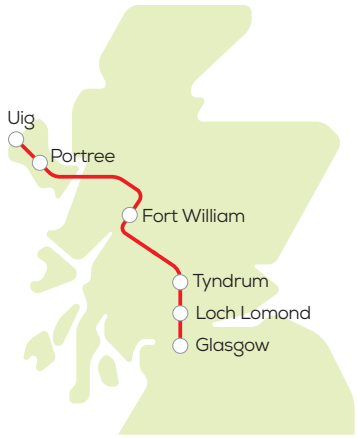
these journeys continue to
Portree & Uig or Portree

Glasgow | Fort William | Portree | Uig

915 916 917

daily — **DS**

route number	915	917	916	● 917	915	● 917	915	917
Glasgow Buchanan Bus Station			0640		1000		1300	
Fort William bus station *arr*			0944		1316		1616	
Fort William bus station *dep*			1000		1350		1650	
Torlundy on A82			1009		1359		1659	
Spean Bridge Spean Crescent			1018		1408		1708	
Stronaba village on A82			1023		1413		1713	
Letterfinlay hotel on A82			1032		1422		1722	
Laggan Locks on A82			1038		1428		1728	
Loch Lochy Youth Hostel			1040		1430		1730	
Invergarry A87 opp Hotel			1044		1434		1734	
Bunloyne Junction		0941	1102	1426	1452	1716	1752	1856
Cluanie Inn		0953	1114	1438	1504	1728	1804	1908
Sheil Bridge opp bus shelter		1012	1133	1457	1523	1747	1823	1927
Inverinate layby near school		1016	1137	1501	1527	1751	1827	1931
Dornie Bridge		1023	1144	1508	1534	1758	1834	1938
Ardelve A87 at North Road end		1025	1146	1510	1536	1800	1836	1940
Kirkton village on A87		1030	1151	1515	1541	1805	1841	1945
Reraig opp Balmacara Hotel		1032	1153	1517	1543	1807	1843	1947
Kyle of Lochalsh Old Slipway *arr*		1038	1159	1523	1549	1813	1849	1953
Kyle of Lochalsh Old Slipway *dep*		1042	1202	1527	1552	1817	1855	1957
Kyleakin Shorefront Shelter		1047	1207	1532	1557	1822	1900	2002
Broadford Armadale Road End		1057	1217	1542	1607	1832	1910	2012
● **Broadford** Post Office		1101	1221	1546	1611	1836	1914	2016
Broadford Hospital		1103	1223	1548	1613	1838	▼	▼
Strollamus village on A87		1110	1230	1555	1620	1845	1920	2022
Dunan village on A87		1111	1231	1556	1621	1846	1921	2023
Ard Dorch village		1112	1232	1557	1622	1847	1922	2024
Luib A87 at Road End		1114	1234	1559	1624	1849	1924	2026
Sconser Ferry Road End *arr*		1124	1244	1609	1634	1859	1934	2036
Sconser Ferry Road End *dep*		1124	1245	1609	1634	1859	1934	2036
Sligachan bus shelter		1129	1250	1614	1639	1904	1939	2042
Portree Square *arr*		1144	1305	1629	1654	1919	1954	2056
Portree Square *dep*	0830	↳	1310	↳	1715			
Kensaleyre village on A87	0843		1323		1728			
Uig pier	0900		1340		1745			



DS daily 22 April - 7 September 2024
otherwise Mondays to Saturdays only

● connections are available at Broadford to and from Armadale - for details of services to and from Armadale, please see Stagecoach in the Highlands timetables or **stagecoachbus.com/timetables**

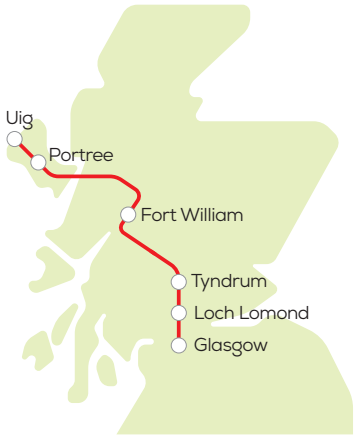
● 20 May until 29 September 2024

Uig | Portree | Fort William | Glasgow

915 916 917

daily

route number	915	917	● 917	915	● 917	916	917	NS 916	S 916
Uig pier				0930		1440		1825	1840
Kensaleyre village on A87				◆0947		1457		1842	1857
Portree Square *arr*				1000		1510		1855	1910
Portree Square *dep*	0730	0900	1030	1035	1300	1540	1745		
Sligachan opp hotel	0745	0915	1045	1050	1315	1555	1800		
Sconser Ferry Road End *arr*	0750	0920	1050	1055	1320	1600	1805		
Sconser Ferry Road End *dep*	0750	0925	1050	1055	1320	1600	1805		
Luib A87 at Road End	0800	0935	1100	1105	1330	1610	1815		
Ard Dorch village on A87	0802	0937	1102	1107	1332	1612	1817		
Dunan village on A87	0803	0938	1103	1108	1333	1613	1818		
Strollamus village on A87	0804	0939	1104	1109	1334	1614	1819		
● **Broadford** Hospital Road End	0810	0945	1110	1115	1340	1620	1825		
Broadford Hospital	0812	0947	1112	1117	1342	1622	1827		
Broadford Armadale Road End	0816	0951	1116	1121	1346	1626	1831		
Kyleakin Shorefront Shelter	0826	1001	1126	1131	1356	1636	1841		
Kyle of Lochalsh Old Slipway *arr*	0831	1006	1131	1136	1401	1641	1846		
Kyle of Lochalsh Old Slipway *dep*	0833	1009	1134	1138	1404	1643	1849		
Reraig A87 outside Balmacara Hotel	0839	1015	1140	1144	1410	1649	1855		
Kirkton village on A87	0841	1017	1142	1146	1412	1651	1857		
Ardelve A87 at North Road End	0846	1022	1147	1151	1417	1656	1902		
Dornie Bridge at Dornie Road End	0848	1024	1149	1153	1419	1658	1904		
Inverinate opp houses	0855	1031	1156	1200	1426	1705	1911		
Sheil Bridge bus shelter	0859	1035	1200	1204	1430	1709	1915		
Cluanie Inn	0918	1054	1219	1223	1449	1728	1934		
Bunloyne Junction	0930	1106	1231	1235	1501	1740	1946		
Invergarry at hotel on A87	0948			1253		1758			
Loch Lochy Youth Hostel	0952			1257		1802			
Laggan Locks on A82	0954			1259		1804			
Letterfinlay hotel on A82	1000			1305		1810			
Stronaba village on A82	1009			1314		1819			
Spean Bridge Spean Crescent	1014			1319		1824			
Torlundy on A82	1023			1328		1833			
Fort William bus station *arr*	1035			1340		1842			
Fort William bus station *dep*	1110			1410		1910			
Glasgow Buchanan Bus Station	1427			1730		2216			



◆ this part of the journey runs daily 22 April - 7 September 2024 otherwise Mondays - Saturdays

NS journey does not run on Saturdays

S journey runs on Saturdays only

● connections are available at Broadford to and from Armadale - for details of services to and from Armadale, please see Stagecoach in the Highlands timetables or **stagecoachbus.com/timetables**

● 20 May until 29 September 2024

Uig | Portree | Fort William | Glasgow

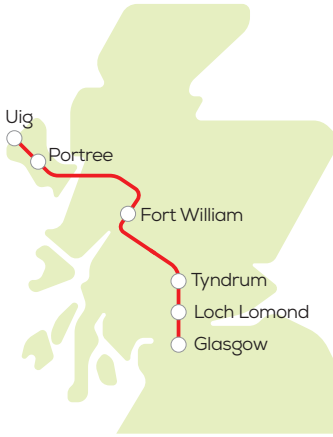
913 914 915 916 977

daily

route number	914	914	● 914	915	● 914	● 915	● 914	● 913	● 977	● 914	916
Uig pier						0930					1440
Portree Square				0730		1035					1540
Fort William bus station *arr*				1035		1340					1842
Fort William bus station *dep*	0710	0910	1010	1110	1310	1410	1510	1600		1740	1910
Croit Anna hotel on A82	0715	0915	1015	1115	1315	1415	1515	1605		1745	1915
Corran southbound bus bay on A82	0727	0927	1027	1127	1327	1427	1527	1617		1757	1927
Onich Village Store	0731	0931	1031	1131	1331	1431	1531	1621		1801	1931
North Ballachulish opp A82/B863	0734	0934	1034	1134	1334	1434	1534	1624		1804	1934
Ballachulish Tourist Office	0739	0939	1039	1139	1339	1439	1539	1629		1809	1939
Glencoe crossroads	0742	0942	1042	1142	1342	1442	1542	1632		1812	1942
Glencoe Visitor Centre	0744	0944	1044	1144	1344	1444	1544	1634		1814	1944
Glencoe Ski Centre White Corries Rd End	0801	1001	1101	1201	1401	1501	1601	1651		1831	2001
Bridge of Orchy opp hotel	0818	1018	1118	1218	1418	1518	1618	1708		1848	2018
Tyndrum opp Pine Trees Leisure Park *arr*	0829	1029	1129	1229	1429	1529	1629	1719		1859	2029
Tyndrum opp Pine Trees Leisure Park *dep*	0829	1029	1129	1229	1429	1529	1629	↳	1724	1859	2029
Crianlarich layby near toilets *arr*	0837	1037	1137	1237	1437	1537	1637		1732	1907	2037
Crianlarich layby near toilets *dep*	0842	1042	1142	1242	1442	1542	1642		1732	1912	2042
Inverarnan village on A82	0852	1052	1152	1252	1452	1552	1652		1742	1922	2052
Ardlui Hotel	0856	1056	1156	1256	1456	1556	1656		1746	1926	2056
Sloy Power Station	0905	1105	1205	1305	1505	1605	1705		1755	1935	2105
Tarbet opp Hotel on A82	0913	1113	1213	1313	1513	1613	1713		1803	1943	2113
Inverbeg opp hotel on A82	0920	1120	1220	1320	1520	1620	1720		1810	1950	2120
Luss Village A82 southbound	0925	1125	1225	1325	1525	1625	1725		1815	1955	2125
Balloch layby north of roundabout	0936	1136	1236	1336	1536	1636	1736		1826	2006	2136
Dumbarton Barloan Toll	0943	1143	1243	1343	1543	1643	1743		1833	2013	2143
Clydebank Gt Western Road at Kilbowie Road	0953	1153	1253	↓	1553	↓	1753		↓	2023	2153
Drumchapel Drumry rbt	0955	1155	1255	↓	1555	↓	1755		↓	2025	2155
Anniesland Cross	1003	1203	1303	↓	1603	↓	1803		↓	2033	2202
Gartnavel Gt Western Road bus stop	1006	1206	1306	↓	1606	↓	1806		↓	2036	2205
Hillhead Great Western Rd at Hamilton Park Ave	1010	1210	1310	↓	1610	↓	1810		↓	2040	2208
Glasgow Airport	↓	↓	↓	1404	↓	1704	↓		1854	↓	↓
Renfrew Road at Trident House	↓	↓	↓	1409	↓	1709	↓		1859	↓	↓
Glasgow Buchanan Bus Station	1021	1221	1321	1427	1621	1730	1821		1917	2051	2216

these journeys start from Uig or Portree and stop at all places listed to Glasgow

● 0930 journey starts from Portree at 1035 on Sundays until 21 April (inclusive) and from 8 September 2024



● 20 May until 29 September 2024 only

Fort William
4 Glen Nevis Business Park
Claggan, Fort William
Inverness-shire PH33 6RX
Call. **01397 700700**

SHIEL BUSES
BUSAICHEAN SEILE

Acharacle
Blain Garage
Acharacle
Argyll PH36 4JY
Call. **01397 700700**

COMMENCING 20TH AUGUST 2024

Fort William ❯ Kinlochleven | Service - 44, 144

Fort William - Kinlochleven	**44**	**144**	**44**	**44**	**44**	**44**	**44**	**44**	**44**
Monday - Friday	**M-F**	**M-F**	**M-F**	**M-F**	**M-Th**	**FO**	**M-F**	**M-F**	**M-F**
School Days Only	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
Fort William Bus Station	----	***-----***	----	10:30	12:30	12:30	14:30	17:30	21:00
Fort William Middle Street Nevisport	06:30	***07:05***	07:50	10:32	12:32	12:32	14:32	17:32	21:02
Corran Ferry Bus Stop	06:45	***07:20***	08:05	10:45	12:45	12:45	14:45	17:45	21:15
Onich Post Office	06:50	***07:25***	08:10	10:50	12:50	12:50	14:50	17:50	21:20
Ballachulish Square	07:00	***07:35***	08:20	11:00	13:00	13:00	15:00	18:00	21:30
Kentallen Old Station	----	***07:45***	----	----	----	----	----	----	----
Duror Dalnatrat Road End	----	***07:55***	----	----	----	----	----	----	----
Kentallen Old Station	----	***08:05***	----	----	----	----	----	----	----
Ballachulish Square	----	***08:15***	----	----	----	----	----	----	----
Glencoe Junction	07:05	***08:20***	08:25	11:05	13:05	13:05	15:05	18:05	21:35
Kinlochleven Leven Road	07:17	***08:32***	08:37	11:17	13:17	13:17	15:17	18:17	21:47
Kinlochleven Heather Lea	07:20	***----***	----	11:20	13:20	13:20	15:20	18:20	21:50
Kinlochleven High School	----	***08:35***	08:40	----	----	13:30	15:30	----	----

Kinlochleven - Fort William	**44**	**44**	**44**	**44**	**144**	**44**	**44**	**144**	**44**	**44**	**44**
Monday - Friday	**M-F**	**M-F**	**M-F**	**M-Th**	**FO**	**FO**	**M-TH**	**M-Th**	**FO**	**M-F**	**M-F**
School Days Only	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
Kinlochleven High School	----	----	----	----	***13:30***	13:35	15:50	***15:50***	----	----	----
Kinlochleven Heather Lea	07:30	09:00	11:30	13:30	***----***	----	----	***----***	15:50	18:30	22:00
Kinlochleven Leven Road	07:33	09:03	11:33	13:33	***----***	13:38	15:53	***----***	15:53	18:33	22:03
Glencoe Junction	07:45	09:15	11:45	13:45	***13:45***	13:50	16:05	***16:05***	16:05	18:45	22:15
Ballachulish Square	07:50	09:20	11:50	13:50	***13:50***	13:55	16:10	***16:10***	16:10	18:50	22:20
Kentallen Old Station	----	----	----	----	***14:00***	----	----	***16:20***	----	----	----
Duror Dalnatrat Road	----	----	----	----	***14:10***	----	----	***16:30***	----	----	----
Kentallen Old Station	----	----	----	----	***14:20***	----	----	***16:40***	----	----	----
Ballachulish Square	----	----	----	----	***14:30***	----	----	***16:50***	----	----	----
Onich Post Office	08:00	09:30	12:00	14:00	***14:40***	14:05	16:20	***17:00***	16:20	19:00	22:30
Corran Ferry Bus Stop	08:05	09:35	12:05	14:05	***14:45***	14:10	16:25	***17:05***	16:25	19:05	22:35
Fort William Middle Street Car Park	08:20	09:50	12:20	14:20	***15:00***	14:25	16:40	***17:20***	16:40	19:20	22:50
Fort William Bus Station	08:25	09:55	12:25	14:25	***15:02***	14:27	16:45	***----***	16:45	19:25	22:55

Fort William - Kinlochleven	**44**	**44**	**44**	**44**	**44**	**44**	**44**
Monday to Friday	**M-F**	**M-F**	**M-F**	**M-F**	**M-F**	**M-F**	**M-F**
School Holidays	**SH**	**SH**	**SH**	**SH**	**SH**	**SH**	**SH**
Fort William Bus Station	----	08:30	10:30	12:30	14:30	17:30	21:00
Fort William Middle Street Nevisport	06:30	08:32	10:32	12:32	14:32	17:32	21:02
Corran Ferry Bus Stop	06:45	08:45	10:45	12:45	14:45	17:45	21:15
Onich Post Office	06:50	08:50	10:50	12:50	14:50	17:50	21:20
Ballachulish Square	07:00	09:00	11:00	13:00	15:00	18:00	21:30
Glencoe Junction	07:05	09:05	11:05	13:05	15:05	18:05	21:35
Kinlochleven Leven Road	07:17	09:17	11:17	13:17	15:17	18:17	21:47
Kinlochleven Heather Lea	07:20	09:20	11:20	13:20	15:20	18:20	21:50

Kinlochleven - Fort William	**44**	**44**	**44**	**44**	**44**	**44**	**44**
Monday to Friday	**M-F**	**M-F**	**M-F**	**M-F**	**M-F**	**M-F**	**M-F**
School Holidays	**SH**	**SH**	**SH**	**SH**	**SH**	**SH**	**SH**
Kinlochleven Heather Lea	07:30	09:30	11:30	13:30	15:30	18:30	22:00
Kinlochleven Leven Road	07:33	09:33	11:33	13:33	15:33	18:33	22:03
Glencoe Junction	07:45	09:45	11:45	13:45	15:45	18:45	22:15
Ballachulish Square	07:50	09:50	11:50	13:50	15:50	18:50	22:20
Onich Post Office	08:00	10:00	12:00	14:00	16:00	19:00	22:30
Corran Ferry Bus Stop	08:05	10:05	12:05	14:05	16:05	19:05	22:35
Fort William Middle Street Car Park	08:20	10:20	12:20	14:20	16:20	19:20	22:50
Fort William Bus Station	08:25	10:25	12:25	14:25	16:25	19:25	22:55

M-Th - Monday to Thursday
M-F - Monday to Friday
FO - Fridays Only
SD - School Days
SH - School Holidays

School Service

No service 25th & 26th
December & 1st and 2nd January

44 - Dog friendly
144 - Unable to carry dogs
(other than registered assistance dogs).
Unable to carry bicycles

Fort William
4 Glen Nevis Business Park
Claggan, Fort William
Inverness-shire PH33 6RX
Call. **01397 700700**

SHIEL BUSES
BUSAICHEAN SEILE

Acharacle
Blain Garage
Acharacle
Argyll PH36 4JY
Call. **01397 700700**

COMMENCING 20TH AUGUST 2024

Fort William › Kinlochleven

Service - 44 *Saturday & Sunday*

Fort William - Kinlochleven	**44**	**44**	**44**	**44**	**44**	**44**	**44**
Saturday	**Sat**	**Sat**	**Sat**	**Sat**	**Sat**	**Sat**	**Sat**
Fort William Bus Station	----	08:30	10:30	12:30	14:30	17:30	21:00
Fort William Middle Street Nevisport	06:30	08:32	10:32	12:32	14:32	17:32	21:02
Corran Ferry Road End	06:45	08:45	10:45	12:45	14:45	17:45	21:15
Onich Post Office	06:50	08:50	10:50	12:50	14:50	17:50	21:20
Ballachulish Square	07:00	09:00	11:00	13:00	15:00	18:00	21:30
Glencoe Junction	07:05	09:05	11:05	13:05	15:05	18:05	21:35
Kinlochleven Leven Road	07:17	09:17	11:17	13:17	15:17	18:17	21:47
Kinlochleven Heather Lea	07:20	09:20	11:20	13:20	15:20	18:20	21:50

Kinlochleven - Fort William	**44**	**44**	**44**	**44**	**44**	**44**	**44**
Saturday	**Sat**	**Sat**	**Sat**	**Sat**	**Sat**	**Sat**	**Sat**
Kinlochleven Heather Lea	07:30	09:30	11:30	13:30	15:30	18:30	22:00
Kinlochleven Leven Road	07:33	09:33	11:33	13:33	15:33	18:33	22:03
Glencoe Junction	07:45	09:45	11:45	13:45	15:45	18:45	22:15
Ballachulish Square	07:50	09:50	11:50	13:50	15:50	18:50	22:20
Onich Post Office	08:00	10:00	12:00	14:00	16:00	19:00	22:30
Corran Ferry Road End	08:05	10:05	12:05	14:05	16:05	19:05	22:35
Fort William Middle Street Car Park	08:20	10:20	12:20	14:20	16:20	19:20	22:50
Fort William Bus Station	08:25	10:25	12:25	14:25	16:25	19:25	22:55

Fort William - Kinlochleven	**44**	**44**	**44**	**44**
Sunday	**Sun**	**Sun**	**Sun**	**Sun**
Fort William Bus Station	09:30	11:30	14:30	16:30
Fort William Middle Street Nevisport	09:32	11:32	14:32	16:32
Corran Ferry Road End	09:45	11:45	14:45	16:45
Onich Post Office	09:50	11:50	14:50	16:50
Ballachulish Square	10:00	12:00	15:00	17:00
Glencoe Junction	10:05	12:05	15:05	17:05
Kinlochleven Leven Road	10:17	12:17	15:17	17:17
Kinlochleven Heather Lea	10:20	12:20	15:20	17:20

Kinlochleven - Fort William	**44**	**44**	**44**	**44**
Sunday	**Sun**	**Sun**	**Sun**	**Sun**
Kinlochleven Heather Lea	10:30	12:30	15:30	17:30
Kinlochleven Leven Road	10:33	12:33	15:33	17:33
Glencoe Junction	10:45	12:45	15:45	17:45
Ballachulish Square	10:50	12:50	15:50	17:50
Onich Post Office	11:00	13:00	16:00	18:00
Corran Ferry Road End	11:05	13:05	16:05	18:05
Fort William Middle Street Car Park	11:20	13:20	16:20	18:20
Fort William Bus Station	11:25	13:25	16:25	18:25

Sat - Saturdays
Sun - Sundays

No service 25th & 26th
December & 1st and 2nd January

44 - Dog friendly
144 - Unable to carry dogs (other than registered assistance dogs).
Unable to carry bicycles

Fort William
4 Glen Nevis Business Park
Claggan, Fort William
Inverness-shire PH33 6RX
Call. **01397 700700**

SHIEL BUSES
BUSAICHEAN SEILE

Acharacle
Blain Garage
Acharacle
Argyll PH36 4JY
Call. **01967 431272**

Ballachulish › LHS › Bun Sgoil Lochaber
Route No: 512B

Service Number	512B
Days of Operation	M-F
School Days Only	SD
Kinlochleven Road End (Bail-Ur)	08:05
Alt nan Ros Hotel	08:08
Onich Post Office	08:10
Cuilcheanna Road End	08:12
Inchree	08:13
Bunree	08:14
Corran Ferry	08:15
Drumarbin	08:22
Croit Anna Hotel	08:23
Achintore Road	08:24
Seafield Gardens	08:25
Lochaber High School	08:40
Bun Sgoil Lochaber	08:45

Service Number	512B	512B	512B
Days of Operation	M-Th	FO	FO
School Days Only	SD	SD	SD
Bun Sgoil Lochaber	15:25	----	15:25
Lochaber High School	15:45	13:35	----
Fort William Middle Street Nevisport	15:53	13:43	15:35
Seafield Gardens	16:00	13:50	15:42
Achintore Road	16:01	13:51	15:43
Croit Anna Hotel	16:02	13:52	15:44
Corran Ferry	16:10	14:00	15:52
Inchree	16:12	14:02	15:54
Cuilcheanna Road End	16:13	14:03	15:55
Onich Post Office	16:15	14:05	15:57
Kinlochleven Road End (Bail-Ur)	16:25	14:15	16:07

FO - Fridays Only
M-F - Monday to Friday
M-Th - Monday to Thursday
SD - School Days Only
School Service

No service on 25th & 26th December and 1st and 2nd January each year.

For school term dates please check:
https://www.highland.gov.uk/info/878/schools/32/school_term_dates

Fort William
4 Glen Nevis Business Park
Claggan, Fort William
Inverness-shire PH33 6RX
Call. **01397 700700**

SHIEL BUSES
BUSAICHEAN SEILE

Acharacle
Blain Garage
Acharacle
Argyll PH36 4JY
Call. **01967 431272**

Treslaig › Ardnamurchan High School
Route No: 528

Service Number	**528**
Days of Operation	**M-F**
School Days Only	**SD**
Camusnagaul Pier	**07:50**
Treslaig	**07:51**
Stronchreggan	**07:55**
Inverscaddle	**08:07**
Ardgour	**08:15**
Clovullin	**08:20**
Strontian	**08:42**
Ardnamurchan High School	**08:45**

Service Number	**528**	**528**
Days of Operation	**M-Th**	**FO**
School Days Only	**SD**	**SD**
Ardnamurchan High School	**15:45**	**13:35**
Strontian	**15:46**	**13:36**
Clovullin	**16:08**	**13:58**
Ardgour	**16:10**	**14:00**
Inverscaddle	**16:20**	**14:10**
Stronchreggan	**16:32**	**14:22**
Treslaig	**16:37**	**14:27**
Camusnagaul Pier	**16:38**	**14:28**

M-F - Monday to Friday
M-Th - Monday - Thursday
FO - Friday Only
SD - School Days Only
School Service

No service on 25th & 26th December and 1st and 2nd January each year.

For school term dates please check:
https://www.highland.gov.uk/info/878/schools/32/school_term_dates

Annex B Ferry Timetable Information

Corran Ferry Timetable

Effective from 29th July 2024

Departure point location postcodes: Corran PH33 6SE, Ardgour PH33 7AA.

The Corran Ferry does not operate on 25 and 26 December, 1 and 2 January.

MONDAY – SATURDAY		SUNDAY	
DEPART CORRAN	**DEPART ARDGOUR**	**DEPART CORRAN**	**DEPART ARDGOUR**
06.30	06.40	08.45	08.30
06.50	07.00	**30 min intervals**	
20 min intervals		20.45	21.00
08.50	08.40	21.10	21.20
09.15	09.00	21.30	
30 min intervals	09.30		
20.45	**30 min intervals**		
21.10	21.00		
21.30	21.20		

Lorry Restrictions

Vessel	Weight	Height	Length
Maid of Glencoul	38 tonnes	16ft-0 (4.8m)	Rigid – 39ft-6 (12m) overall Artic – 49ft (15m) overall
MV Corran	44 tonnes	17ft-6 (5.5m)	Rigid – no restriction Artic – 57ft-0 (17m)

Corran Ferry Fares

Private or Light goods vehicles

Vehicle	Cost
Car, goods vehicle up to 3.5 tonne Gross Vehicle Weight, Land Rover	£11.00
Registered disabled driver	FREE
Pedal cycle	FREE
Motorcycle	£5.00
Motorcycle and side car	£11.00
Trailer	£11.00
Campervan or caravanette less than 6m in length, minibus up to 16 seats	£15.00
Motorhome 6-8m in length	£18.00
Motorhome over 8m in length	£24.00
Caravan	£15.00
Book of 30 tickets, valid for one year Car, small van, campervan less than 6m, minibus up to 16 seats	£80.30
Lochaber pensioner concession - book of 20 tickets, valid for 2 years	£53.80

Vehicles over 3.5 tonne Gross Vehicle Weight

Including VAT where applicable

Vehicle	Cost
Van or lorry under 7.5 tonne Gross Vehicle Weight Tractor or excavator, HGV drawbar trailer	£15.00
HGV 2 axle or large van - both over 7.5 tonne Gross Vehicle Weight	£22.00
HGV 3 axle	£28.40
HGV 4 axle	£35.30
HGV 5 or 6 axle	£52.00
Bus or coach (17-35 seats) – VAT zero rated	£19.20
Bus or coach (36 seats and over) – VAT zero rated	£29.20
Other vehicles or loads ferried by arrangement (fare on application - contact Ferry Office)	

Book of 30 tickets for vehicles over 3.5 tonne Gross Vehicle Weight

Valid for 1 year - business name or motorhome registration required.

Book type	Cost
Book of 30 tickets, valid for 1 year Issued in business name or motorhome registration	£192.20 Including VAT
Book of 30 tickets, valid for 1 year Issued in business name (Buses or coaches)	£160.10 Excluding VAT

Number of tickets required

Vehicle	Number of tickets
Lorry or van under 7.5 tonne, motorhome 6-8m	2 tickets
Tractor, excavator, drawbar trailer	2 tickets
HGV 2 Axle or large van over 7.5 tonne, motorhome over 8m in length	3 tickets
HGV 3 Axle	4 tickets
HGV 4 Axle	5 tickets
HGV 5 or 6 Axle	7 tickets
Bus or coach - 17-35 seats	3 tickets
Bus or coach - 36 seats and over	5 tickets
Payment by debit or credit card is accepted on board	

Pell Frischmann

Annex C Stage 1 Road Safety Audit Report for Corran Ferry Infrastructure Improvements

Wyllie:Lodge
ROAD SAFETY CONSULTANTS

STAGE 1 ROAD SAFETY AUDIT REPORT FOR CORRAN FERRY INFRASTRUCTURE IMPROVEMENTS, NETHER LOCHABER AND ARDGOUR.

Report Ref 138723 (1)

Issue Date 1-Jun-23

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Issue / Revision	Issue 1	Revision A	Revision B	Revision C
Report Title	Stage 1 Road Safety Audit Report For Corran Ferry Infrastructure Improvements, Nether Lochaber and Ardgour.			
Document Ref	138723 (1)			
Document Status/Remarks	Final			
Prepared by	Wyllie Lodge Ltd, Road Safety Consultants.			
Prepared for	The Highland Council (Overseeing Organisation).			
Report Author	D. Lodge			
Signature	[Redacted]			
Checked by	B. Wyllie			
Signature	[Redacted]			
Issued by	D. Lodge			
Signature	[Redacted]			
Date Issued	02/06/23			

1. INTRODUCTION.

1.1. The objective of a Road Safety Audit (RSA) is to identify any aspects of a road design or construction scheme that could give rise to road safety concerns and, where possible, to suggest modifications that would improve the road safety of the resultant scheme. This report results from a Stage 1 RSA carried out on the proposed Corran Ferry infrastructure improvements located at Nether Lochaber and Ardgour, Loch Linnhe, West Highlands. The audit was instructed by Wallace Stone Consulting Civil Engineers and was carried out by Wyllie Lodge Ltd, Independent Road Safety Consultants.

1.2. The Audit Team members were;

Audit Team Leader	David Lodge, BSc, MSc, CMILT, MCIHT, MSoRSA.
Audit Team Member	Blair Wyllie, I Eng, MCIHT, MSoRSA.

Both audit team members hold the Transport Scotland / Highways Agency Certificate of Competence in Road Safety Auditing.

2. PROJECT DETAILS.

2.1. The project consists of the construction of new infrastructure including vehicle waiting areas and new slipways to support the introduction of new electric ferry vessels on the Corran Ferry crossing across Loch Linnhe, replacing the exiting ferry vessels. The service when fully operational transports approximately 250,000 vehicles and more than 500,000 passengers a year

2.2. The new infrastructure will include the following:

- Slipways.
- Alignment structures.
- Overnight berthing.
- Operator / public building works.
- Marshalling areas.
- Car parking.
- Road junctions onto the A82 Trunk Road and A861.

Nether Lochaber (East side of Loch Linnhe).

2.3. The speed limits on the A82 between Fort William and Onich is 50mph.

2.4. The Annual Average Daily total (AADT) traffic flow on the A82 is 6662 (2021 figures).

2.5. The proposed access to the new slipway at Nether Lochaber is to be located on the west side of the A82 approximately 310m north of the existing junction. The access is to be a priority junction with a ghost right turn island for southbound traffic. Merge and diverge slip lanes are to be provided for northbound traffic in accordance with CD 123.

2.6. The access road from the A82 to the slipway will be two lanes wide with an option for an additional third exit lane to split the exiting traffic into those heading northbound and southbound.

2.7. It is proposed to have a 25 space car park and a 5 lane marshalling area.

2.8. A shared use foot/cycleway is to be provided between the existing footway at the existing access and the proposed slipway.

Ardgour (West side of Loch Linnhe).

2.9. The speed limit on the A861 through the village of Ardgour is 30mph.

2.10. The Annual Average Daily total (AADT) traffic flow on the A861 is 734 (2007 figures).

2.11. The slipway at Ardgour is to be relocated approximately 30m north of its existing location and will be perpendicular to the A861.

2.12. A new 6 lane marshalling area is to be constructed on the east side of the sea wall adjacent to the A861.

2.13. Access to the marshalling area will be via a widening of the existing simple priority junction into the existing marshalling area.

2.14. Exit from the slipway will be taken directly onto the A861 as a simple priority junction.

Plans of the proposals are shown in appendix A.

2.15. The information made available for the audit is listed below;

Drawing Ref.	Title
2387 910 Rev A	Proposed Site Location Plan – Nether Lochaber.
2387 911 Rev B	Nether Lochaber Proposed Site Layout Option A.
2387 912 Rev B	Nether Lochaber Proposed Site Layout Option B.
2387 913 Rev B	Nether Lochaber Proposed Site Layout Option C.
2387 914 Rev B	Nether Lochaber Proposed Site Layout Option D.
2387 915 Rev B	Nether Lochaber Proposed Site Layout Option E.
2387 920 Rev B	Proposed Site Location Plan – Ardgour.
2387 921 Rev B	Ardgour Proposed Site Layout Option A.
2387 922	Ardgour Proposed site Layout Option B.

2387 923	Ardgour Proposed Site Layout Option C,
2387 924	Ardgour Proposed Site Layout Option D.
2387 925 Rev B	Proposed Overnight Berthing Structure Options Sheet 1.
2387 926 Rev B	Proposed Overnight Berthing Structure Options Sheet 2.
2387 927	Proposed Overnight Berthing Structure Options Sheet 3.
2387 928 Rev A	Indicative Section Through Overnight Berth.
2387 931 Rev B	Nether Lochaber Slipway Details.
2387 936 Rev B	Ardgour Slipway Details.
2387 938	Preferred Site Layout.
2387-SK-026	2387-SK-Option D - Junction Visibility Splay – v01.
2387-SK-028	2387-SK-Option E – Proposed Junction Visibility Splay – v02
2387-SK-029	2387-SK-Option E – Stopping Sight Distance – Northbound Lane – v02.
2387-SK-030	2387-SK-Option E – Stopping Sight Distance – Southbound Lane – v02.
2387-SK-031	Option E – Road Junction GA 230208.
2387-SK-032	Option E – Marshalling and Approach 230208.
2387-SK-033	Option E – Road Junction – Road Markings & Signs 230208.
2387-SK-034	Option E – Road Junction – Directional signs 230208.
2387-SK-035	Option E – Road Junction with Extra Exit Lane.
2387-SK-057	Ardgour Existing Junction – Visibility Splay v00 230227.
2387-SK-058	Ardgour Existing Junction – Stopping Sight Distance Check – North Bound v00 230227.
2387-SK-059	Ardgour Existing Junction Stopping Sight distance Check 0 South Bound v00 230227.
2387-SK-060	Ardgour Option A – Junction Visibility Splay 230227.
2387-SK-061	Ardgour Option A – Stopping Sight Distance Check – North Bound v00 230227.
2387-SK-062	Ardgour Option A – Stopping Sight Distance Check – South Bound v00 230227.
2387-SK-065 (Sheet 1)	Development Nether Lochaber.
2387-SK-065 (Sheet 2)	Development Nether Lochaber.
2387-SK-065 (Sheet 3)	Development Nether Lochaber.

2387-SK-065 (Sheet 4)	Development Nether Lochaber.
2387-SK-065 (Sheet 5)	Development Nether Lochaber.
2387-SK-065 (Sheet 6)	Development Nether Lochaber.
2387-WS-XX-00-D-C-1001 Rev T01	Proposed General Layout.
2387-WS-XX-00-D-C-1002 Rev T01	Ardgour General Layout.
2387-WS-XX-00-D-C-1003 Rev T01	Nether Lochaber General Layout.
Document Ref.	**Title**
2387-WS-XX-00-T-C-0019	Road Safety Audit Brief.
2387-Doc-005 v02	Options Review Report.
2387-Doc-007 v02	Marshalling Area Capacity Review.
2387-Doc-015	Corran Ferry (Nether Lochaber) Junction Options Review.
50000230 Loch	Traffic Count Data.
	A82 Personal Injury Accident Data.
	Collision Plot Corran Ferry Area.
	Collision Plot Corran Ferry Wider Area.
	Corran Ferry – Key Issues – Video Analysis.

2.16. Road traffic collision information has also been retrieved from Crashmap.co.uk . See appendix B.

3. PROCEDURE.

3.1. The audit was carried out following the general principles and procedures set out in GG 119 of the Design Manual for Roads and Bridges (DMRB), with adaptions to meet the requirements of the local road authority (Overseeing Organisation). The Road Safety Audit procedure is not an examination or verification of compliance to a design standard. Any notified departures from the design standard have been referenced within the report. The recommendations in this report are considered by the audit team to be appropriate and proportionate to the concerns and problems identified.

3.2. The audit was carried out between 17th May and 2nd June 2023 at the offices of Wyllie Lodge and on site. A daytime site visit was carried out between 12:45 and 13:45 hours by both audit team members on Tuesday, 23 May 2023.

3.3. During the site visit traffic flows were very light and flowed without interruption. The vehicle ferry service was not operating and only a pedestrian service was available. The weather was mild and cloudy and the road surface was dry.

3.4. In accordance with GG 119, the Overseeing Organisation should consider the recommendations contained within this audit. In doing so, the Overseeing Organisation shall consult with the Design Team. The design team shall prepare a road safety audit response report that has been agreed with the Overseeing Organisation and signed by both parties indicating their agreement on the RSA actions.

3.5. For the purposes of this audit the following are defined as:

Organisation	Contact
Overseeing Organisations	The Highland Council & Transport Scotland.
3rd Party Organisation /Project Promoter	The Highland Council.
Design Organisation	Wallace Stone Consulting civil Engineers.
Road Safety Audit Organisation	Wyllie Lodge Limited.

4. PREVIOUS ROAD SAFETY AUDITS.

4.1. No previous road safety audit has been carried out for these proposals.

5. IDENTIFIED PROBLEMS

Local Alignment.[1]

No local alignment road safety problems have been identified.

General.

No general road safety problems have been identified.

Junctions.

No junction road safety problems have been identified.

Walking, Cycling and Horse Riding.

No walking, cycling and horse riding road safety problems have been identified.

Traffic Signs, Carriageway Markings and Lighting.

5.1	PROBLEM	
	Location	A82 - Nether Lochaber.
	Summary	Risk of head on or side swipe vehicle collisions.
	This section of the A82 provides an overtaking opportunity for both north and southbound vehicles. However vehicles using the right turn ghost island may be struck by an overtaking vehicle is either direction.	
	Recommendation	
	It is recommended that a solid white line is provided on both approaches to the right turn ghost island lane to prevent overtaking.	

[1] DMRB GG-119 standard list

5.2	PROBLEM	
	Location	A82 – Nether Lochaber.
	Summary	Risk of rear shunt type collisions.

The relocation of the access to the ferry may cause confusion to some drivers particularly as the existing access road is to be kept open to provide access to the residential properties. Confused drivers may brake suddenly if they are unsure of the relocated ferry access junction. This may result in rear shunt type vehicle collisions.

Recommendation

It is recommended that direction signing for the new ferry access clearly indicates where the new access is located including distance sub-plates where necessary. The location of direction sign 1 being very close to the existing ferry access may contribute to driver confusion and late braking.

6. AUDIT TEAM STATEMENT

AUDIT TEAM STATEMENT

CORRAN FERRY INFRASTRUCTURE IMPROVEMENTS

ROAD SAFETY AUDIT STAGE 1

We certify that we have examined the works listed in this report. The examination has been carried out with the sole purpose of identifying any features of design or construction that can be modified in order to improve the safety of the scheme. The problems identified have been noted in this report together with recommendations, which should be studied for implementation.

We certify that this Road Safety Audit has been carried out in accordance with GG 119.

[Redacted]

Signed Audit Team Leader Date 2 June 2023.

David Lodge, BSc, MSc, CMILT, MCIHT, MSoRSA.

[Redacted]

Signed.. Audit Team Member Date 2 June 2023.

Blair Wyllie, I Eng, MCIHT, MSoRSA.

Wyllie Lodge Road Safety Consultants		T 08450 944512
Blair Wyllie	Blair@wyllielodge.co.uk	M 07952269914
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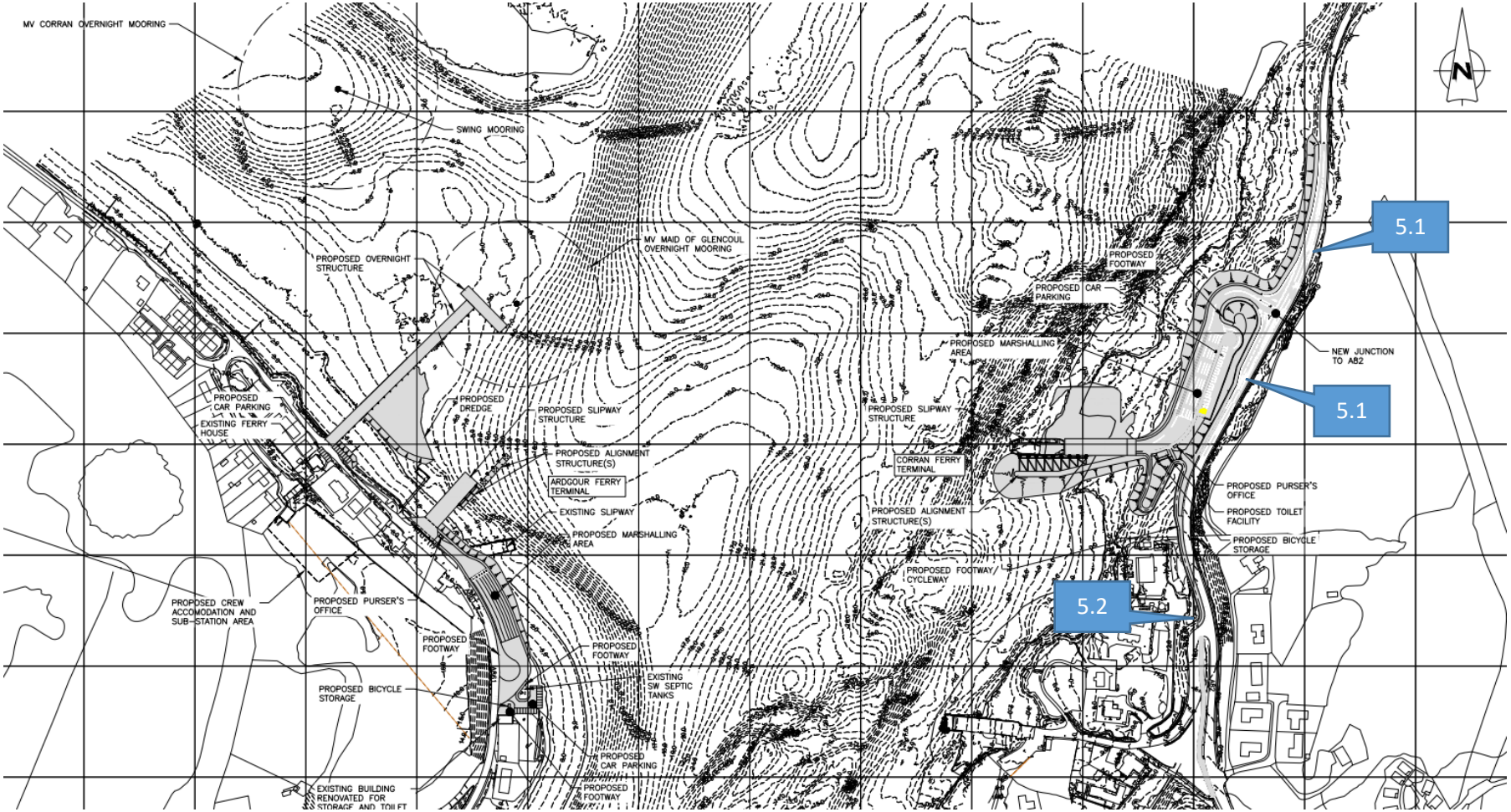
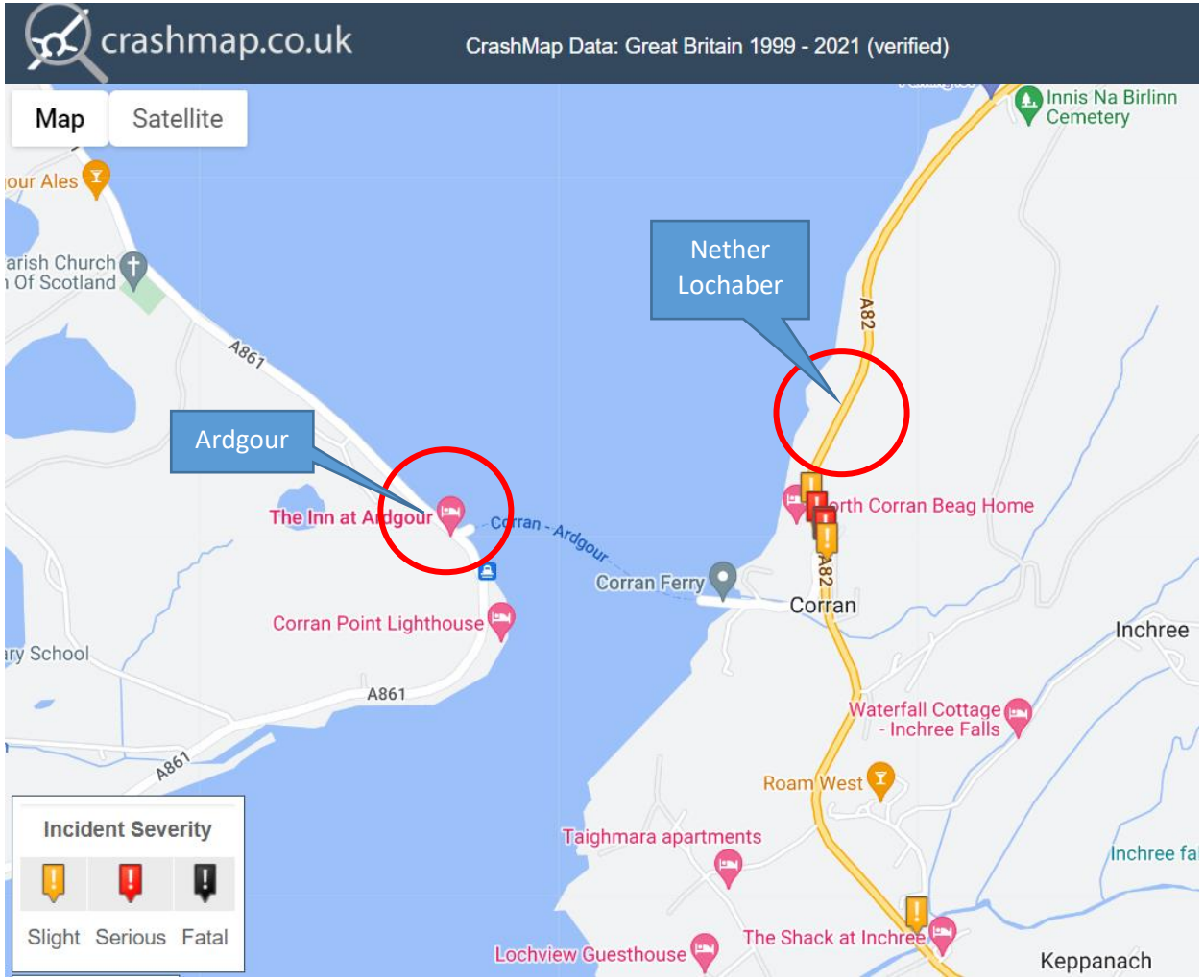
WYLLIE LODGE Limited. 23 St Andrew's Street Ayr KA7 3BT.		

Appendix A. Location Plan of Problems



Appendix B. Location of Recorded Collisions.

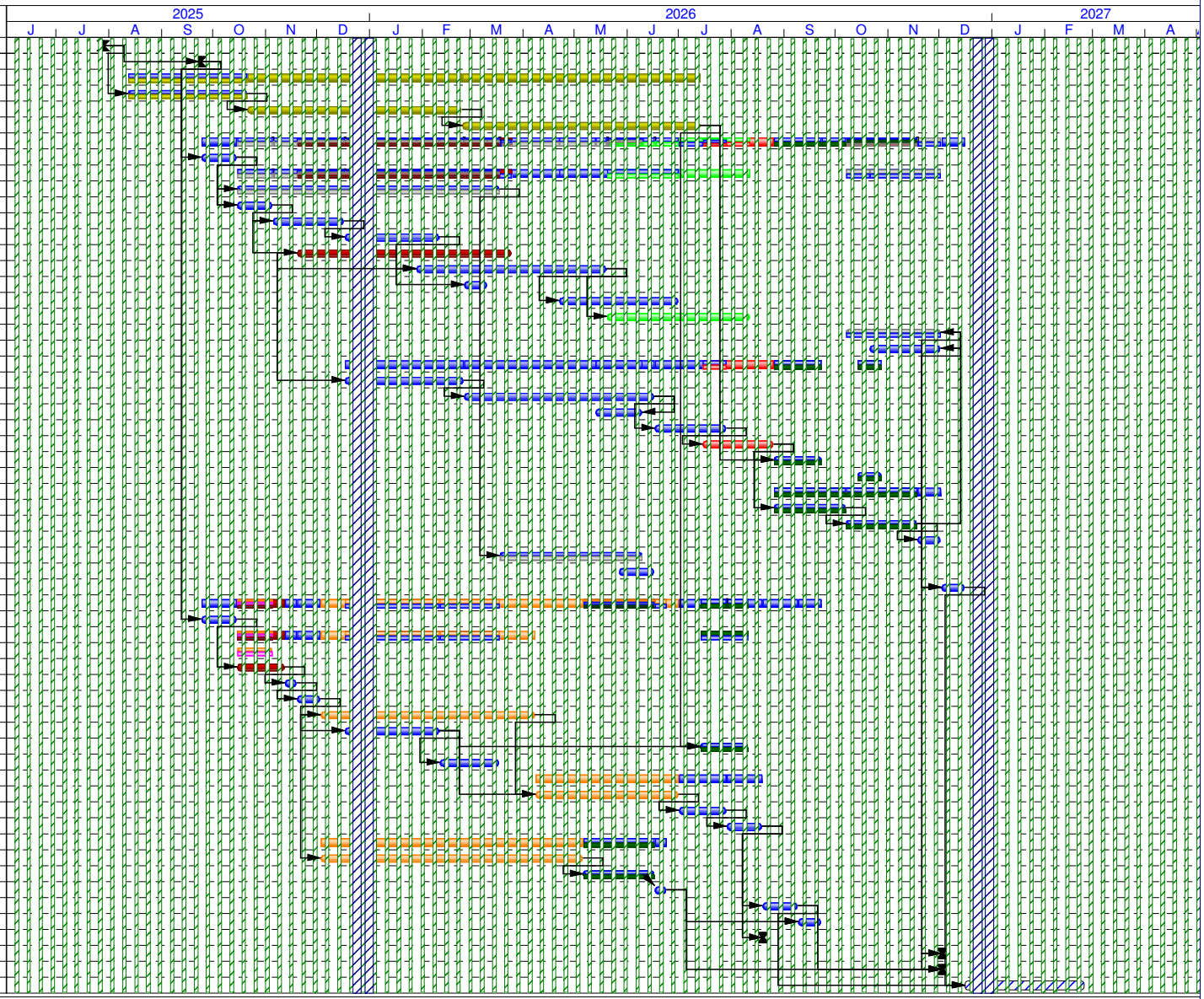


Annex D Construction Trip Generation Estimates

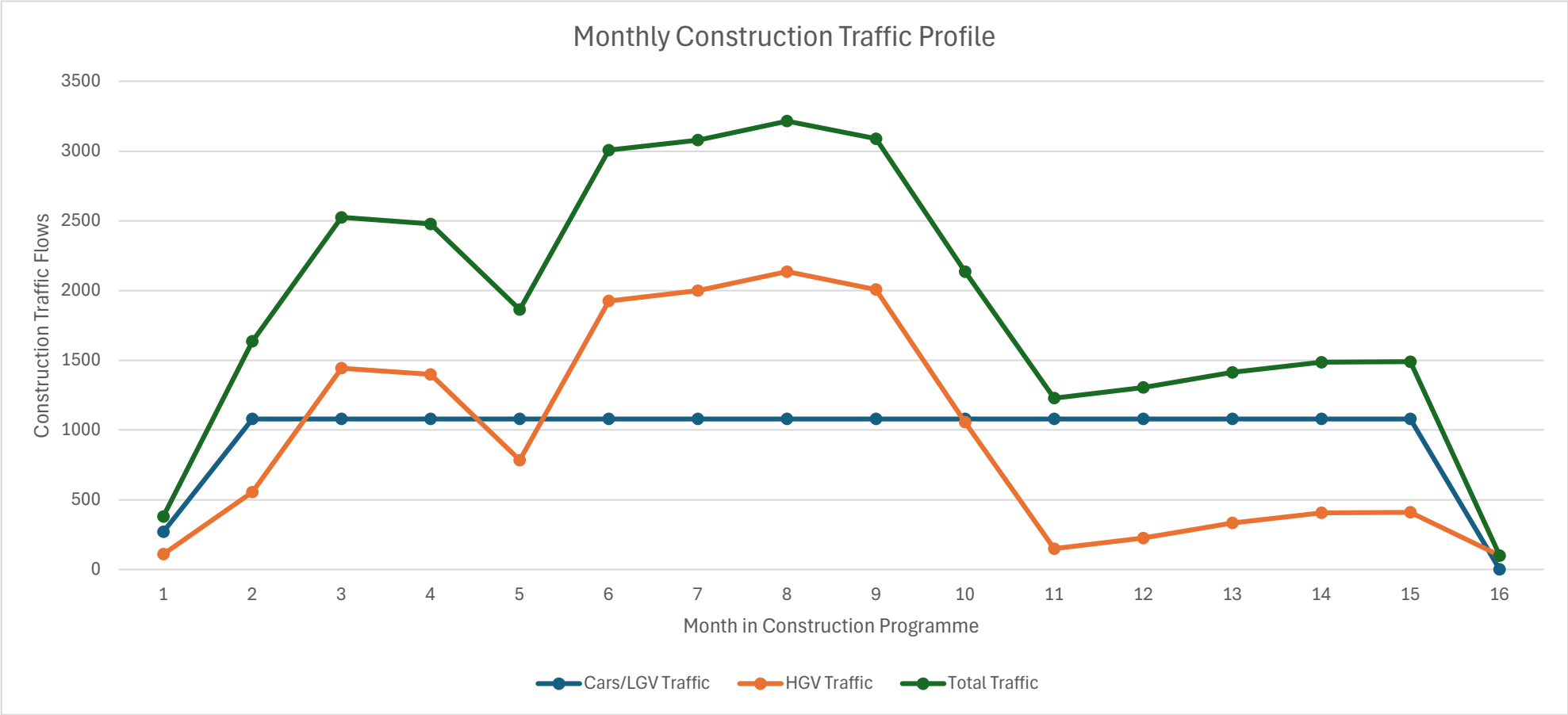
Corran Ferry Terminal Improvements

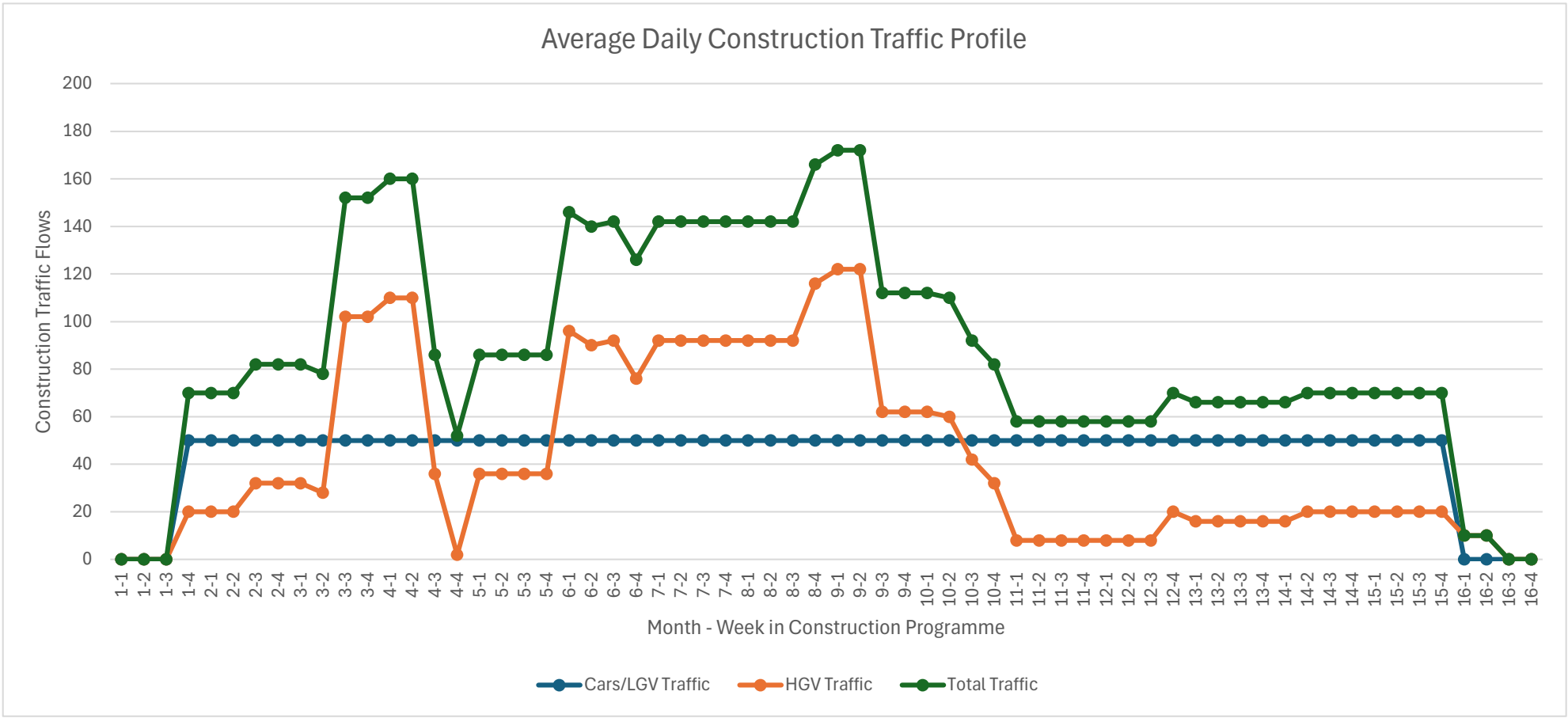
Indicative Construction Programme - Phase 1
Version: V01

ID	Name	Start	Duration	Finish
1	Contract Award	28/07/25	0.2w	28/07/25
2	Access Date	23/09/25	0.2w	23/09/25
3	Fendering - Procurement	12/08/25	46w	13/07/26
4	Procurement and Detailed Design	12/08/25	10w	20/10/25
5	Fabrication	21/10/25	16w	23/02/26
6	Shipment Period	24/02/26	20w	13/07/26
7	**NETHER LOCHABER WORKS**	24/09/25	62w	15/12/26
8	NL - Mobilisation and Site Establishment	24/09/25	3w	14/10/25
9	NL - Marshalling Area	15/10/25	57w	01/12/26
10	A82 - Road Junction	15/10/25	20w	17/03/26
11	NL - Vegetation Clearance - Junction	15/10/25	3w	04/11/25
12	NL - Vegetation Clearance - Marshalling Area	05/11/25	6w	16/12/25
13	NL - Excavation	17/12/25	6w	10/02/26
14	NL - Rock Dredge	19/11/25	16w	24/03/26
15	NL - Reclamation / Earthworks	28/01/26	16w	19/05/26
16	NL - Relocate Site Offices to Marshalling Area	25/02/26	2w	10/03/26
17	NL - Rock Armouring	22/04/26	10w	30/06/26
18	NL - Building - Toilet Facility	20/05/26	12w	11/08/26
19	NL - Surfacing	07/10/26	8w	01/12/26
20	NL - Furniture, Signage etc.	21/10/26	6w	01/12/26
21	NL - Alignment Structure	17/12/25	43w	27/10/26
22	NL - Breakwater - Core	17/12/25	8w	24/02/26
23	NL - Breakwater - Rock Armour	25/02/26	16w	16/06/26
24	NL - Fendering Thrust Block	13/05/26	4w	09/06/26
25	NL - Alignment Steelwork	17/06/26	6w	28/07/26
26	NL - Toe Pins	15/07/26	6w	25/08/26
27	NL - Fendering Installation	26/08/26	4w	22/09/26
28	NL - Fixtures and Fittings	14/10/26	2w	27/10/26
29	NL - Slipway	26/08/26	14w	01/12/26
30	NL - Walls	26/08/26	6w	06/10/26
31	NL - Slab	07/10/26	6w	17/11/26
32	NL - Fixtures, Scour Protection etc.	18/11/26	2w	01/12/26
33	NL - Footway / Cycleway Extension	18/03/26	12w	09/06/26
34	NL - Steps	27/05/26	3w	16/06/26
35	NL - Demobilisation	02/12/26	2w	15/12/26
36	**ARDGOUR WORKS**	24/09/25	50w	22/09/26
37	ARD - Mobilisation	24/09/25	3w	14/10/25
38	ARD - Overnight Approach Structure	15/10/25	40.8w	10/08/26
39	ARD - Cable Restraint and Removal Works	15/10/25	3w	04/11/25
40	ARD - Dredge	15/10/25	4w	11/11/25
41	ARD - Reclamation	12/11/25	1w	18/11/25
42	ARD - Rock Armouring	19/11/25	2w	02/12/25
43	ARD - Sheet Piling Approach	03/12/25	16w	07/04/26
44	ARD - Decking	17/12/25	6w	10/02/26
45	ARD - Fendering Installation	14/07/26	4w	10/08/26
46	ARD - Fixtures and Fittings	11/02/26	5w	17/03/26
47	ARD - Overnight Head Structure	08/04/26	19w	18/08/26
48	ARD - Sheet Piling and Infill	08/04/26	12w	30/06/26
49	ARD - Decking	01/07/26	4w	28/07/26
50	ARD - Fixtures and Fittings	29/07/26	3w	18/08/26
51	ARD - Slipway	03/12/25	27w	23/06/26
52	ARD - Sheet Piling	03/12/25	20w	05/05/26
53	ARD - Slab	06/05/26	6w	16/06/26
54	ARD - Fixtures and Fittings	17/06/26	1w	23/06/26
55	ARD - Existing Pier Demolition	19/08/26	3w	08/09/26
56	ARD - Demobilisation	09/09/26	2w	22/09/26
57	Relocate Vessels to ARD - Overnight Berth	19/08/26	0.2w	19/08/26
58	Relocate to New NL Ferry Terminal	02/12/26	0.2w	02/12/26
59	Relocate to New ARD Slipway	02/12/26	0.2w	02/12/26
60	Contractor's Float	16/12/26	8w	23/02/27



Fendering Fabricator
Diving Contractor
Drilling Contractor
Building Contractor
Dredge Contractor
Surfacing Contractor
Piling Contractor
Milestone
Maritime Civil Contractor
Specialist Contractor
Contractor's Float


Monthly Construction Traffic Profile
Construction Traffic Flows
3500
3000
2500
2000
1500
1000
500
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Month in Construction Programme
Cars/LGV Traffic
HGV Traffic
Total Traffic


Average Daily Construction Traffic Profile
Construction Traffic Flows
200
180
160
140
120
100
80
60
40
20
0
1-1 1-2 1-3 1-4 2-1 2-2 2-3 2-4 3-1 3-2 3-3 3-4 4-1 4-2 4-3 4-4 5-1 5-2 5-3 5-4 6-1 6-2 6-3 6-4 7-1 7-2 7-3 7-4 8-1 8-2 8-3 8-4 9-1 9-2 9-3 9-4 10-1 10-2 10-3 10-4 11-1 11-2 11-3 11-4 12-1 12-2 12-3 12-4 13-1 13-2 13-3 13-4 14-1 14-2 14-3 14-4 15-1 15-2 15-3 15-4 16-1 16-2 16-3 16-4
Month - Week in Construction Programme
Cars/LGV Traffic
HGV Traffic
Total Traffic

Annex E Estimated 2019 Corran Ferry Carryings (THC)

(2019 estimates)			PCU equivalent
Cars per year	266,000	=	266,000
Lorries per year	6,300	=	31,500
Buses per year	3,600	=	18,000
			315,500

PCU Carryings per year	**315,500**

Month	%	Carryings per month	Carryings per week	Carryings per day
Jan	4%	12,620	3,155	451
Feb	4%	12,620	3,155	451
Mar	5%	15,775	3,944	563
Apr	7%	22,085	5,521	789
May	9%	28,395	7,099	1,014
Jun	12%	37,860	9,465	1,352
Jul	15%	47,325	11,831	1,690
Aug	16%	50,480	12,620	1,803
Sep	12%	37,860	9,465	1,352
Oct	7%	22,085	5,521	789
Nov	5%	15,775	3,944	563
Dec	4%	12,620	3,155	451
Total	100%	315,500		
Average			6,573	939

Annex F Junction 9 Reports

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.2.1013
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Filename: Junction 4 A82 - Corran Slipway V3_20241119.j9
Path: \\RSBGUKFS01\WAKEngineer\data\A82 Corran
Report generation date: 19/11/2024 14:34:37

»2027, Weekday AM (inc. Ferry Trips)
»2027, Weekday PM (inc. Ferry Trips)
»2027, Saturday AM (inc. Ferry Trips)
»2027, Saturday PM (inc. Ferry Trips)
»2046, Weekday AM (inc. Ferry Trips)
»2046, Weekday PM (inc. Ferry Trips)
»2046, Saturday AM (inc. Ferry Trips)
»2046, Saturday PM (inc. Ferry Trips)

Summary of junction performance

	Weekday AM (inc. Ferry Trips)					Weekday PM (inc. Ferry Trips)					Saturday AM (inc. Ferry Trips)					Saturday PM (inc. Ferry Trips)				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
2027																				
Stream B-C	D1	0.1	8.06	0.10	A	D2	0.3	8.70	0.21	A	D3	0.2	9.58	0.16	A	D4	0.8	10.76	0.41	B
Stream B-A		0.4	13.96	0.27	B		0.3	13.91	0.23	B		1.3	19.48	0.53	C		0.1	10.26	0.05	B
Stream C-B		0.2	7.67	0.16	A		0.3	8.22	0.20	A		0.1	7.50	0.09	A		0.1	7.58	0.09	A
2046																				
Stream B-C	D5	0.2	9.74	0.16	A	D6	0.6	11.68	0.34	B	D7	0.6	31.61	0.33	D	D8	2.0	18.08	0.65	C
Stream B-A		1.0	21.75	0.47	C		0.7	21.13	0.40	C		5.9	54.75	0.90	F		0.1	11.94	0.08	B
Stream C-B		0.4	8.97	0.24	A		0.5	10.03	0.31	B		0.2	8.64	0.14	A		0.2	8.81	0.15	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	12/06/2024
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	PFGROUP\cebbrell
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perTimeSegment	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D1	2027	Weekday AM (inc. Ferry Trips)	DIRECT	11:45	12:45	60	15
D2	2027	Weekday PM (inc. Ferry Trips)	DIRECT	14:00	15:00	60	15
D3	2027	Saturday AM (inc. Ferry Trips)	DIRECT	11:30	12:30	60	15
D4	2027	Saturday PM (inc. Ferry Trips)	DIRECT	14:15	15:15	60	15
D5	2046	Weekday AM (inc. Ferry Trips)	DIRECT	11:45	12:45	60	15
D6	2046	Weekday PM (inc. Ferry Trips)	DIRECT	14:00	15:00	60	15
D7	2046	Saturday AM (inc. Ferry Trips)	DIRECT	11:30	12:30	60	15
D8	2046	Saturday PM (inc. Ferry Trips)	DIRECT	14:15	15:15	60	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2027, Weekday AM (inc. Ferry Trips)

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.01	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	A82 (S)		Major
B	Corran Slipway Access		Minor
C	A82 (N)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - A82 (N)	7.35		✓	3.40	155.0		-

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B - Corran Slipway Access	One lane plus flare	10.00	10.00	5.70	4.10	3.90	✓	2.00	81	49

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/TS)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	150.889	0.103	0.262	0.165	0.374
B-C	182.369	0.105	0.266	-	-
C-B	187.602	0.274	0.274	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D1	2027	Weekday AM (inc. Ferry Trips)	DIRECT	11:45	12:45	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - A82 (S)		✓	100.000
B - Corran Slipway Access		✓	100.000
C - A82 (N)		✓	100.000

Origin-Destination Data

11:45 - 12:00

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	10.00	65.00
	B - Corran Slipway Access	19.00	0.00	14.00
	C - A82 (N)	99.00	2.00	0.00

12:00 - 12:15

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	11.00	107.00
	B - Corran Slipway Access	28.00	0.00	6.00
	C - A82 (N)	91.00	15.00	0.00

12:15 - 12:30

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	10.00	89.00
	B - Corran Slipway Access	25.00	0.00	7.00
	C - A82 (N)	102.00	25.00	0.00

12:30 - 12:45

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	5.00	88.00
	B - Corran Slipway Access	17.00	0.00	16.00
	C - A82 (N)	112.00	4.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0	16	7
	B - Corran Slipway Access	16	0	16
	C - A82 (N)	7	16	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.10	8.06	0.1	A
B-A	0.27	13.96	0.4	B
C-A				
C-B	0.16	7.67	0.2	A
A-B				
A-C				

Main Results for each time segment

11:45 - 12:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	14.00	157.16	0.089	13.89	0.1	7.268	A
B-A	19.00	115.80	0.164	18.78	0.2	10.708	B
C-A	99.00			99.00			
C-B	2.00	167.08	0.012	1.99	0.0	6.307	A
A-B	10.00			10.00			
A-C	65.00			65.00			

12:00 - 12:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	6.00	135.25	0.044	6.06	0.1	8.064	A
B-A	28.00	102.15	0.274	27.80	0.4	13.961	B
C-A	91.00			91.00			
C-B	15.00	155.31	0.097	14.89	0.1	7.411	A
A-B	11.00			11.00			
A-C	107.00			107.00			

12:15 - 12:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7.00	141.80	0.049	6.99	0.1	7.724	A
B-A	25.00	100.97	0.248	25.04	0.4	13.724	B
C-A	102.00			102.00			
C-B	25.00	160.51	0.156	24.91	0.2	7.675	A
A-B	10.00			10.00			
A-C	89.00			89.00			

12:30 - 12:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	16.00	153.27	0.104	15.93	0.1	7.578	A
B-A	17.00	106.33	0.160	17.16	0.2	11.701	B
C-A	112.00			112.00			
C-B	4.00	162.15	0.025	4.18	0.0	6.598	A
A-B	5.00			5.00			
A-C	88.00			88.00			

2027, Weekday PM (inc. Ferry Trips)

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.05	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D2	2027	Weekday PM (inc. Ferry Trips)	DIRECT	14:00	15:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - A82 (S)		✓	100.000
B - Corran Slipway Access		✓	100.000
C - A82 (N)		✓	100.000

Origin-Destination Data

14:00 - 14:15

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	11.00	97.00
	B - Corran Slipway Access	22.00	0.00	31.00
	C - A82 (N)	81.00	32.00	0.00

14:15 - 14:30

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	14.00	99.00
	B - Corran Slipway Access	12.00	0.00	12.00
	C - A82 (N)	123.00	15.00	0.00

Demand (PCU/TS)

14:30 - 14:45

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	0.00	103.00
	B - Corran Slipway Access	18.00	0.00	15.00
	C - A82 (N)	116.00	0.00	0.00

Demand (PCU/TS)

14:45 - 15:00

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	29.00	70.00
	B - Corran Slipway Access	16.00	0.00	25.00
	C - A82 (N)	96.00	11.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0	16	5
	B - Corran Slipway Access	16	0	16
	C - A82 (N)	5	16	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.21	8.70	0.3	A
B-A	0.23	13.91	0.3	B
C-A				
C-B	0.20	8.22	0.3	A
A-B				
A-C				

Main Results for each time segment

14:00 - 14:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	31.00	150.06	0.207	30.70	0.3	8.702	A
B-A	22.00	96.21	0.229	21.66	0.3	13.908	B
C-A	81.00			81.00			
C-B	32.00	158.05	0.202	31.71	0.3	8.223	A
A-B	11.00			11.00			
A-C	97.00			97.00			

14:15 - 14:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	12.00	151.47	0.079	12.20	0.1	7.488	A
B-A	12.00	96.37	0.125	12.17	0.2	12.392	B
C-A	123.00			123.00			
C-B	15.00	156.68	0.096	15.17	0.1	7.368	A
A-B	14.00			14.00			
A-C	99.00			99.00			

14:30 - 14:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	15.00	148.81	0.101	14.97	0.1	7.778	A
B-A	18.00	104.27	0.173	17.93	0.2	12.050	B
C-A	116.00			116.00			
C-B	0.00	159.41	0.000	0.12	0.0	0.000	A
A-B	0.00			0.00			
A-C	103.00			103.00			

14:45 - 15:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	25.00	159.27	0.157	24.92	0.2	7.745	A
B-A	16.00	106.24	0.151	16.03	0.2	11.546	B
C-A	96.00			96.00			
C-B	11.00	160.51	0.069	10.92	0.1	6.958	A
A-B	29.00			29.00			
A-C	70.00			70.00			

2027, Saturday AM (inc. Ferry Trips)

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.12	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D3	2027	Saturday AM (inc. Ferry Trips)	DIRECT	11:30	12:30	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - A82 (S)		✓	100.000
B - Corran Slipway Access		✓	100.000
C - A82 (N)		✓	100.000

Origin-Destination Data

11:30 - 11:45

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	51.00	96.00
	B - Corran Slipway Access	38.00	0.00	21.00
	C - A82 (N)	87.00	5.00	0.00

11:45 - 12:00

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	42.00	75.00
	B - Corran Slipway Access	31.00	0.00	22.00
	C - A82 (N)	88.00	6.00	0.00

Demand (PCU/TS)

12:00 - 12:15

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	0.00	87.00
	B - Corran Slipway Access	0.00	0.00	0.00
	C - A82 (N)	79.00	0.00	0.00

Demand (PCU/TS)

12:15 - 12:30

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	55.00	73.00
	B - Corran Slipway Access	58.00	0.00	11.00
	C - A82 (N)	79.00	14.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0	16	6
	B - Corran Slipway Access	16	0	16
	C - A82 (N)	1	16	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.16	9.58	0.2	A
B-A	0.53	19.48	1.3	C
C-A				
C-B	0.09	7.50	0.1	A
A-B				
A-C				

Main Results for each time segment

11:30 - 11:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	21.00	133.95	0.157	20.79	0.2	9.186	A
B-A	38.00	105.33	0.361	37.36	0.6	15.185	C
C-A	87.00			87.00			
C-B	5.00	147.37	0.034	4.96	0.0	7.310	A
A-B	51.00			51.00			
A-C	96.00			96.00			

11:45 - 12:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	22.00	145.36	0.151	22.00	0.2	8.441	A
B-A	31.00	110.27	0.281	31.17	0.5	13.194	B
C-A	88.00			88.00			
C-B	6.00	155.58	0.039	5.99	0.0	6.960	A
A-B	42.00			42.00			
A-C	75.00			75.00			

12:00 - 12:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0.00	155.99	0.000	0.21	0.0	0.000	A
B-A	0.00	117.29	0.000	0.46	0.0	0.000	A
C-A	79.00			79.00			
C-B	0.00	163.79	0.000	0.05	0.0	0.000	A
A-B	0.00			0.00			
A-C	87.00			87.00			

12:15 - 12:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11.00	119.51	0.092	10.88	0.1	9.576	A
B-A	58.00	109.06	0.532	56.74	1.3	19.478	C
C-A	79.00			79.00			
C-B	14.00	152.57	0.092	13.88	0.1	7.501	A
A-B	55.00			55.00			
A-C	73.00			73.00			

2027, Saturday PM (inc. Ferry Trips)

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.16	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D4	2027	Saturday PM (inc. Ferry Trips)	DIRECT	14:15	15:15	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - A82 (S)		✓	100.000
B - Corran Slipway Access		✓	100.000
C - A82 (N)		✓	100.000

Origin-Destination Data

14:15 - 14:30

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	49.00	84.00
	B - Corran Slipway Access	0.00	0.00	66.00
	C - A82 (N)	83.00	14.00	0.00

14:30 - 14:45

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	0.00	73.00
	B - Corran Slipway Access	0.00	0.00	0.00
	C - A82 (N)	103.00	0.00	0.00

Demand (PCU/TS)

14:45 - 15:00

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	61.00	67.00
	B - Corran Slipway Access	2.00	0.00	3.00
	C - A82 (N)	95.00	13.00	0.00

Demand (PCU/TS)

15:00 - 15:15

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	66.00	83.00
	B - Corran Slipway Access	5.00	0.00	3.00
	C - A82 (N)	65.00	6.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0	16	1
	B - Corran Slipway Access	16	0	16
	C - A82 (N)	2	16	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.41	10.76	0.8	B
B-A	0.05	10.26	0.1	B
C-A				
C-B	0.09	7.58	0.1	A
A-B				
A-C				

Main Results for each time segment

14:15 - 14:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	66.00	161.28	0.409	65.21	0.8	10.755	B
B-A	0.00	97.05	0.000	0.00	0.0	0.000	A
C-A	83.00			83.00			
C-B	14.00	151.20	0.093	13.88	0.1	7.576	A
A-B	49.00			49.00			
A-C	84.00			84.00			

14:30 - 14:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0.00	169.69	0.000	0.79	0.0	0.000	A
B-A	0.00	106.15	0.000	0.00	0.0	0.000	A
C-A	103.00			103.00			
C-B	0.00	167.62	0.000	0.12	0.0	0.000	A
A-B	0.00			0.00			
A-C	73.00			73.00			

14:45 - 15:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	3.00	162.08	0.019	2.98	0.0	6.544	A
B-A	2.00	103.45	0.019	1.98	0.0	10.259	B
C-A	95.00			95.00			
C-B	13.00	152.57	0.085	12.89	0.1	7.450	A
A-B	61.00			61.00			
A-C	67.00			67.00			

15:00 - 15:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	3.00	150.34	0.020	3.00	0.0	7.066	A
B-A	5.00	110.26	0.045	4.97	0.1	9.886	A
C-A	65.00			65.00			
C-B	6.00	146.83	0.041	6.06	0.0	7.402	A
A-B	66.00			66.00			
A-C	83.00			83.00			

2046, Weekday AM (inc. Ferry Trips)

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.27	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D5	2046	Weekday AM (inc. Ferry Trips)	DIRECT	11:45	12:45	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - A82 (S)		✓	100.000
B - Corran Slipway Access		✓	100.000
C - A82 (N)		✓	100.000

Origin-Destination Data

11:45 - 12:00

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	15.00	81.00
	B - Corran Slipway Access	29.00	0.00	21.00
	C - A82 (N)	123.00	3.00	0.00

12:00 - 12:15

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	17.00	133.00
	B - Corran Slipway Access	41.00	0.00	9.00
	C - A82 (N)	113.00	23.00	0.00

12:15 - 12:30

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	15.00	111.00
	B - Corran Slipway Access	37.00	0.00	10.00
	C - A82 (N)	127.00	37.00	0.00

12:30 - 12:45

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	7.00	110.00
	B - Corran Slipway Access	25.00	0.00	23.00
	C - A82 (N)	140.00	7.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0	16	7
	B - Corran Slipway Access	16	0	16
	C - A82 (N)	7	16	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.16	9.74	0.2	A
B-A	0.47	21.75	1.0	C
C-A				
C-B	0.24	8.97	0.4	A
A-B				
A-C				

Main Results for each time segment

11:45 - 12:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	21.00	147.47	0.142	20.81	0.2	8.230	A
B-A	29.00	106.76	0.272	28.58	0.4	13.282	B
C-A	123.00			123.00			
C-B	3.00	161.33	0.019	2.98	0.0	6.593	A
A-B	15.00			15.00			
A-C	81.00			81.00			

12:00 - 12:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9.00	116.40	0.077	9.09	0.1	9.736	A
B-A	41.00	87.93	0.466	40.45	1.0	21.746	C
C-A	113.00			113.00			
C-B	23.00	146.55	0.157	22.81	0.2	8.424	A
A-B	17.00			17.00			
A-C	133.00			133.00			

12:15 - 12:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10.00	124.43	0.080	10.00	0.1	9.122	A
B-A	37.00	86.02	0.430	37.07	0.9	21.374	C
C-A	127.00			127.00			
C-B	37.00	153.12	0.242	36.85	0.4	8.967	A
A-B	15.00			15.00			
A-C	111.00			111.00			

12:30 - 12:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	23.00	142.26	0.162	22.88	0.2	8.736	A
B-A	25.00	94.72	0.264	25.48	0.4	15.177	C
C-A	140.00			140.00			
C-B	7.00	155.58	0.045	7.31	0.1	7.057	A
A-B	7.00			7.00			
A-C	110.00			110.00			

2046, Weekday PM (inc. Ferry Trips)

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.22	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D6	2046	Weekday PM (inc. Ferry Trips)	DIRECT	14:00	15:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - A82 (S)		✓	100.000
B - Corran Slipway Access		✓	100.000
C - A82 (N)		✓	100.000

Origin-Destination Data

14:00 - 14:15

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	16.00	121.00
	B - Corran Slipway Access	32.00	0.00	46.00
	C - A82 (N)	100.00	47.00	0.00

14:15 - 14:30

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	20.00	123.00
	B - Corran Slipway Access	17.00	0.00	17.00
	C - A82 (N)	153.00	23.00	0.00

14:30 - 14:45

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	0.00	128.00
	B - Corran Slipway Access	26.00	0.00	22.00
	C - A82 (N)	144.00	0.00	0.00

14:45 - 15:00

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	43.00	87.00
	B - Corran Slipway Access	24.00	0.00	37.00
	C - A82 (N)	119.00	16.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0	16	5
	B - Corran Slipway Access	16	0	16
	C - A82 (N)	5	16	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.34	11.68	0.6	B
B-A	0.40	21.13	0.7	C
C-A				
C-B	0.31	10.03	0.5	B
A-B				
A-C				

Main Results for each time segment

14:00 - 14:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	46.00	134.23	0.343	45.41	0.6	11.679	B
B-A	32.00	79.97	0.400	31.26	0.7	21.130	C
C-A	100.00			100.00			
C-B	47.00	150.11	0.313	46.48	0.5	10.025	B
A-B	16.00			16.00			
A-C	121.00			121.00			

14:15 - 14:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	17.00	140.92	0.121	17.43	0.2	8.483	A
B-A	17.00	81.63	0.208	17.43	0.3	16.367	C
C-A	153.00			153.00			
C-B	23.00	148.47	0.155	23.31	0.2	8.362	A
A-B	20.00			20.00			
A-C	123.00			123.00			

14:30 - 14:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	22.00	137.68	0.160	21.94	0.2	9.015	A
B-A	26.00	92.99	0.280	25.87	0.4	15.522	C
C-A	144.00			144.00			
C-B	0.00	152.57	0.000	0.21	0.0	0.000	A
A-B	0.00			0.00			
A-C	128.00			128.00			

14:45 - 15:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	37.00	148.40	0.249	36.84	0.4	9.345	A
B-A	24.00	94.73	0.253	24.04	0.4	14.778	B
C-A	119.00			119.00			
C-B	16.00	152.02	0.105	15.86	0.1	7.659	A
A-B	43.00			43.00			
A-C	87.00			87.00			

2046, Saturday AM (inc. Ferry Trips)

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		9.73	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D7	2046	Saturday AM (inc. Ferry Trips)	DIRECT	11:30	12:30	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - A82 (S)		✓	100.000
B - Corran Slipway Access		✓	100.000
C - A82 (N)		✓	100.000

Origin-Destination Data

11:30 - 11:45

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	76.00	120.00
	B - Corran Slipway Access	56.00	0.00	31.00
	C - A82 (N)	108.00	7.00	0.00

11:45 - 12:00

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	62.00	93.00
	B - Corran Slipway Access	47.00	0.00	32.00
	C - A82 (N)	110.00	9.00	0.00

Demand (PCU/TS)

12:00 - 12:15

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	0.00	109.00
	B - Corran Slipway Access	0.00	0.00	0.00
	C - A82 (N)	99.00	0.00	0.00

Demand (PCU/TS)

12:15 - 12:30

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	82.00	91.00
	B - Corran Slipway Access	86.00	0.00	16.00
	C - A82 (N)	98.00	20.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0	16	6
	B - Corran Slipway Access	16	0	16
	C - A82 (N)	1	16	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.33	31.61	0.6	D
B-A	0.90	54.75	5.9	F
C-A				
C-B	0.14	8.64	0.2	A
A-B				
A-C				

Main Results for each time segment

11:30 - 11:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	31.00	105.50	0.294	30.53	0.5	13.842	B
B-A	56.00	91.22	0.614	54.29	1.7	27.179	D
C-A	108.00			108.00			
C-B	7.00	133.96	0.052	6.94	0.1	8.214	A
A-B	76.00			76.00			
A-C	120.00			120.00			

11:45 - 12:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32.00	125.01	0.256	32.07	0.4	11.241	B
B-A	47.00	98.27	0.478	47.60	1.1	20.844	C
C-A	110.00			110.00			
C-B	9.00	145.18	0.062	8.99	0.1	7.665	A
A-B	62.00			62.00			
A-C	93.00			93.00			

12:00 - 12:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0.00	148.89	0.000	0.41	0.0	0.000	A
B-A	0.00	106.13	0.000	1.11	0.0	0.000	A
C-A	99.00			99.00			
C-B	0.00	157.77	0.000	0.08	0.0	0.000	A
A-B	0.00			0.00			
A-C	109.00			109.00			

12:15 - 12:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	16.00	47.97	0.334	15.45	0.6	31.612	D
B-A	86.00	95.74	0.898	80.07	5.9	54.746	F
C-A	98.00			98.00			
C-B	20.00	140.26	0.143	19.81	0.2	8.641	A
A-B	82.00			82.00			
A-C	91.00			91.00			

2046, Saturday PM (inc. Ferry Trips)

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.02	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D8	2046	Saturday PM (inc. Ferry Trips)	DIRECT	14:15	15:15	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - A82 (S)		✓	100.000
B - Corran Slipway Access		✓	100.000
C - A82 (N)		✓	100.000

Origin-Destination Data

14:15 - 14:30

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	72.00	105.00
	B - Corran Slipway Access	0.00	0.00	99.00
	C - A82 (N)	104.00	21.00	0.00

14:30 - 14:45

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	0.00	91.00
	B - Corran Slipway Access	0.00	0.00	0.00
	C - A82 (N)	128.00	0.00	0.00

14:45 - 15:00

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	91.00	84.00
	B - Corran Slipway Access	4.00	0.00	4.00
	C - A82 (N)	119.00	20.00	0.00

15:00 - 15:15

Demand (PCU/TS)

		To		
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0.00	98.00	104.00
	B - Corran Slipway Access	8.00	0.00	4.00
	C - A82 (N)	81.00	9.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - A82 (S)	B - Corran Slipway Access	C - A82 (N)
From	A - A82 (S)	0	16	1
	B - Corran Slipway Access	16	0	16
	C - A82 (N)	2	16	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.65	18.08	2.0	C
B-A	0.08	11.94	0.1	B
C-A				
C-B	0.15	8.81	0.2	A
A-B				
A-C				

Main Results for each time segment

14:15 - 14:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	99.00	152.94	0.647	96.99	2.0	18.075	C
B-A	0.00	84.16	0.000	0.00	0.0	0.000	A
C-A	104.00			104.00			
C-B	21.00	139.16	0.151	20.80	0.2	8.805	A
A-B	72.00			72.00			
A-C	105.00			105.00			

14:30 - 14:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0.00	164.71	0.000	2.01	0.0	0.000	A
B-A	0.00	97.96	0.000	0.00	0.0	0.000	A
C-A	128.00			128.00			
C-B	0.00	162.70	0.000	0.20	0.0	0.000	A
A-B	0.00			0.00			
A-C	91.00			91.00			

14:45 - 15:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	4.00	150.72	0.027	3.97	0.0	7.111	A
B-A	4.00	91.29	0.044	3.95	0.1	11.944	B
C-A	119.00			119.00			
C-B	20.00	139.71	0.143	19.81	0.2	8.693	A
A-B	91.00			91.00			
A-C	84.00			84.00			

15:00 - 15:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	4.00	139.23	0.029	4.00	0.0	7.719	A
B-A	8.00	98.25	0.081	7.95	0.1	11.556	B
C-A	81.00			81.00			
C-B	9.00	132.32	0.068	9.11	0.1	8.479	A
A-B	98.00			98.00			
A-C	104.00			104.00			

Junctions 9

PICADY 9 - Priority Intersection Module

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Filename: Junction 4 A82 - Corran Slipway (ARM A - LEFT TURN ASSESSMENT) V2_20241119.j9
Path: P:\data\A82 Corran
Report generation date: 19/11/2024 12:51:08

»2027, Weekday AM (inc. Ferry Trips)
»2027, Weekday PM (inc. Ferry Trips)
»2027, Saturday AM (inc. Ferry Trips)
»2027, Saturday PM (inc. Ferry Trips)
»2046, Weekday AM (inc. Ferry Trips)
»2046, Weekday PM (inc. Ferry Trips)
»2046, Saturday AM (inc. Ferry Trips)
»2046, Saturday PM (inc. Ferry Trips)

Summary of junction performance

	Weekday AM (inc. Ferry Trips)					Weekday PM (inc. Ferry Trips)					Saturday AM (inc. Ferry Trips)					Saturday PM (inc. Ferry Trips)				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
2027																				
Stream B-C	D1	0.1	5.76	0.07	A	D2	0.2	6.23	0.17	A	D3	0.5	7.62	0.32	A	D4	0.6	8.30	0.38	A
Stream B-A		0.0	0.00	0.00	A		0.0	0.00	0.00	A		0.0	0.00	0.00	A		0.0	0.00	0.00	A
Stream C-AB		0.0	0.00	0.00	A		0.0	0.00	0.00	A		0.0	0.00	0.00	A		0.0	0.00	0.00	A
2046																				
Stream B-C	D5	0.1	5.96	0.10	A	D6	0.3	6.96	0.25	A	D7	0.9	9.96	0.48	A	D8	1.3	11.86	0.56	B
Stream B-A		0.0	0.00	0.00	A		0.0	0.00	0.00	A		0.0	0.00	0.00	A		0.0	0.00	0.00	A
Stream C-AB		0.0	0.00	0.00	A		0.0	0.00	0.00	A		0.0	0.00	0.00	A		0.0	0.00	0.00	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	12/06/2024
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	PFGROUP\cebbrell
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perTimeSegment	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D1	2027	Weekday AM (inc. Ferry Trips)	DIRECT	11:45	12:45	60	15
D2	2027	Weekday PM (inc. Ferry Trips)	DIRECT	14:00	15:00	60	15
D3	2027	Saturday AM (inc. Ferry Trips)	DIRECT	11:30	12:30	60	15
D4	2027	Saturday PM (inc. Ferry Trips)	DIRECT	14:15	15:15	60	15
D5	2046	Weekday AM (inc. Ferry Trips)	DIRECT	11:45	12:45	60	15
D6	2046	Weekday PM (inc. Ferry Trips)	DIRECT	14:00	15:00	60	15
D7	2046	Saturday AM (inc. Ferry Trips)	DIRECT	11:30	12:30	60	15
D8	2046	Saturday PM (inc. Ferry Trips)	DIRECT	14:15	15:15	60	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2027, Weekday AM (inc. Ferry Trips)

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.08	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Corran Slipway Access		Major
B	A82 (S) - LT Lane		Minor
C	Corran Slipway Access		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - Corran Slipway Access	6.20	✓	0.00		0.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B - A82 (S) - LT Lane	One lane plus flare	8.30	5.30	4.60	3.40	3.40		1.00	43	0

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/TS)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	100.679	0.073	0.184	0.116	0.263
B-C	175.974	0.107	0.270	-	-
C-B	143.491	0.220	0.220	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D1	2027	Weekday AM (inc. Ferry Trips)	DIRECT	11:45	12:45	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - Corran Slipway Access		✓	100.000
B - A82 (S) - LT Lane		✓	100.000
C - Corran Slipway Access		✓	100.000

Origin-Destination Data

11:45 - 12:00

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	2.00
	B - A82 (S) - LT Lane	0.00	0.00	10.00
	C - Corran Slipway Access	0.00	0.00	0.00

12:00 - 12:15

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	15.00
	B - A82 (S) - LT Lane	0.00	0.00	11.00
	C - Corran Slipway Access	0.00	0.00	0.00

12:15 - 12:30

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	25.00
	B - A82 (S) - LT Lane	0.00	0.00	10.00
	C - Corran Slipway Access	0.00	0.00	0.00

12:30 - 12:45

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	32.00
	B - A82 (S) - LT Lane	0.00	0.00	11.00
	C - Corran Slipway Access	0.00	0.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0	0	0
	B - A82 (S) - LT Lane	0	0	0
	C - Corran Slipway Access	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.07	5.76	0.1	A
B-A	0.00	0.00	0.0	A
C-AB	0.00	0.00	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

11:45 - 12:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10.00	175.43	0.057	9.94	0.1	5.437	A
B-A	0.00	100.31	0.000	0.00	0.0	0.000	A
C-AB	0.00	143.05	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	2.00			2.00			

12:00 - 12:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11.00	171.92	0.064	10.99	0.1	5.592	A
B-A	0.00	97.92	0.000	0.00	0.0	0.000	A
C-AB	0.00	140.18	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	15.00			15.00			

12:15 - 12:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10.00	169.21	0.059	10.00	0.1	5.652	A
B-A	0.00	96.08	0.000	0.00	0.0	0.000	A
C-AB	0.00	137.98	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	25.00			25.00			

12:30 - 12:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11.00	167.32	0.066	10.99	0.1	5.756	A
B-A	0.00	94.80	0.000	0.00	0.0	0.000	A
C-AB	0.00	136.44	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	32.00			32.00			

2027, Weekday PM (inc. Ferry Trips)

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.00	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D2	2027	Weekday PM (inc. Ferry Trips)	DIRECT	14:00	15:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - Corran Slipway Access		✓	100.000
B - A82 (S) - LT Lane		✓	100.000
C - Corran Slipway Access		✓	100.000

Origin-Destination Data

14:00 - 14:15

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	32.00
	B - A82 (S) - LT Lane	0.00	0.00	11.00
	C - Corran Slipway Access	0.00	0.00	0.00

14:15 - 14:30

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	15.00
	B - A82 (S) - LT Lane	0.00	0.00	14.00
	C - Corran Slipway Access	0.00	0.00	0.00

Demand (PCU/TS)

14:30 - 14:45

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	0.00
	B - A82 (S) - LT Lane	0.00	0.00	0.00
	C - Corran Slipway Access	0.00	0.00	0.00

Demand (PCU/TS)

14:45 - 15:00

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	11.00
	B - A82 (S) - LT Lane	0.00	0.00	29.00
	C - Corran Slipway Access	0.00	0.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0	0	0
	B - A82 (S) - LT Lane	0	0	0
	C - Corran Slipway Access	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.17	6.23	0.2	A
B-A	0.00	0.00	0.0	A
C-AB	0.00	0.00	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

14:00 - 14:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11.00	167.32	0.066	10.93	0.1	5.752	A
B-A	0.00	94.80	0.000	0.00	0.0	0.000	A
C-AB	0.00	136.44	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	32.00			32.00			

14:15 - 14:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	14.00	171.92	0.081	13.98	0.1	5.698	A
B-A	0.00	97.92	0.000	0.00	0.0	0.000	A
C-AB	0.00	140.18	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	15.00			15.00			

14:30 - 14:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0.00	175.97	0.000	0.09	0.0	0.000	A
B-A	0.00	100.68	0.000	0.00	0.0	0.000	A
C-AB	0.00	143.49	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	0.00			0.00			

14:45 - 15:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	29.00	173.00	0.168	28.80	0.2	6.232	A
B-A	0.00	98.66	0.000	0.00	0.0	0.000	A
C-AB	0.00	141.07	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	11.00			11.00			

2027, Saturday AM (inc. Ferry Trips)

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		6.52	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D3	2027	Saturday AM (inc. Ferry Trips)	DIRECT	11:30	12:30	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - Corran Slipway Access		✓	100.000
B - A82 (S) - LT Lane		✓	100.000
C - Corran Slipway Access		✓	100.000

Origin-Destination Data

11:30 - 11:45

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	5.00
	B - A82 (S) - LT Lane	0.00	0.00	51.00
	C - Corran Slipway Access	0.00	0.00	0.00

11:45 - 12:00

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	6.00
	B - A82 (S) - LT Lane	0.00	0.00	42.00
	C - Corran Slipway Access	0.00	0.00	0.00

Demand (PCU/TS)

12:00 - 12:15

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	0.00
	B - A82 (S) - LT Lane	0.00	0.00	0.00
	C - Corran Slipway Access	0.00	0.00	0.00

Demand (PCU/TS)

12:15 - 12:30

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	14.00
	B - A82 (S) - LT Lane	0.00	0.00	55.00
	C - Corran Slipway Access	0.00	0.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0	0	0
	B - A82 (S) - LT Lane	0	0	0
	C - Corran Slipway Access	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.32	7.62	0.5	A
B-A	0.00	0.00	0.0	A
C-AB	0.00	0.00	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

11:30 - 11:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	51.00	174.62	0.292	50.59	0.4	7.233	A
B-A	0.00	99.76	0.000	0.00	0.0	0.000	A
C-AB	0.00	142.39	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	5.00			5.00			

11:45 - 12:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	42.00	174.35	0.241	42.09	0.3	6.811	A
B-A	0.00	99.58	0.000	0.00	0.0	0.000	A
C-AB	0.00	142.17	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	6.00			6.00			

12:00 - 12:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0.00	175.97	0.000	0.32	0.0	0.000	A
B-A	0.00	100.68	0.000	0.00	0.0	0.000	A
C-AB	0.00	143.49	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	0.00			0.00			

12:15 - 12:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	55.00	172.19	0.319	54.54	0.5	7.621	A
B-A	0.00	98.11	0.000	0.00	0.0	0.000	A
C-AB	0.00	140.40	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	14.00			14.00			

2027, Saturday PM (inc. Ferry Trips)

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		6.99	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D4	2027	Saturday PM (inc. Ferry Trips)	DIRECT	14:15	15:15	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - Corran Slipway Access		✓	100.000
B - A82 (S) - LT Lane		✓	100.000
C - Corran Slipway Access		✓	100.000

Origin-Destination Data

14:15 - 14:30

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	14.00
	B - A82 (S) - LT Lane	0.00	0.00	49.00
	C - Corran Slipway Access	0.00	0.00	0.00

14:30 - 14:45

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	0.00
	B - A82 (S) - LT Lane	0.00	0.00	0.00
	C - Corran Slipway Access	0.00	0.00	0.00

Demand (PCU/TS)

14:45 - 15:00

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	13.00
	B - A82 (S) - LT Lane	0.00	0.00	61.00
	C - Corran Slipway Access	0.00	0.00	0.00

Demand (PCU/TS)

15:00 - 15:15

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	6.00
	B - A82 (S) - LT Lane	0.00	0.00	66.00
	C - Corran Slipway Access	0.00	0.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0	0	0
	B - A82 (S) - LT Lane	0	0	0
	C - Corran Slipway Access	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.38	8.30	0.6	A
B-A	0.00	0.00	0.0	A
C-AB	0.00	0.00	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

14:15 - 14:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	49.00	172.19	0.285	48.61	0.4	7.259	A
B-A	0.00	98.11	0.000	0.00	0.0	0.000	A
C-AB	0.00	140.40	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	14.00			14.00			

14:30 - 14:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0.00	175.97	0.000	0.39	0.0	0.000	A
B-A	0.00	100.68	0.000	0.00	0.0	0.000	A
C-AB	0.00	143.49	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	0.00			0.00			

14:45 - 15:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	61.00	172.46	0.354	60.46	0.5	7.998	A
B-A	0.00	98.29	0.000	0.00	0.0	0.000	A
C-AB	0.00	140.62	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	13.00			13.00			

15:00 - 15:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	66.00	174.35	0.379	65.94	0.6	8.296	A
B-A	0.00	99.58	0.000	0.00	0.0	0.000	A
C-AB	0.00	142.17	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	6.00			6.00			

2046, Weekday AM (inc. Ferry Trips)

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.60	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D5	2046	Weekday AM (inc. Ferry Trips)	DIRECT	11:45	12:45	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - Corran Slipway Access		✓	100.000
B - A82 (S) - LT Lane		✓	100.000
C - Corran Slipway Access		✓	100.000

Origin-Destination Data

11:45 - 12:00

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	3.00
	B - A82 (S) - LT Lane	0.00	0.00	15.00
	C - Corran Slipway Access	0.00	0.00	0.00

12:00 - 12:15

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	23.00
	B - A82 (S) - LT Lane	0.00	0.00	17.00
	C - Corran Slipway Access	0.00	0.00	0.00

12:15 - 12:30

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	37.00
	B - A82 (S) - LT Lane	0.00	0.00	15.00
	C - Corran Slipway Access	0.00	0.00	0.00

12:30 - 12:45

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	7.00
	B - A82 (S) - LT Lane	0.00	0.00	7.00
	C - Corran Slipway Access	0.00	0.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0	0	0
	B - A82 (S) - LT Lane	0	0	0
	C - Corran Slipway Access	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.10	5.96	0.1	A
B-A	0.00	0.00	0.0	A
C-AB	0.00	0.00	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

11:45 - 12:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	15.00	175.16	0.086	14.91	0.1	5.614	A
B-A	0.00	100.13	0.000	0.00	0.0	0.000	A
C-AB	0.00	142.83	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	3.00			3.00			

12:00 - 12:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	17.00	169.76	0.100	16.98	0.1	5.891	A
B-A	0.00	96.45	0.000	0.00	0.0	0.000	A
C-AB	0.00	138.42	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	23.00			23.00			

12:15 - 12:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	15.00	165.97	0.090	15.01	0.1	5.961	A
B-A	0.00	93.88	0.000	0.00	0.0	0.000	A
C-AB	0.00	135.33	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	37.00			37.00			

12:30 - 12:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7.00	174.08	0.040	7.06	0.0	5.391	A
B-A	0.00	99.39	0.000	0.00	0.0	0.000	A
C-AB	0.00	141.95	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	7.00			7.00			

2046, Weekday PM (inc. Ferry Trips)

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.33	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D6	2046	Weekday PM (inc. Ferry Trips)	DIRECT	14:00	15:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - Corran Slipway Access		✓	100.000
B - A82 (S) - LT Lane		✓	100.000
C - Corran Slipway Access		✓	100.000

Origin-Destination Data

14:00 - 14:15

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	47.00
	B - A82 (S) - LT Lane	0.00	0.00	16.00
	C - Corran Slipway Access	0.00	0.00	0.00

14:15 - 14:30

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	23.00
	B - A82 (S) - LT Lane	0.00	0.00	20.00
	C - Corran Slipway Access	0.00	0.00	0.00

14:30 - 14:45

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	0.00
	B - A82 (S) - LT Lane	0.00	0.00	0.00
	C - Corran Slipway Access	0.00	0.00	0.00

14:45 - 15:00

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	16.00
	B - A82 (S) - LT Lane	0.00	0.00	43.00
	C - Corran Slipway Access	0.00	0.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0	0	0
	B - A82 (S) - LT Lane	0	0	0
	C - Corran Slipway Access	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.25	6.96	0.3	A
B-A	0.00	0.00	0.0	A
C-AB	0.00	0.00	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

14:00 - 14:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	16.00	163.27	0.098	15.89	0.1	6.103	A
B-A	0.00	92.04	0.000	0.00	0.0	0.000	A
C-AB	0.00	133.13	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	47.00			47.00			

14:15 - 14:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	20.00	169.76	0.118	19.98	0.1	6.009	A
B-A	0.00	96.45	0.000	0.00	0.0	0.000	A
C-AB	0.00	138.42	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	23.00			23.00			

14:30 - 14:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0.00	175.97	0.000	0.13	0.0	0.000	A
B-A	0.00	100.68	0.000	0.00	0.0	0.000	A
C-AB	0.00	143.49	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	0.00			0.00			

14:45 - 15:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	43.00	171.65	0.251	42.67	0.3	6.962	A
B-A	0.00	97.74	0.000	0.00	0.0	0.000	A
C-AB	0.00	139.96	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	16.00			16.00			

2046, Saturday AM (inc. Ferry Trips)

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		8.56	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D7	2046	Saturday AM (inc. Ferry Trips)	DIRECT	11:30	12:30	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - Corran Slipway Access		✓	100.000
B - A82 (S) - LT Lane		✓	100.000
C - Corran Slipway Access		✓	100.000

Origin-Destination Data

11:30 - 11:45

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	7.00
	B - A82 (S) - LT Lane	0.00	0.00	76.00
	C - Corran Slipway Access	0.00	0.00	0.00

11:45 - 12:00

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	9.00
	B - A82 (S) - LT Lane	0.00	0.00	62.00
	C - Corran Slipway Access	0.00	0.00	0.00

Demand (PCU/TS)

12:00 - 12:15

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	0.00
	B - A82 (S) - LT Lane	0.00	0.00	0.00
	C - Corran Slipway Access	0.00	0.00	0.00

Demand (PCU/TS)

12:15 - 12:30

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	20.00
	B - A82 (S) - LT Lane	0.00	0.00	82.00
	C - Corran Slipway Access	0.00	0.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0	0	0
	B - A82 (S) - LT Lane	0	0	0
	C - Corran Slipway Access	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.48	9.96	0.9	A
B-A	0.00	0.00	0.0	A
C-AB	0.00	0.00	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

11:30 - 11:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	76.00	174.08	0.437	75.24	0.8	9.039	A
B-A	0.00	99.39	0.000	0.00	0.0	0.000	A
C-AB	0.00	141.95	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	7.00			7.00			

11:45 - 12:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	62.00	173.54	0.357	62.20	0.6	8.097	A
B-A	0.00	99.02	0.000	0.00	0.0	0.000	A
C-AB	0.00	141.51	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	9.00			9.00			

12:00 - 12:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0.00	175.97	0.000	0.56	0.0	0.000	A
B-A	0.00	100.68	0.000	0.00	0.0	0.000	A
C-AB	0.00	143.49	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	0.00			0.00			

12:15 - 12:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	82.00	170.57	0.481	81.09	0.9	9.962	A
B-A	0.00	97.00	0.000	0.00	0.0	0.000	A
C-AB	0.00	139.08	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	20.00			20.00			

2046, Saturday PM (inc. Ferry Trips)

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		9.95	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D8	2046	Saturday PM (inc. Ferry Trips)	DIRECT	14:15	15:15	60	15

Vehicle mix source	PCU Factor for a HV (PCU)	O-D data varies over time
HV Percentages	2.00	✓

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Scaling Factor (%)
A - Corran Slipway Access		✓	100.000
B - A82 (S) - LT Lane		✓	100.000
C - Corran Slipway Access		✓	100.000

Origin-Destination Data

14:15 - 14:30

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	21.00
	B - A82 (S) - LT Lane	0.00	0.00	72.00
	C - Corran Slipway Access	0.00	0.00	0.00

14:30 - 14:45

Demand (PCU/TS)

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	0.00
	B - A82 (S) - LT Lane	0.00	0.00	0.00
	C - Corran Slipway Access	0.00	0.00	0.00

Demand (PCU/TS)

14:45 - 15:00

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	20.00
	B - A82 (S) - LT Lane	0.00	0.00	91.00
	C - Corran Slipway Access	0.00	0.00	0.00

Demand (PCU/TS)

15:00 - 15:15

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0.00	0.00	9.00
	B - A82 (S) - LT Lane	0.00	0.00	98.00
	C - Corran Slipway Access	0.00	0.00	0.00

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Corran Slipway Access	B - A82 (S) - LT Lane	C - Corran Slipway Access
From	A - Corran Slipway Access	0	0	0
	B - A82 (S) - LT Lane	0	0	0
	C - Corran Slipway Access	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.56	11.86	1.3	B
B-A	0.00	0.00	0.0	A
C-AB	0.00	0.00	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

14:15 - 14:30

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	72.00	170.30	0.423	71.28	0.7	9.026	A
B-A	0.00	96.82	0.000	0.00	0.0	0.000	A
C-AB	0.00	138.86	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	21.00			21.00			

14:30 - 14:45

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0.00	175.97	0.000	0.72	0.0	0.000	A
B-A	0.00	100.68	0.000	0.00	0.0	0.000	A
C-AB	0.00	143.49	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	0.00			0.00			

14:45 - 15:00

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	91.00	170.57	0.534	89.89	1.1	11.010	B
B-A	0.00	97.00	0.000	0.00	0.0	0.000	A
C-AB	0.00	139.08	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	20.00			20.00			

15:00 - 15:15

Stream	Total Demand (PCU/TS)	Capacity (PCU/TS)	RFC	Throughput (PCU/TS)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	98.00	173.54	0.565	97.85	1.3	11.859	B
B-A	0.00	99.02	0.000	0.00	0.0	0.000	A
C-AB	0.00	141.51	0.000	0.00	0.0	0.000	A
C-A	0.00			0.00			
A-B	0.00			0.00			
A-C	9.00			9.00			

Corran Ferry Infrastructure Improvement Scheme

Appendix Q.1: Navigational Risk Assessment

making it happen

Wallace Stone
Consulting Civil Engineers

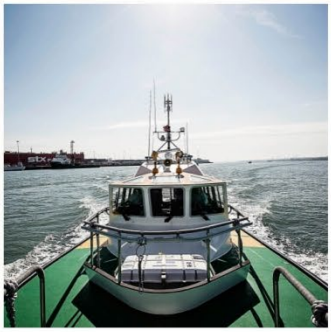
The Highland Council
Comhairle na Gàidhealtachd

Highland Council

Corran Ferry Infrastructure Improvement Scheme

Navigational Risk Assessment

December 2024



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Corran Ferry Infrastructure Improvement Scheme

Navigational Risk Assessment

December 2024

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Executive Summary

This Navigational Risk Assessment has been produced to support a Marine Licence application for the proposed development of the Corran Ferry Infrastructure Improvement Scheme improving the Corran Ferry Infrastructure at Nether Lochaber and Ardour. The NRA has been conducted by ABPmer for The Highland Council (THC), identifying the hazards to navigation and marine operations including an assessment of the associated risks for the construction and operational phase, in accordance with the latest editions of the Port Marine Safety Code and its Guide to Good Practice.

The Navigational Risk Assessment presents a baseline that includes marine traffic information alongside marine incidents, collated from the Marine Accident Investigation Branch and the Royal National Lifeboat Institute. The baseline information in the NRA provided context to the Hazard Identification (HAZID) workshop and subsequent risk analysis.

This assessment has considered 16 hazard scenarios for the construction phase and 7 hazard scenarios for the operational phase. After consideration of the 'worst credible' and 'most likely' hazard scenario descriptions; the causes and current controls have been assessed and the associated risk scores at the current stage (i.e., if the activities were to occur with no further controls applied). This was then conducted for the perceived reductions in risk with the application of the potential future risk controls to enable the THC to review the risk profiles against the controls that are recommended to be put in place.

Of the 23 hazards considered, 5 were assessed to be 'intolerable' currently without mitigation the remainder being tolerable with the current controls in place. With the application of the potential future controls these 5 hazards were assessed to be tolerable with the risk reduced to a point considered to be 'As Low As Reasonably Practicable' (ALARP). It should also be noted that all 23 hazard scenarios were assessed to be both tolerable and ALARP through the implementation of future risk controls identified in this Navigational Risk Assessment.

There is always potential for hazard risk frequency or consequence to change over time. Therefore, it is recommended that THC continues to monitor these marine and navigational risks going forwards and incorporate them into their ferry and marine facility safety management systems.

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1 Introduction

1.1 About the Local Authority

The Highland Council (THC) is a local authority in the north of Scotland, responsible for governing the Highland area, which encompasses large rural regions, coastal areas and islands. As marine asset owners at Nether Lochaber and Ardgour, the Council plays a vital role in managing the lifeline ferry service across Loch Linnhe. The Council's stewardship of the assets is crucial for the local economy, facilitating maritime activities and providing access to remote communities. Their responsibilities also extend to ensuring environmental protection and sustainable development within these coastal areas, highlighting their role in balancing economic interests with ecological preservation.

1.1.1 Governance and Management

The wider Loch Linnhe and the proposed development site does not fall within a Statutory Harbour Area (SHA). The closest SHA is Fort William located 7.3 nautical miles (nm) to the North East. THC is the owner of the two marine facilities to be redeveloped. The Maritime and Coastguard Agency (MCA) is therefore the competent authority with responsibilities for marine safety in the proposed development area.

1.1.2 Leisure and Recreational Facilities

Several yacht clubs are present in the study area (see Figure 1), including Lochaber Yacht Club, Thomas Telford Corpach Marina and Glencoe Boat Club. Lochaber Yacht Club and Thomas Telford Corpach Marina are situated at the northern end of Loch Linnhe, while Glencoe Boat Club is located in Loch Leven. All these clubs are located at a considerable distance from the proposed development site.

1.1.3 Commercial Operations

The port of Fort William is a key commercial hub, primarily supporting the transport of bulk goods such as timber, fish products, and construction materials vital to the local economy. It also plays an important role in aquaculture, handling seafood exports, and serves the tourism industry by hosting cruises and charters exploring the West Coast. There are also a number of fish farms within Loch Linnhe which are operated by Mowi Scotland Limited.

1.2 Project background

The Corran Ferry Infrastructure Improvement Scheme aims to modernise and enhance the vital ferry link across the Corran Narrows (connecting Nether Lochaber and Ardgour). The project will upgrade shoreside infrastructure to ensure resilience, safety, and sustainability for this lifeline connection and enable the introduction of a new electric ferry. The existing Corran Ferry service is one of the busiest single-vessel routes in Europe and is operated by a single primary vessel (Motor Vessel (MV) Corran) with a relief vessel (the Maid of Glencoul) nearing the end of its service life.

The infrastructure upgrades will support the transition to a new electric vessel, accommodate increased vehicle demand, and integrate with other Roll-on/Roll-off (Ro-Ro) ferry routes in Scotland. The proposed Corran Ferry Infrastructure Improvement Scheme consists of landside and marine works at both Ardgour on the western shore of Loch Linnhe and Nether Lochaber on the eastern shore of Loch Linnhe. A full description of the works from a marine perspective is provided in Section 4.

A Scoping Report for the Corran Ferry Infrastructure Improvement Scheme was submitted to the Scottish Government in May 2024 (THC, 2024). The MCA provided a response stating their expectation that a Navigational Risk Assessment (NRA) would be undertaken to assess the impacts on navigation, specifically citing the Port Marine Safety Code (PMSC) and Guide to Good Practice (GtGP). The MCA also recommended that consultation occurred through a Hazard Identification (HAZID) workshop specifically naming Scottish Southern Energy Network. Following the receipt of the Scoping Opinion, THC commissioned ABPmer to conduct an NRA. This report is the output of that HAZID and NRA work, in support of the Corran Ferry Infrastructure Improvement Scheme.

1.3 Scope of this NRA

This NRA assesses the potential outcome of marine incidents resulting from the construction, marine operations, and navigation activities associated with the proposed Corran Ferry Infrastructure Improvement Scheme. To do so, the potential hazards of the proposed development have been considered in the following phases:

- Construction: vessel movements or marine platforms associated with the construction, including any dredging during development of infrastructure.
- Operation: change to the study area's vessel movements including any future maintenance dredging as a result of the proposed development.

The NRA follows the five stages identified in the Code's GtGP (DfT, 2018) and is further detailed in Section 2 of this document.

1.3.1 Study area

The proposed development is located either side of Loch Linnhe at Ardgour and Nether Lochaber. The area encompasses the area around the Corran Narrows and extends up to Fort William and down to Inversanda Bay. It also includes Ballachulish Bay, the study area is shown in Figure 1.

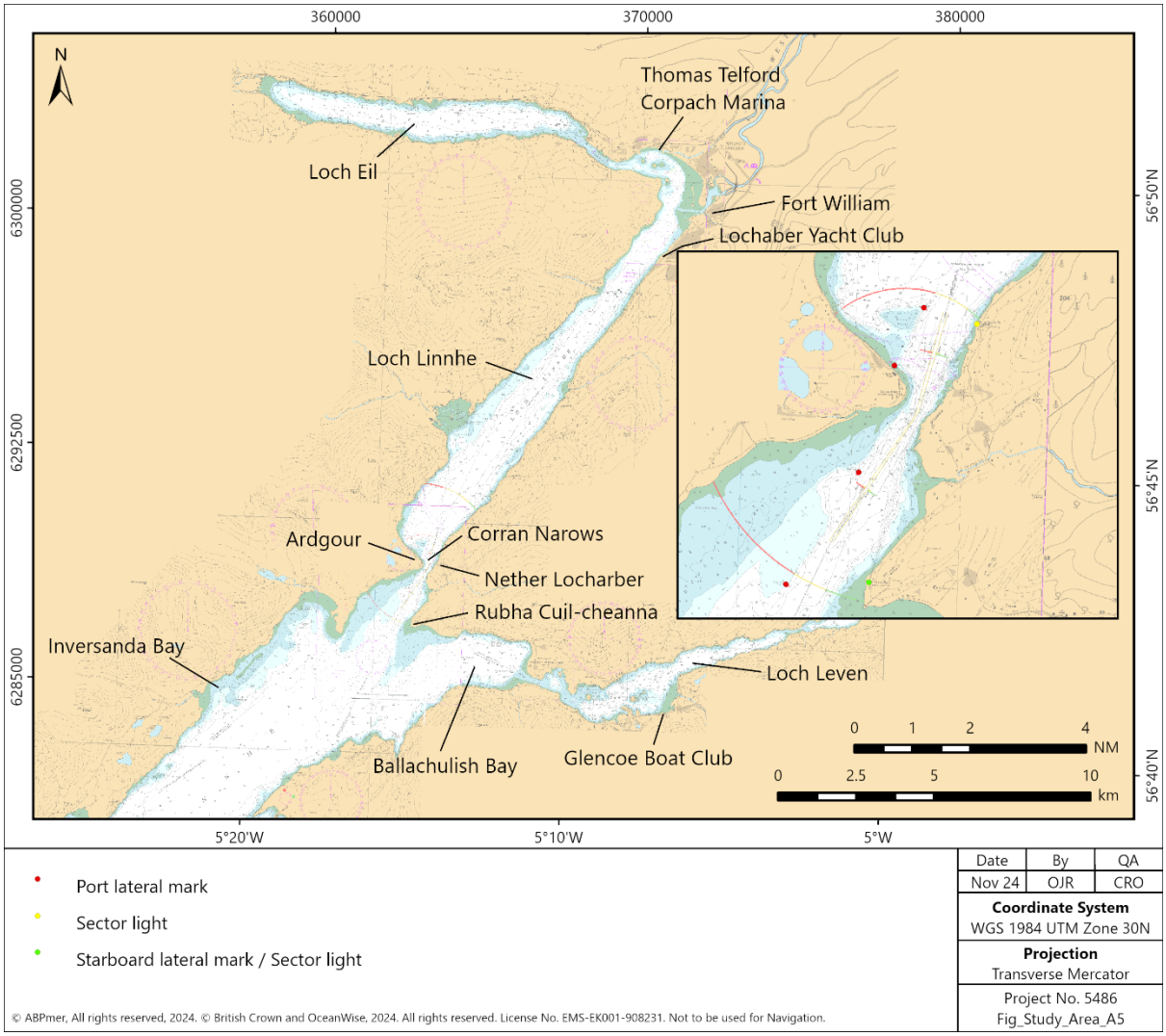

Figure 1. Study area

1.4 Policy and guidance

1.4.1 National standard for port marine safety

The UK national standard for safe and efficient port and maritime facility operation is the PMSC (DfT, 2016) and its accompanying guidance document GtGP (DfT, 2018). This NRA has been produced in compliance with the requirements of the Code and its GtGP. Additionally, principles from the International Maritime Organization (IMO) Revised Guidelines for Formal Safety Assessment (FSA) for use in the IMO rule making process (IMO, 2018) has provided supplementary information with regards to navigational risk. It should be noted that the IMO's FSA provides a wide range of guidance advice for marine activities, not all of which is applicable to the port marine context in the UK.

This NRA assesses navigational risk by utilising a matrix approach using the four base receptors identified in the PMSC (DfT, 2016) and Chapter 4 of the GtGP (DfT, 2018). These receptors include human life, the environment, port/port user operations and port/shipping infrastructure damage.

1.4.2 ALARP and tolerability principles

ALARP: The PMSC defines the term 'ALARP' as being 'as low as reasonably practicable', (DfT, 2016). ALARP is an industry-wide standard, applying to both health and safety and port marine safety.

Reasonably practicable: Central to this standard is the term 'reasonably practicable'. To meet this standard, the NRA balances risk against the effort, time and money required to control the risk. The PMSC (DfT, 2016) specifically references ALARP as an underpinning rationale for Marine Safety Management Systems (MSMS) and marine risk assessments.

Risk assessment is based on a comprehensive and formal assessment of hazards and risks with a view, following assessment and mitigation of the more severe scenarios either to eliminating the hazards and risks or to reducing them to the lowest possible state, as far as is reasonably practicable. Where a project is proposed which may alter the navigable environment, the promoter of the scheme should consult with those likely to be involved in or affected by such alterations, and responsible for managing the risks. The overriding aim is to ensure that any consequential risk is reduced to meet the standard of as low as reasonably practicable.

The Code's GtGP states that the:

> *"Judgement of risk should be an objective one, without being influenced by the financial position of the authority. The degree of risk in a particular activity or environment can, however, be balanced on the following terms against the time, trouble, cost, and physical difficulty of taking measures that avoid the risk. If these are so disproportionate to the risk that it would be unreasonable for the people concerned to incur them, they are not obliged to do so. The greater the risk, the more likely it is that it is reasonable to go to very substantial expense, trouble, and invention to reduce it. But if the consequences and the extent of a risk are small, insistence on great expense would not be considered reasonable"*

This means that every hazard scenario needs to be assessed and, regardless as to whether that scenario produces a minor or significant hazard, it needs to be taken into account so as to ensure that the risks overall are ALARP. Greater emphasis is placed on significant risks to ensure that the more significant risk outcomes are mitigated.

Tolerability: The concept of 'tolerability' seeks to define the point at which a risk has an unacceptable outcome (a function of frequency and consequence) when measured against key criteria. Those criteria in respect of marine safety are defined in the GtGP as:

- Human life;
- The environment;
- Port/port user operations; and
- Port/shipping infrastructure damage.

Further, the GtGP states that:

> *"Risks may be identified which are intolerable. Measures must be taken to eliminate these so far as is practicable. This generally requires whatever is technically possible in the light of current knowledge, which the person concerned had or ought to have had at the time. The cost, time and trouble involved are not to be taken into account in deciding what measures are possible to eliminate intolerable risk. Risks may be identified which are intolerable. Measures must be taken to eliminate these so far as is practicable. This generally requires whatever is technically possible in the light of current knowledge, which the person concerned had or ought to have had at the time. The cost, time and trouble involved are not to be taken into account in deciding what measures are possible to eliminate intolerable risk",*

Determining whether the predicted level of risk is acceptable requires a two-part test:

- Is the risk tolerable to the Organisation, and
- Is the risk mitigated to an 'ALARP' state.

This means that where risks are identified and assessed as being tolerable, they can be accepted, and the associated activity may proceed once a position of ALARP has been reached. However, if the assessed risk remains above the tolerability line or position, then all relevant controls must be applied to it or else the given activity cannot take place. Determining the risk tolerability, with respect to the proposed development is the obligation of the THC as the marine facility owner and operator.

2 Navigational Risk Assessment Approach

This NRA has been undertaken to assess the marine risks associated with the proposed Corran Ferry Infrastructure Improvement Scheme. The NRA process follows the requirements from the PMSC (DfT, 2016) and the guidance from the associated GtGP (DfT, 2018).

The following identifies the stages used in the NRA process, as defined in the GtGP, Section 4.3.3:

1. **Data gathering**: the NRA has been informed by data gathering and anecdotal vessel traffic analysis.
2. **Hazard identification**: identification of potential marine hazard scenarios, describing hazard descriptions and outcomes, was carried out as a workshop with stakeholders.
3. **Risk analysis**: determination of frequency and consequence for each hazard scenario as well as the overall assessment of risk outcomes and determining their prioritisation.
4. **Assessment of risk controls**: consideration of current controls, which either reduce the frequency or mitigate the consequence (severity) or both. Followed by consideration of potential future controls, which are not currently in place or may be in place but are not currently used to their full effect.
5. **Recommendation for future risk controls**: final decisions in determining risk mitigation needs to be made by the appropriate organisation, which in the case of the proposed development is THC as the ferry operator; and in its role as the marine infrastructure owner and operator.

The following Section 2.1 to 2.5 describe how the above five stages were applied in the project.

2.1 Data gathering and vessel traffic analysis

To inform the NRA, marine traffic information was collected from AIS data which represents two weeks in the summer (busy period) and two weeks in the winter (quiet period) providing routeing information about use by vessel traffic in the study area. Marine accident and incident records were also sourced from the Marine Accident Investigation Branch (MAIB), and the Royal National Lifeboat Institute (RNLI). Additionally, data from the Royal Yachting Association (RYA) coastal Atlas of Recreational Boating. Incident data has been presented in tabular and figure format in the Navigation Baseline (Section 3). Information relating to incidents that have occurred in the past provide valuable input to the hazard identification and risk assessment process.

2.2 Hazard Identification

Using information from stage 1 of the process (data gathering) and knowledge of the proposed works, ABPmer held an internal project discussion to consider what the potential risks associated with the project might be (the minutes of this meeting are held at Appendix A). From this meeting, nine hazard categories were identified as detailed in Table 1. These categories were all considered to be relevant in the context of the Corran Ferry Infrastructure Improvement Scheme.

The category descriptions are taken from Annex 1, Sub-Annex H, of the Marine Guidance Note (MGN) number 654 (MCA, 2023). These hazard categories were made available to the HAZID workshop attendees (see Appendix B).

Table 1. Hazard Category Descriptions

Hazard Category	Descriptors
Accident to person(s)	An accident to person(s) refers to any incident where an individual is injured or harmed while onboard or in proximity to the vessel. This can include falls, slips, trips, or any physical trauma resulting from activities or hazards associated with vessel operations
Collision	Collision is defined as a vessel striking, or being struck, by another vessel, regardless of whether either vessel is under way, anchored or moored; but excludes hitting underwater wrecks.
Contact/ Allision	Contact is defined as a vessel striking, or being struck, by an external object that is not another vessel or the sea bottom. Sometimes referred to as Impact. Allision is defined as a violent 'contact' between a vessel and a fixed structure.
Fire/ Explosion	Fire is defined as the uncontrolled process of combustion characterised by heat, smoke, or flame. An explosion is defined as an uncontrolled release of energy which causes pressure discontinuity or blast wave.
Flooding	Flooding is defined as an uncontrolled influx of water into a vessel, which may compromise its stability, buoyancy, or structural integrity. This can occur due to hull breaches, extreme weather, equipment failure, or collisions, and it poses a significant risk of sinking or capsizing
Grounding/ Stranding	Grounding is defined as the ship coming to rest on, or riding across underwater features or objects, but where the vessel can be freed from the obstruction by lightening and/ or assistance from another vessel (e.g., tug) or by floating off on the next tide. Stranding is defined as being a greater hazard than grounding and is defined as the ship becoming fixed on an underwater feature or object such that the vessel cannot readily be moved by lightening, floating off or with assistance from other vessels (e.g., tugs).
Hazardous Substances	Hazardous substance accidents are defined as any substance which, if generated as a result of a fire, accidental release, human error, failure of process equipment, loss of containment, or overheating of electrical equipment; can cause impairment of the health or damage to the vessel. These materials may be toxic or flammable gases, vapours, liquids, dust, or solid substances.
Payload related Incident	A payload-related incident involves hazards associated with the cargo or load the vessel is carrying. This can include spillage, shifting of cargo, or overloading of the cargo that may lead to environmental contamination, instability, or other risks to vessel safety.
Other	Other hazards refer to any incidents not covered by specific categories but may still pose risks to the vessel, crew, or environment. This could include unforeseen equipment malfunctions, navigational issues, or acts of vandalism.

During the pre-HAZID meeting, potential hazard scenarios were discussed and identified based on the expert opinion of the study team. The hazard scenarios were described in terms of their 'Most Likely' and 'Worst Credible' outcomes for Construction and Operational hazards. An initial set of hazards were drawn up for discussion at the HAZID with project and harbour stakeholders.

The use of 'Most Likely' and 'Worst Credible' outcomes allows very serious outcomes (i.e., worst credible) to be considered together with outcomes that are potentially less serious but could occur on a more frequent basis (i.e., most likely). This process matches the expectations of marine risk assessment as outlined in the GtGP, Section 4 (DfT, 2018).

During the pre-HAZID meeting a list of attendees were discussed from the Loch Linnhe stakeholder group as well as those identified in the scoping report. Table 2 lists all the organisations and individuals identified and invited to participate in the HAZID workshop.

Table 2 HAZID Invitiees

Organisation
Affric Ltd
Boyd Brothers Haulage (limited)
Cruise Loch Linnhe
Fort William Marina & Shoreline Community Interest Company
Lochaber
Maritime and Coastguard Agency (MCA)
MOWI
Northern Lighthouse Board
Oban Lifeboat Station Royal National Lifeboat Institution (RNLI)
Paddle Scotland
Royal Yachting Association (RYA)
Scottish Canals
Scottish Southern Energy Network
Subsea Testing and Evaluation (UK) Ltd
The Highland Council
The Outward-Bound Trust
Thomas Telford Corpach Marina
Wallace Stone LLP

The HAZID workshop with the stakeholders was held on 03 October 2024, Table 3 lists all stakeholders which responded to the invitation. The overall aim of the workshop was to consult with project and harbour stakeholders and collate views in the identification of navigational hazards potentially introduced by the proposed development. The workshop was facilitated by THC as the scheme promoter, engineering consultants and the study team from ABPmer. The HAZID explained the proposed scheme, the vessel(s) intended to use the route and included a review of navigation baseline data. Attendees were invited to review and input to the hazard scenarios, causes, current controls and to propose potential future controls. The minutes of this meeting are held at Appendix B.

Table 3. Hazard Identification workshop attendees

Attendee		Organisation
Harry Aitchison	HA	ABPmer
Megan Mardle	MM	ABPmer
Innes Beaton	IB	Affric Ltd
Calum Boyd	CB	Boyd Brothers Haulage (limited)
Sarah Kennedy	SK	Fort William Marina & Shoreline Community Interest Company
Mel Chisholm	MC	Scottish Southern Energy Network
Richard MacLeod	RM	Scottish Southern Energy Network
Lachie Innes	LI	Scottish Southern Energy Network
Robin Burnett	RB	Scottish Southern Energy Network
Reece MacKay	RM	The Highland Council
Richard Porteous	RP	The Highland Council
Steve Munro	SM	The Highland Council
Andrew Maciver	AM	The Highland Council
Murray Bain	MB	The Highland Council
Barry Purcell	BP	Wallace Stone LLP
Apologies		**Organisation**
Sandra Morgan	SM	Boyd Brothers Haulage (limited)
Helen Croxson	HC	MCA
Gillian Burns	GB	Northern Lighthouse Board
Calum McNicol	CM	Paddle Scotland
Paul Webster	PW	Scottish Southern Energy Network
John Maclellan	JM	Subsea Testing and Evaluation (UK) Ltd

The HAZID meeting concluded the set of Construction and Operational Hazard Scenarios as shown in Table 4 and Table 5. Additionally, the 'Worst Credible' and 'Most Likely' scenarios were discussed and agreed. The HAZID meeting also discussed potential causes and current risk controls. Any potential future controls that were identified were recorded. The minutes of this meeting are held at Appendix B. Following the workshop the output of the HAZID was circulated to all attendees and any organisations that had asked to be kept informed but were unable to attend the event (recorded in the apologies section of Table 3).

Table 4. Construction Hazards

ID	Category	Construction Hazard Scenarios
C.01	Accident to person(s)	Man overboard during dredge/construction works
C.02	Accident to person(s)	Diving operations associated with marine works
C.03	Allision	Dredge/construction plant impact with marine works
C.04	Allision	Recreational or fishing allision with marine works
C.05	Collision	Dredge/construction plant collision with rec vessel
C.06	Collision	Marine Works craft with ferry on swing mooring
C.07	Collision	Tug and tow collision with fishing/rec/aquaculture vessel
C.08	Collision	Dredger to and from disposal site
C.09	Fire/Explosion	Dredge/construction plant on-board fire
C.10	Flooding	Dredger flooding whilst engaged in operations
C.11	Grounding	Dredger grounding whilst engaged in operations
C.12	Hazardous sub.	Accidental spill during works
C.13	Other	Weather conditions leading to marine safety problem
C.14	Other	Contact with Subsea powerline, anchoring/dredging
C.15	Other	Strong Tidal currents – construction craft
C.16	Payload related	Incorrect payload distribution/stability affected by load

Table 5. Operation Hazards

ID	Hazard Category	Operation Hazard Scenarios
O.01	Accident to person(s)	Overnight berthing
O.02	Allision	Ferry boat allision with breakwater
O.03	Allision	Recreational/fishing vessel allision with marine works
O.04	Collison	Small non-powered craft displaced by breakwater/slipway/overnight pier
O.05	Collison	Ferry collides with other vessels
O.06	Grounding	Any vessel, post construction seabed change or debris
O.07	Grounding	Maintenance dredging incidents

2.3 Risk Analysis

Following the HAZID workshop the information provided by project and harbour stakeholders in the form of frequency and consequence selections for each individual hazard scenarios were used as risk analysis inputs. The descriptors used for this project are shown in Table 6 for frequency and Table 7 for consequence. In determining the current risk level, the initial risk analysis considers all current risk controls as being in place and working effectively.

Table 6. Frequency Descriptors

Rank	Descriptor	Frequency
1	The impact of the hazard is realised but should very rarely occur (within the lifetime of the entity)	1:100 yrs (1)
2	The impact of the hazard might occur but is unlikely (within the lifetime of the entity)	1:50 yrs (2)
3	The impact of the hazard could very well occur, but it also may not (within the lifetime of the entity)	1:25 yrs (3)
4	It is quite likely that the impact of the hazard will occur (within the lifetime of the entity)	1:10 yrs (4)
5	The impact of the hazard is almost certain to occur (within lifetime of entity)	> 1 per year (5)

The descriptors for consequence as shown in Table 7.

Table 7. Consequence Descriptors

Rank	Description	Definition			
		People	Property	Environment	Port (Business)
0	Negligible	No injury	Negligible (£0 - £10,000)	None (No incident - or a potential incident/near miss)	None
1	Minor	Minor injury(s)	Minor (£10,000 - £750,000)	No Measurable Impact (An incident or event occurred, but no discernible environmental impact - Tier 1 but no pollution control measures needed)	Minor (Little local publicity. Minor damage to reputation. Minor loss of revenue, £0 - £750,000)
2	Moderate	Serious injury(s) (MAIB/RIDDOR reportable injury)	Moderate (£750,000 - £4M)	Minor (Incident results in pollution with limited/local impact - Tier 1, Harbour Authority pollution control measures deployed)	Moderate (Negative local publicity. Moderate damage to reputation. Moderate loss of revenue, £750,000 - £4M)
3	Major	Single fatality	Serious (£4M - £8M)	Significant (Has the potential to cause significant damage and impact - Tier 2, pollution control measures from external organisations required)	Serious (Negative national publicity. Serious damage to reputation. Serious loss of revenue, £4M - £8M)
4	Extreme	Multiple fatalities	Major (> £8M)	Major (Potential to cause catastrophic and/or widespread damage - Tier 3, requires major external assistance)	Major (Negative national and international publicity. Major damage to reputation. Major loss of revenue, > £8M)

Risk was calculated for each risk receptor (people, property, environment, and business) based on the consequence outcomes and the frequency outcomes. The risk matrix shown in Table 8 was used to determine the outcome for each hazard scenario for the current risk with controls in place. The process was repeated with the potential future risk controls in place, on the assumption that all controls would be fully implemented and will work effectively.

Table 8. Risk Matrix Five-by-Five Grid

Frequency / Consequence	1:100 Years	1:50 Years	1:25 Years	1 – 10 Years	Yearly
Extreme	5	6	7	8	9
Major	4	5	6	7	8
Moderate	3	4	5	6	7
Minor	2	3	4	5	6
Negligible	0	0	0	0	0

This generated eight individual risk scores per hazard scenario. These summary risk score per hazard scenario was calculated using the following method:

- The average risk score with current controls in place; and
- The average risk score with potential future controls in place.

2.4 Assessment of risk controls

The hazard list in Section 5.4 displays the scores sorted in alphabetical order to produce a 'Hazard List'. The risk score associated with each of the hazard scenarios was then assessed against the tolerability matrices shown below in Table 9 to Table 12 for each receptor.

Table 9 People Tolerance

Consequence						
	Multiple Fatalities					
	Single Fatality					
	Serious Injury					
	Minor Injury					
	No Injury					
		1 in 100 years	1 in 50 years	1 in 25 years	1 in 10 years	Yearly or more frequent
		Frequency				

Table 10 Property Tolerance

Consequence						
	Major (> £8m)					
	Serious (£4m - £8m)					
	Moderate (£750,000 - £4m)					
	Minor (£0 - £750,000)					
	None					
		1 in 100 years	1 in 50 years	1 in 25 years	1 in 10 years	Yearly or more frequent
		Frequency				

Table 11 Environment Tolerance

Consequence						
	Tier 3					
	Tier 2					
	Tier 1					
	T1 no cleanup					
	None					
		1 in 100 years	1 in 50 years	1 in 25 years	1 in 10 years	Yearly or more frequent
		Frequency				

Table 12 Port Business Tolerance

Consequence						
	Major (> £8m)					
	Serious (£4m - £8m)					
	Moderate (£750,000 - £4m)					
	Minor (£0 - £750,000)					
	None					
		1 in 100 years	1 in 50 years	1 in 25 years	1 in 10 years	Yearly or more frequent
		Frequency				

2.5 Recommendations for risk controls

Following characterising each of the identified risks (taking into consideration the current risk controls), the potential for further reduction in the level of risk using potential future controls was evaluated. In this context, the THC (as facility owner) confirmed which of the potential future controls could be feasibly implemented. Where potential future controls were identified, consideration was given to the Code's guidance on Risk Control Hierarchy (DfT, 2018) which aims to:

- Eliminate risks: by avoiding a hazardous procedure or substituting a less dangerous one.
- Combat risks: by taking protective measures to prevent risk.
- Minimise risk: by suitable systems of working. If a range of procedures is available, the relative costs need to be weighed against the degree of control provided, in the short and long term.

Once these potential future controls were assigned to a hazard, the perceived consequence and frequency outcomes of hazard scenarios was re-evaluated. This was completed post-HAZID, Section 5. of this report details the resultant risk scores following this analysis. The Hazard Log in Appendix C and D outline key data regarding the hazards identified and can be used as a reference for THC when transferring the findings of this NRA into their own operational risk assessments. These along with the recommendations in Section 7 form the main findings of the NRA.

3 Navigation Baseline

3.1 Introduction

The following section presents the baseline information for commercial shipping, military, law enforcement, fishing vessels and recreational craft in the study area. Where relevant, factors relating to the proposed development and the subsequent operation have been highlighted. The following elements are considered in the baseline:

- Statutory responsibilities and management procedures;
- Vessel services;
- Aids to Navigation;
- MetOcean conditions;
- Marine traffic; and
- Marine incidents.

3.2 Statutory responsibilities and management procedures

The proposed development is not located within the SHA limits of any Harbour Authority. Vessels navigating the Lochs are subject to the normal rules and regulations that apply to vessels at sea and each vessel has the responsibility to navigate safely and avoid collisions. Outside of harbour limits, the MCA is the competent authority for marine safety. The marine facilities at Ardgour and Nether Lochaber are operated by THC under the requirements of the PMSC. THC is also the ferry owner and operator. To operate the ferry in a safe and compliant manner, THC use an integrated management system Ferry Marine Safety Management Systems.

3.3 Aids to navigation

As no local lighthouse authority is established, the General Lighthouse Authority (GLA) is responsible for the maintenance of navigational marks, this resides with the Northern Lighthouse Board (NLB). The aids to navigation located in the study area include:

- Four lateral port markers:
  - Two South of Corran Narrows
  - One north of Corran Narrows
  - One on Ardgour Pier
- Sector light at Corran Narrows.
- One lateral Starboard marker at Rubha Cuil-cheanna which also acts as a sector light for Corran Narrows.

3.4 MetOcean conditions

This section describes the wind, wave and tidal characteristic for the study area.

3.4.1 Wind

Figure 5 shows a wind rose diagram for the area immediately south of Loch Linnhe. It identifies that the wind is predominantly from the southwest, and to a marginally lesser extent from the west. The strongest winds of greater than 16 m/s (Beaufort Wind Force 7) are also predominantly from the south-

west, west and south occurring relatively infrequently. The local topography provides minimal shelter for winds from the southwest as Loch Linnhe is orientated in a southwest, northeast angle. The topography provides shelter from other wind directions.

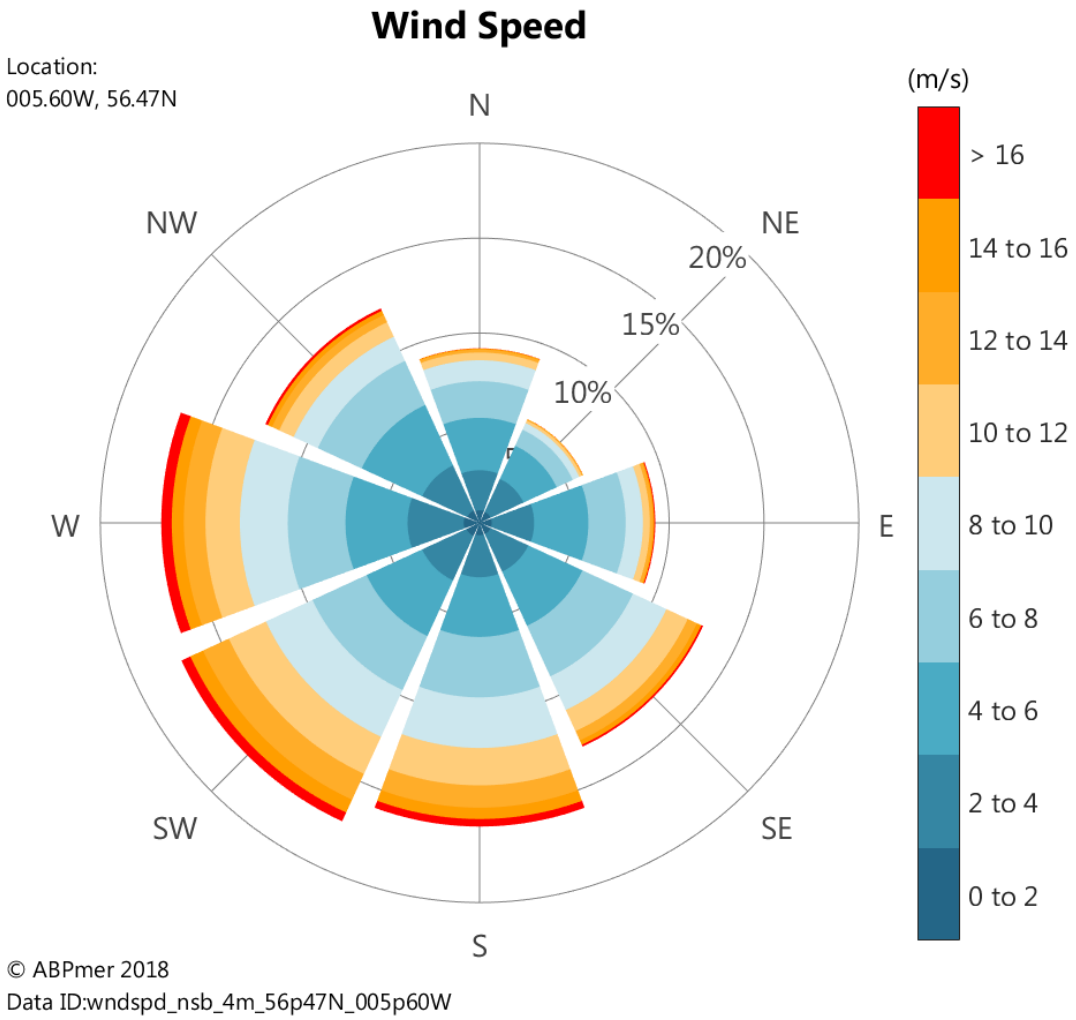

Figure 2 Wind rose for South Loch Linnhe

3.4.2 Tidal conditions

Within the Loch Linnhe system, the tidal range increases inland with the maximum range at Corran, where 3.7 m and 1.4 m are the spring and neap ranges respectively. The combination of the narrows and the large tidal range in this region produce fast currents. The maximum flood tidal speed at Corran is recorded as 4.9 m/s (9.5 knots). The maximum ebb tidal speed at Corran is recorded as 3.6 m/s (7.0 knots). Tidal flow can be altered by freshwater input, with the principal source of freshwater input from the Rivers Lochy and Nevis which flow into the head of the loch near Fort William (Taylor, 1997).

3.4.3 Wave conditions

The position of Mull at the mouth, means that the loch is protected from the wave action of the Atlantic, however the axis of Loch Linnhe lies along the direction of the prevailing wind. With the steeply sloping fjord like sided topographic features, the winds are channelled inland, thereby increasing wave action and wind driven water mixing (Taylor, 1997).

3.5 Marine traffic

This section analyses the vessel traffic routeing through the study area using 28 days of data, 14 days in the summer (15-29 July 2024) and 14 days in the winter (01-15 January 2024). Figure 3 to Figure 11 shows the AIS transits for the Study Area. Traffic density is presented in Figure 12 for winter and Figure 13 for Summer.

3.5.1 Recreational vessel movements

Figure 3 shows AIS transits for the recreational vessel movements through the study area in the Summer period, it should be noted that no recreational traffic was recorded in the winter period. Whilst it is acknowledged that a large proportion of recreational vessels do not use AIS, the information still provides an indication of the vessel routeing through the area. It can be seen from Figure 3 that recreational vessels tend to transit past the marine works close through the Corran Narrows with a small number of recreational vessels manoeuvring around the Corran Shoal to the West of the marine works site.

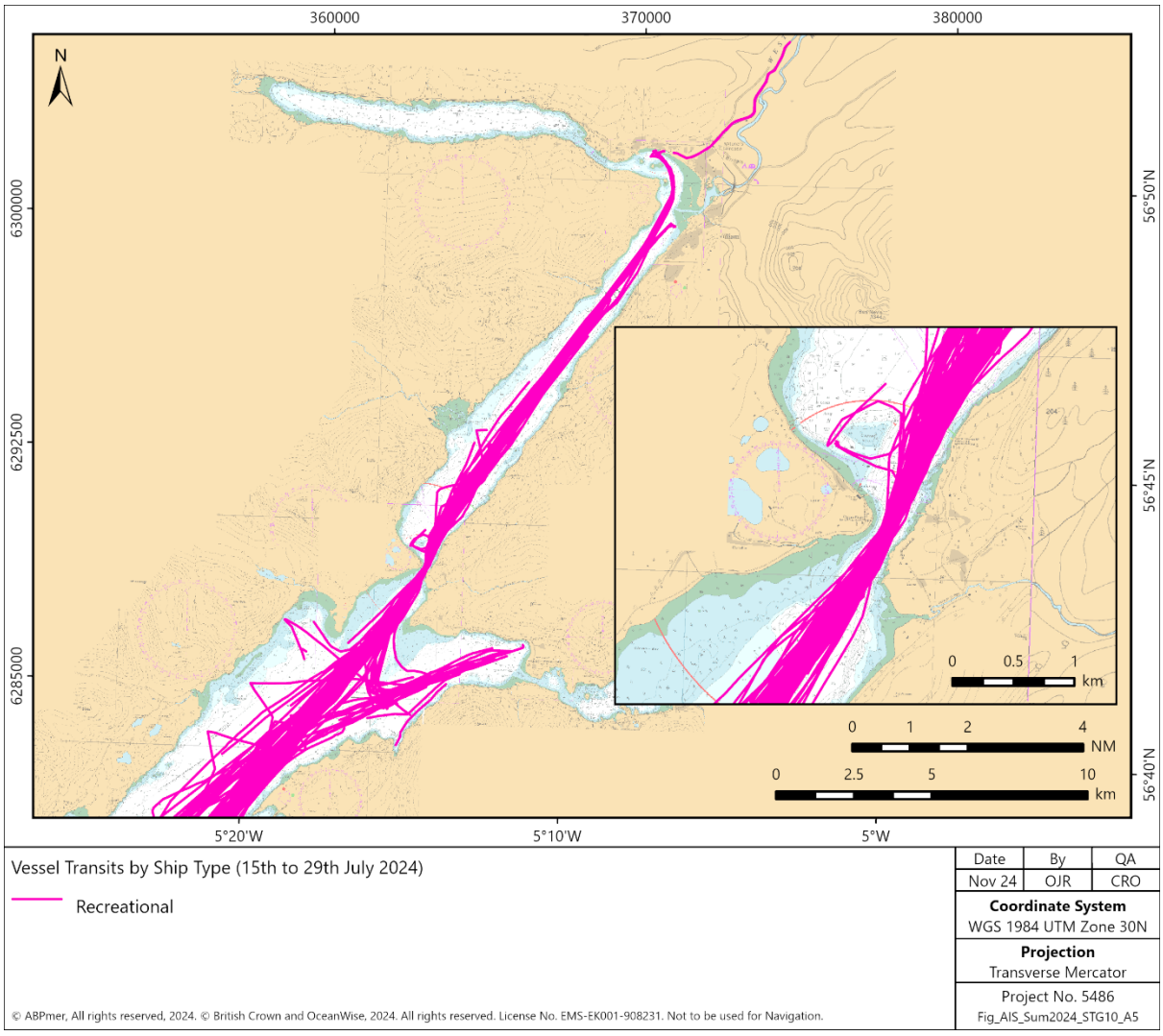

Figure 3. AIS Vessel Transits – Recreational Vessel (Summer period)

3.5.2 Passenger vessels and High Speed Craft

In the winter period (Figure 4) the majority of passenger vessel transits are between Nether Lochaber and Ardgour which aligns with the current Corran passenger ferry route, in addition one vessel can be seen entering Loch Linnhe and transiting half way up the northern section of Loch Linnhe at Fort William before stopping. In the summer period (Figure 5) there is considerably more passenger routes mostly in the northern section of Loch Linnhe, navigating from Fort William. A small number of vessel transits are observed navigating in Loch Eil. The passenger ferry activity between Nether Lochaber and Ardgour remains consistent in the winter months. A limited number of high speed craft can be observed in both the winter and summer periods (Figure 4 and Figure 5). In the winter period, these craft transit south of the Corran Narrows with a greater concentration of activity around Rubha Cuil-cheanna. In the summer period there are very few high speed craft transits south of the Corran Narrows navigating in Ballachulish Bay.

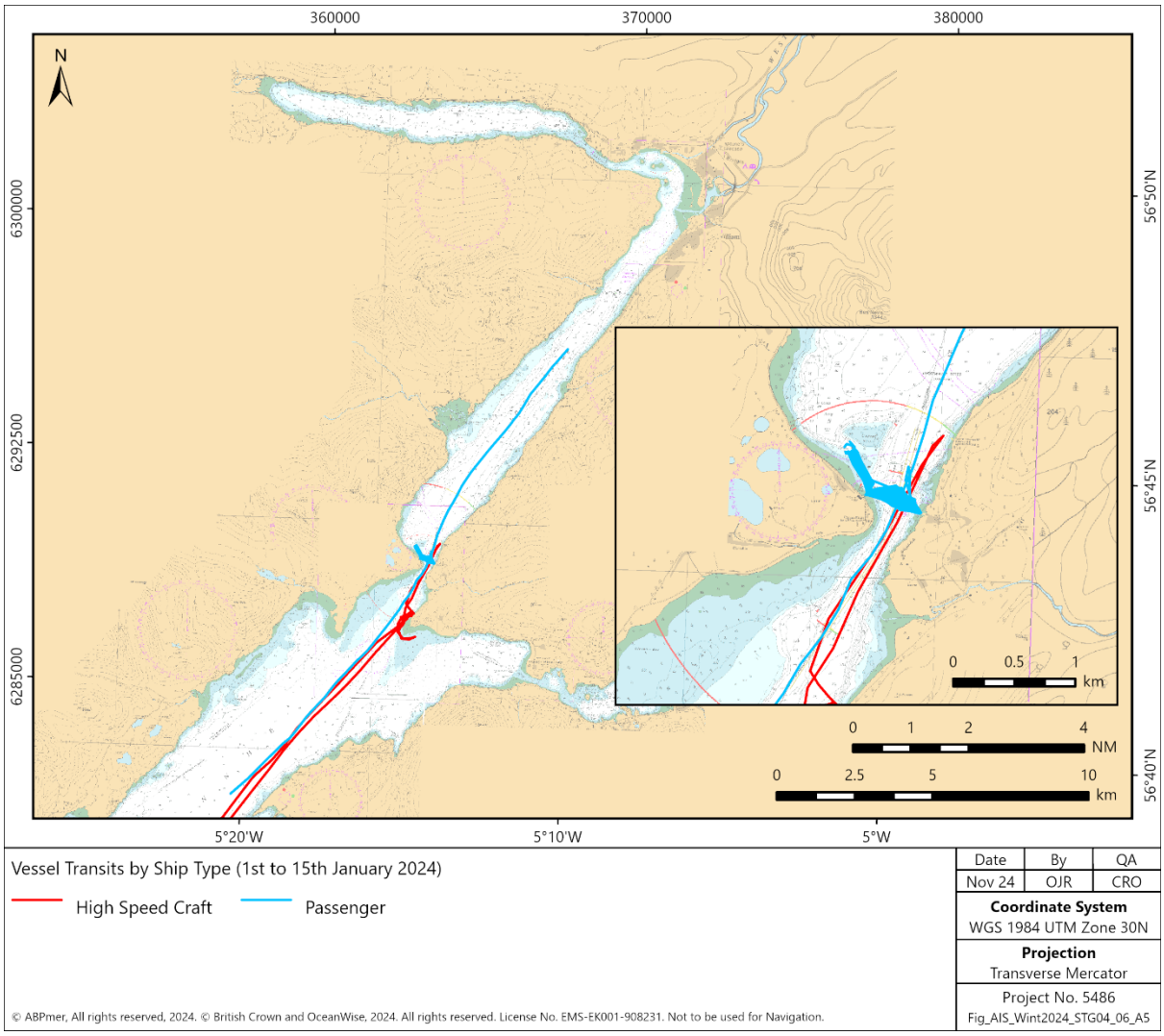

Figure 4. AIS Transits – Passenger Vessels and High Speed Craft (Winter period)

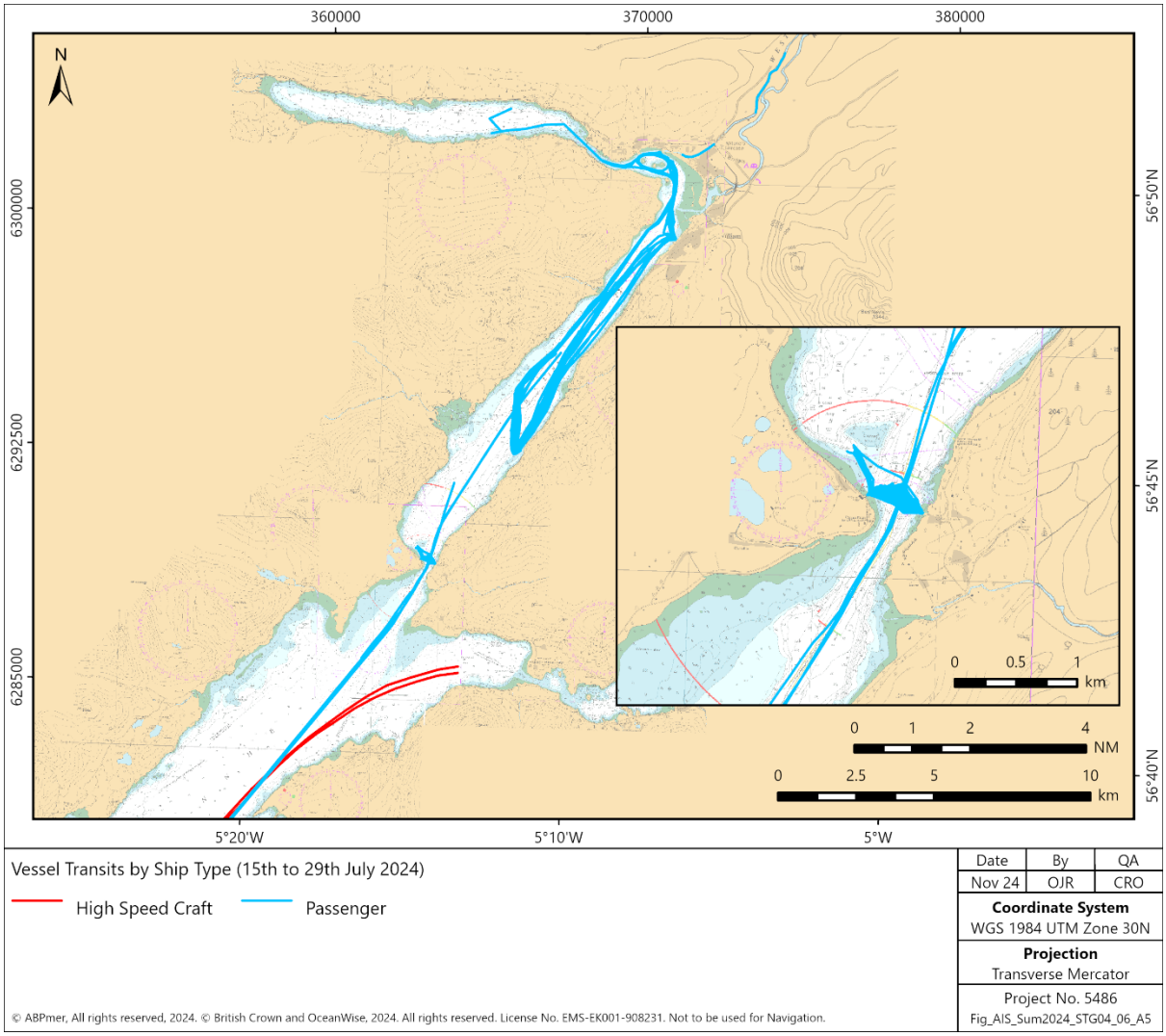

Figure 5 AIS Transits – Passenger Vessels and High Speed Craft (Summer period)

3.5.3 Fishing vessels

Fishing vessel activity is provided on Figure 6 and Figure 7 which depicts AIS vessel activity in the study area. It can be seen from the data that fishing vessel transit are through Loch Linnhe in both the summer and winter periods. In the winter period (Figure 6) the AIS transits are observed manoeuvring in the approach to the Corran Narrows. There is no requirement for fishing vessels less than 15 m length overall (LOA) to use AIS and it is known that there many other small day fishing and potting boats operating within the area.

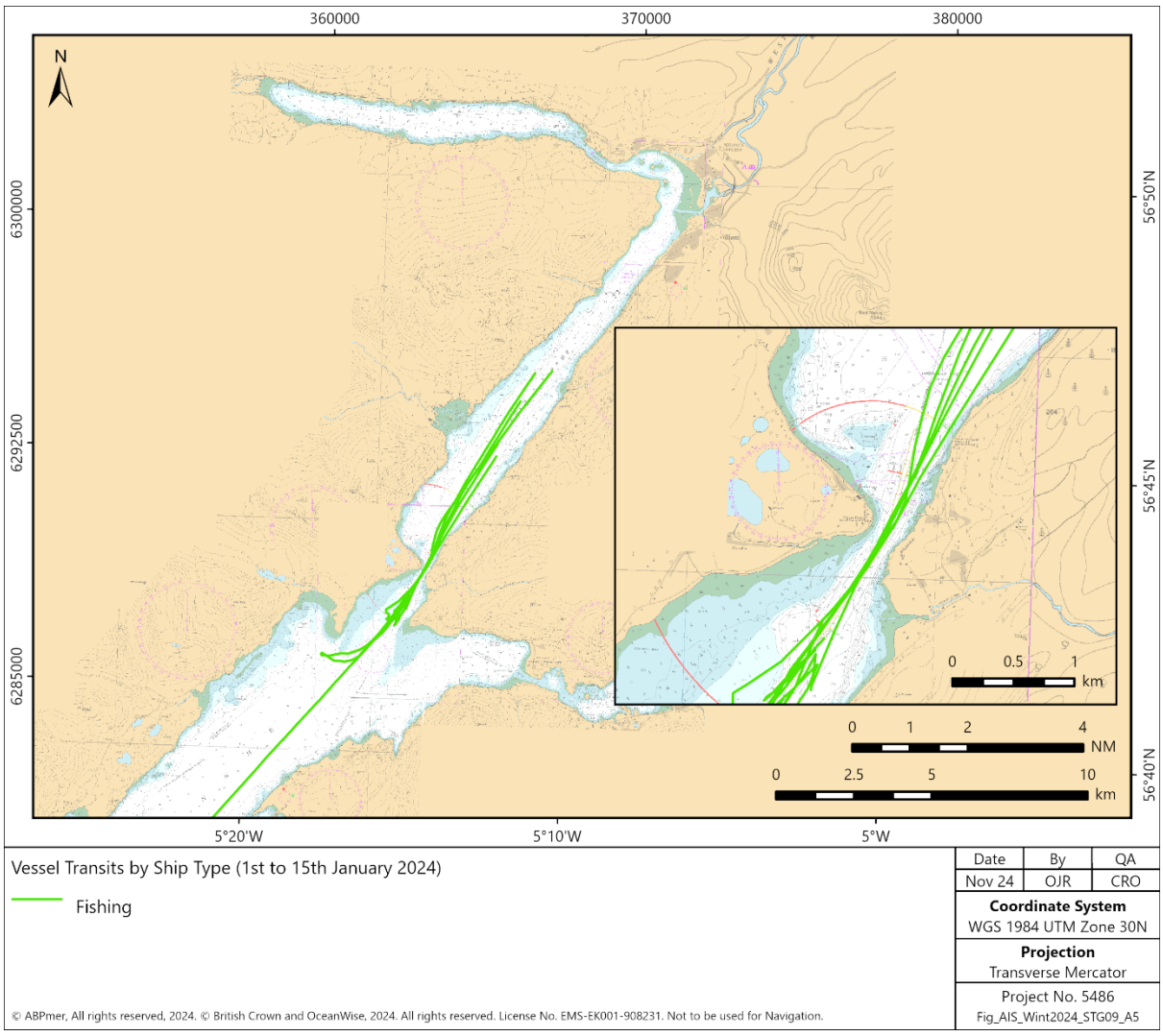

Figure 6. AIS Transits – Fishing Vessels (Winter period)

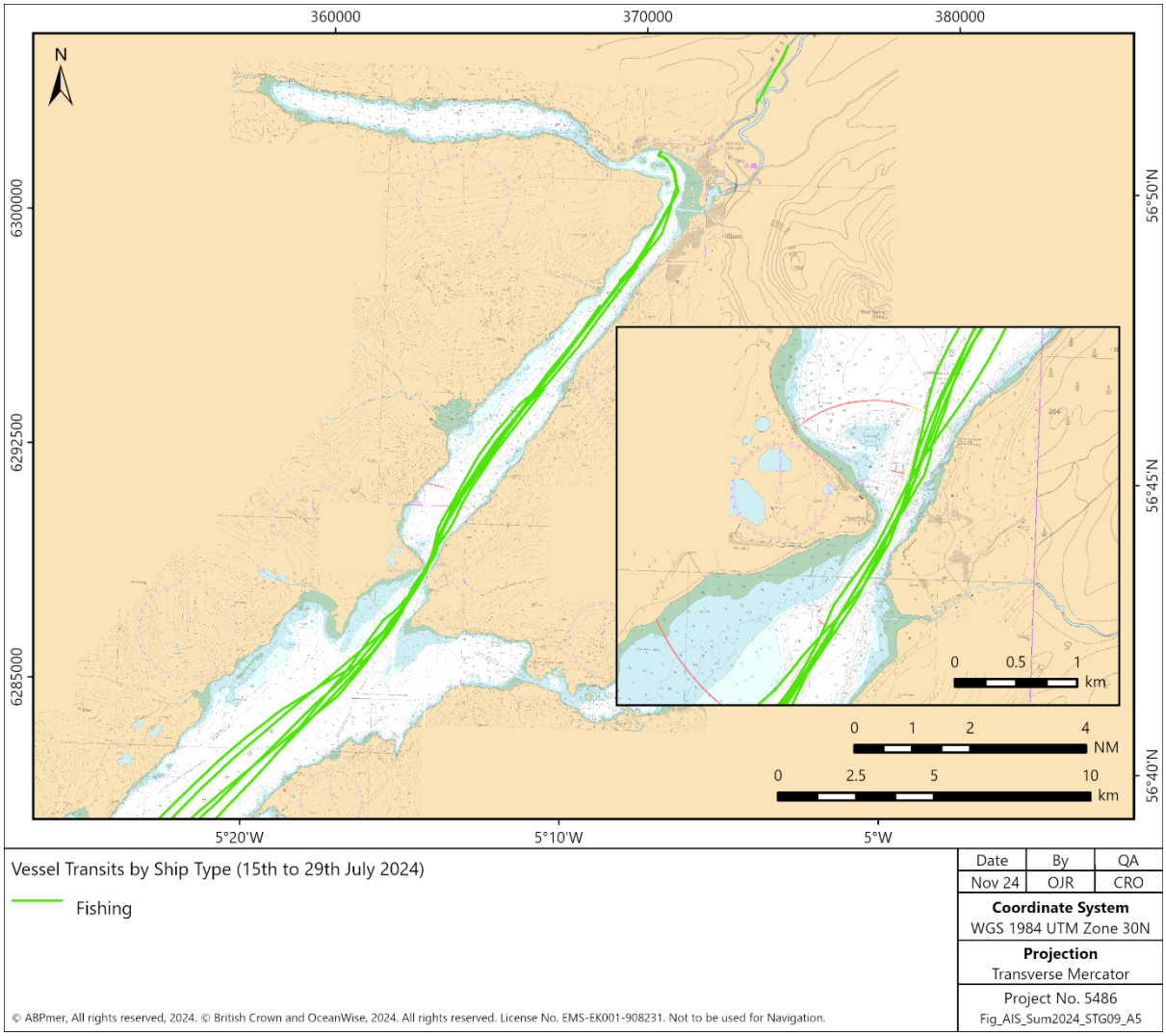

Figure 7 AIS Transits – Fishing Vessels (Summer period)

3.5.4 Unknown craft, Port Service, Non-Port Service and Military/Law Enforcement

Figure 8 and Figure 9 shows four vessel categorisations. In Figure 8 unknown craft[1], non-ports service craft and port service craft can all been seen transiting the similar areas within Loch Linnhe. Routes typically run up to Fort William and back to south of Loch Linnhe. One port service craft can be observed transiting to a Jetty at Gorsten. In the summer period (Figure 9) the majority of traffic recorded in the dataset is military or law enforcement craft. These vessel tracks are observed to be transiting Loch Linnhe to Fort William and Corpach in the North of Loch Linnhe. South of the Corrana Narrows these vessels are seen to be manoeuvring along the south coast of Loch Linnhe. A small number of unknown craft and port service craft are also seen within the summer period manoeuvring south of the Corran Narrows and around Fort William.

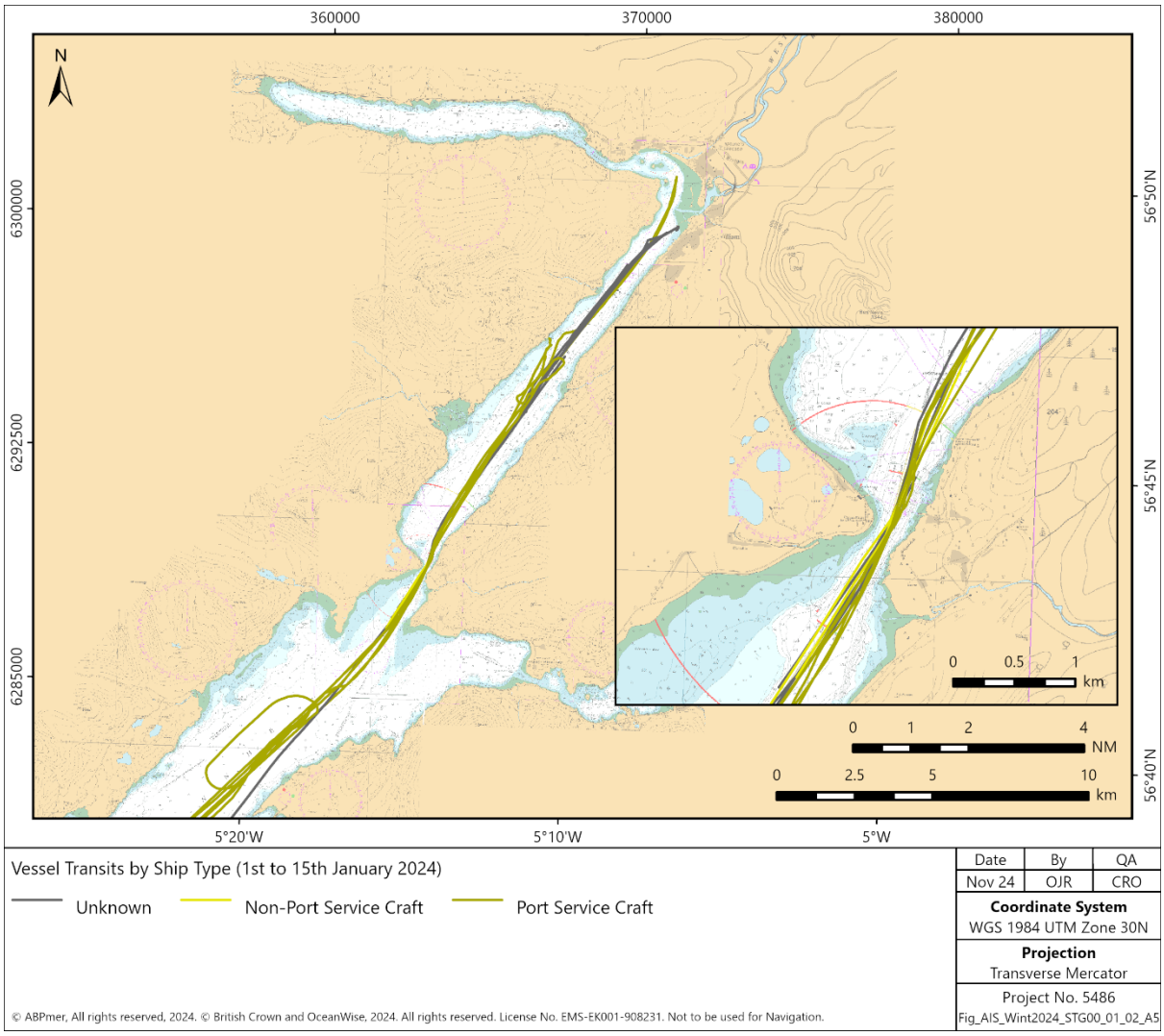

Figure 8 AIS Transits – Unknown, Non-Port Service Craft and Port Service Craft (Winter period)

[1] AIS Craft Type 'Unknow' are vessels that have not set their AIS transmitters with an identification code for their vessel type.

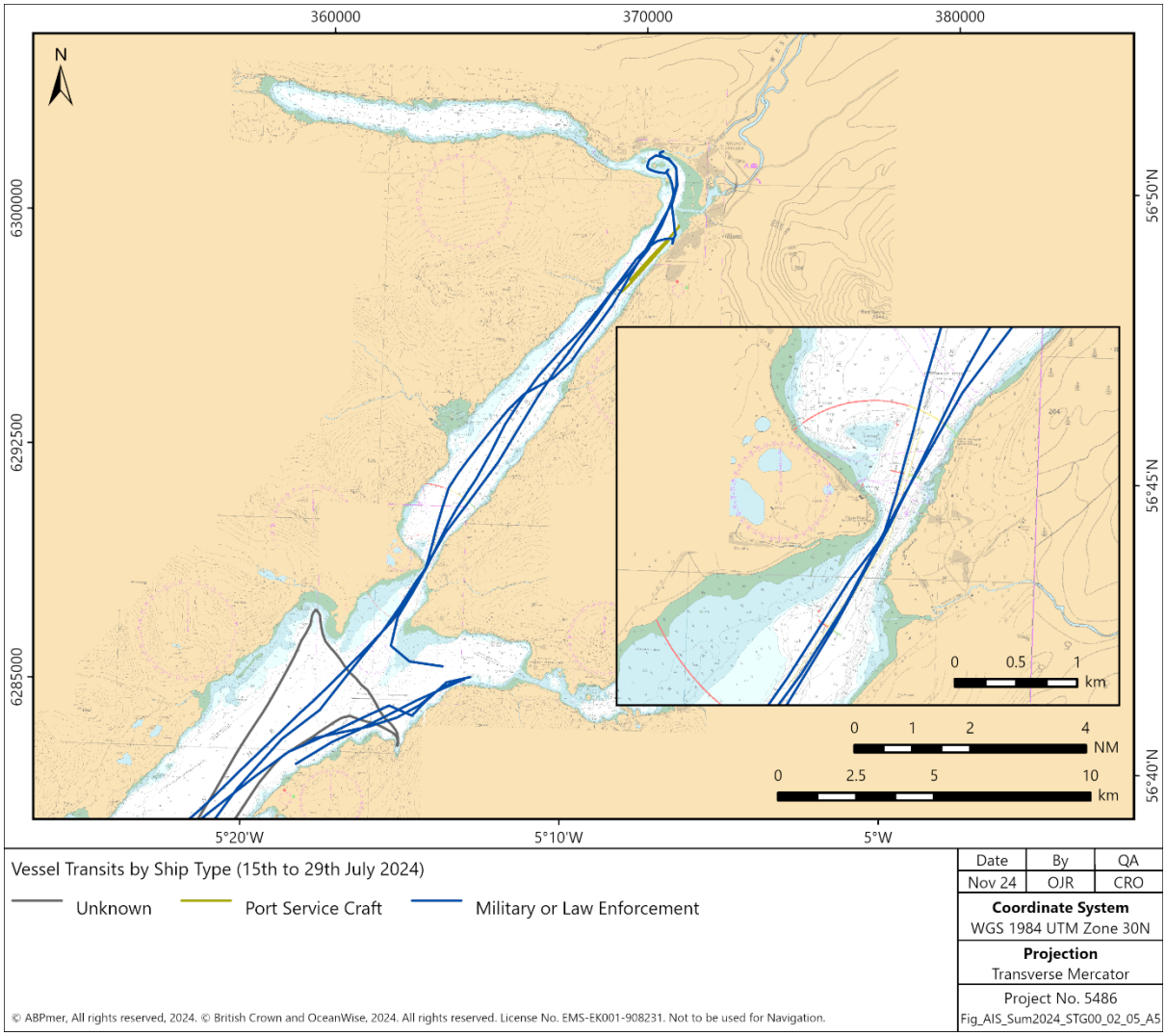

Figure 9 **AIS Transits – Unknown, Port Service Craft and Military/Law Enforcement (Summer period)**

3.5.5 Cargo vessels

There are a small number of movements made by cargo vessels in Loch Linnhe. The tracks shown in Figure 10 and Figure 11 indicate that most of the transits were passing through the Loch bound for, or departing from Fort William. In the summer period one transit is observed navigating into Loch Leven (Figure 11).

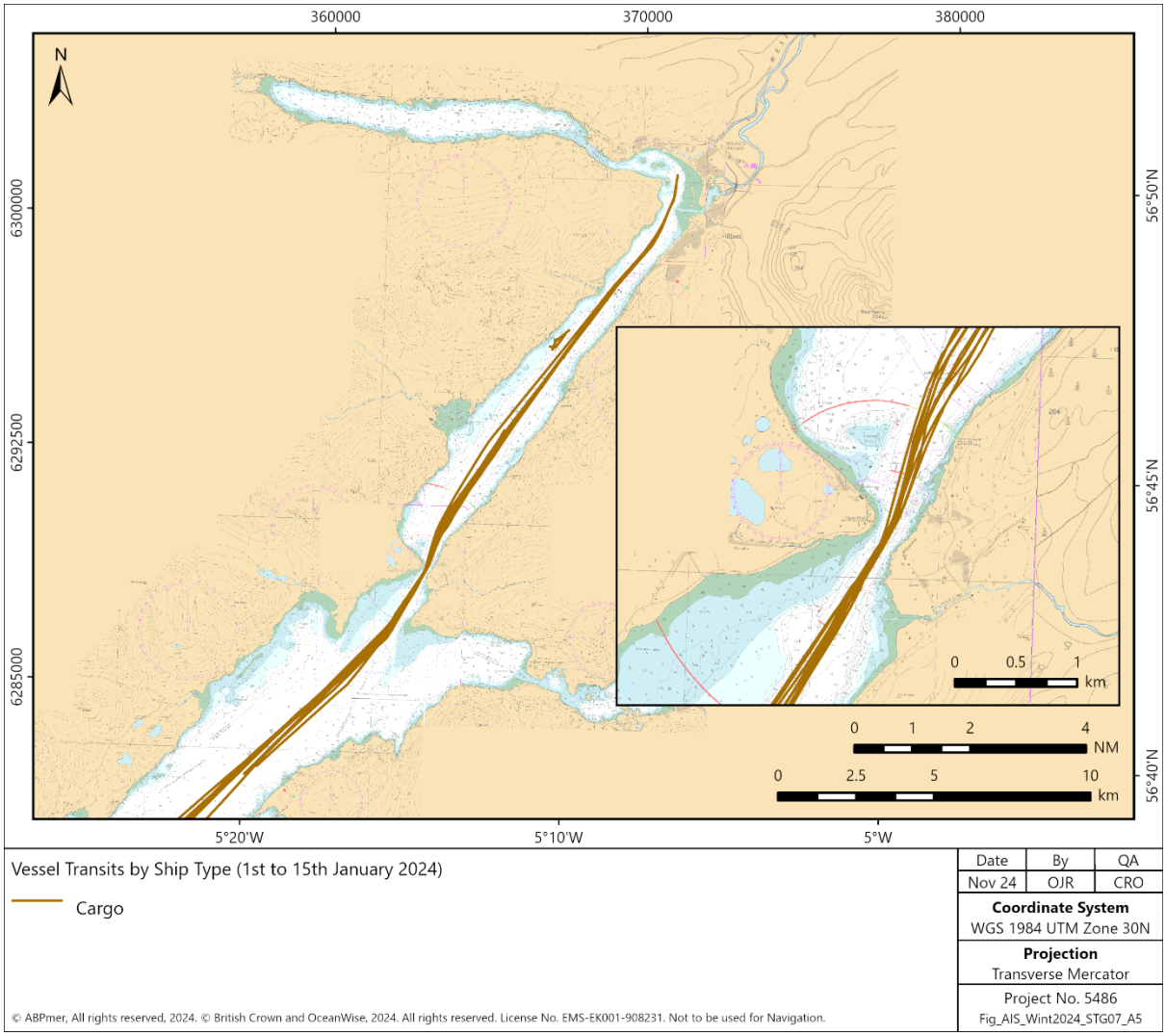

Figure 10 AIS Transits – Cargo vessels (Winter period)

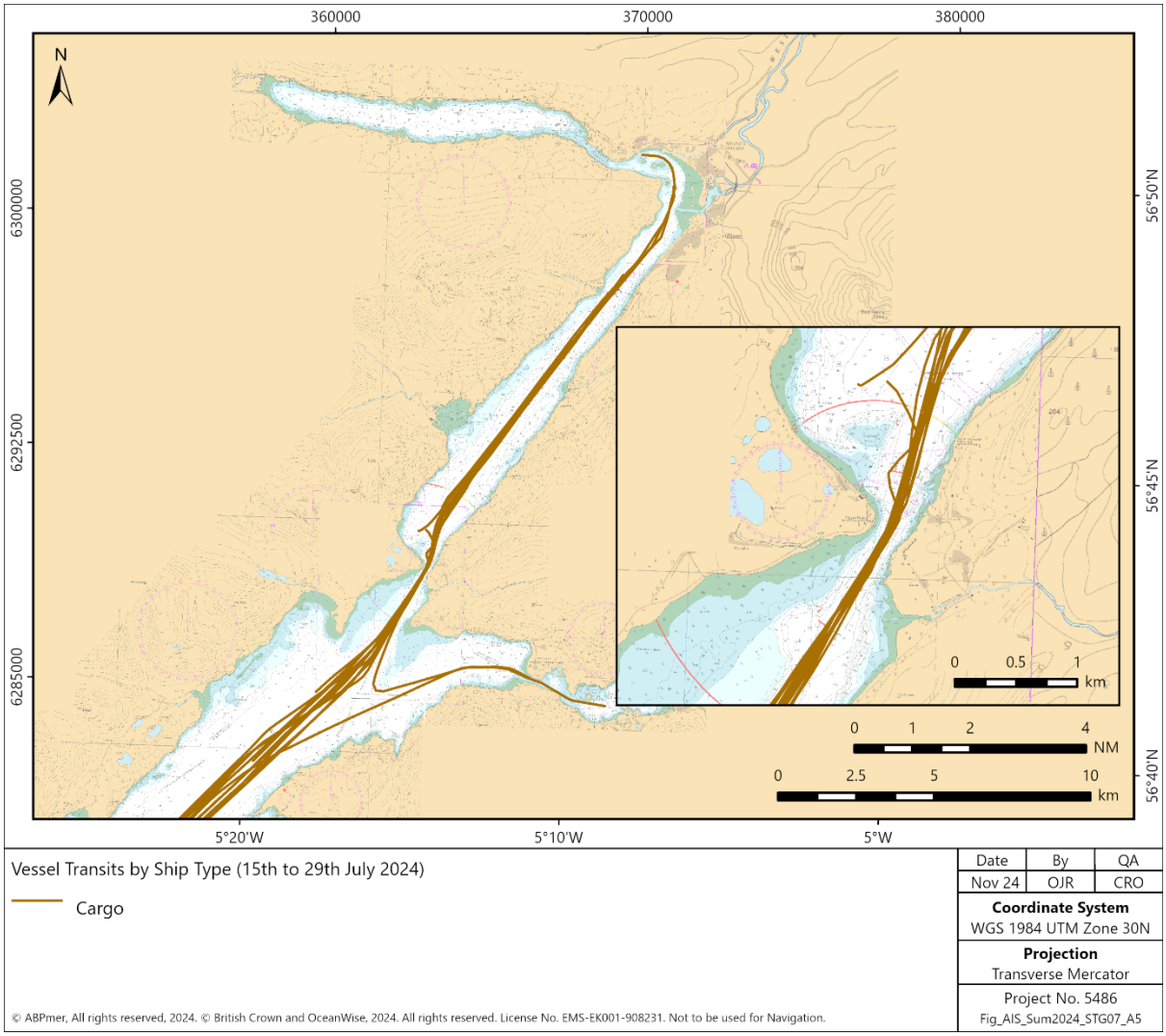

Figure 11 AIS Transits – Cargo vessels (Summer period)

3.6 Traffic density

Vessel density is shown in Figure 12 and Figure 13 which identifies the areas with highest vessel activity within the study area. The cell size for the density is made up of Hexagon grids with a short diagonal edge of 10 m, each grid covers an 86.6 m^2 area. The data collection period is 15 days, with the greatest density for the winter period being 569 transits, or 38 transits per day in the winter period in any area coloured dark blue.

Figure 12 and Figure 13 shows a high-density of traffic crossing the Corran Ferry route in both the winter and summer periods. This is consistent with the ferry transits between these two locations. Also, within both periods the through traffic of the Corran Narrows presents as the next busiest area as vessel traffic is confined in its transit route through this section of Loch Linnhe.

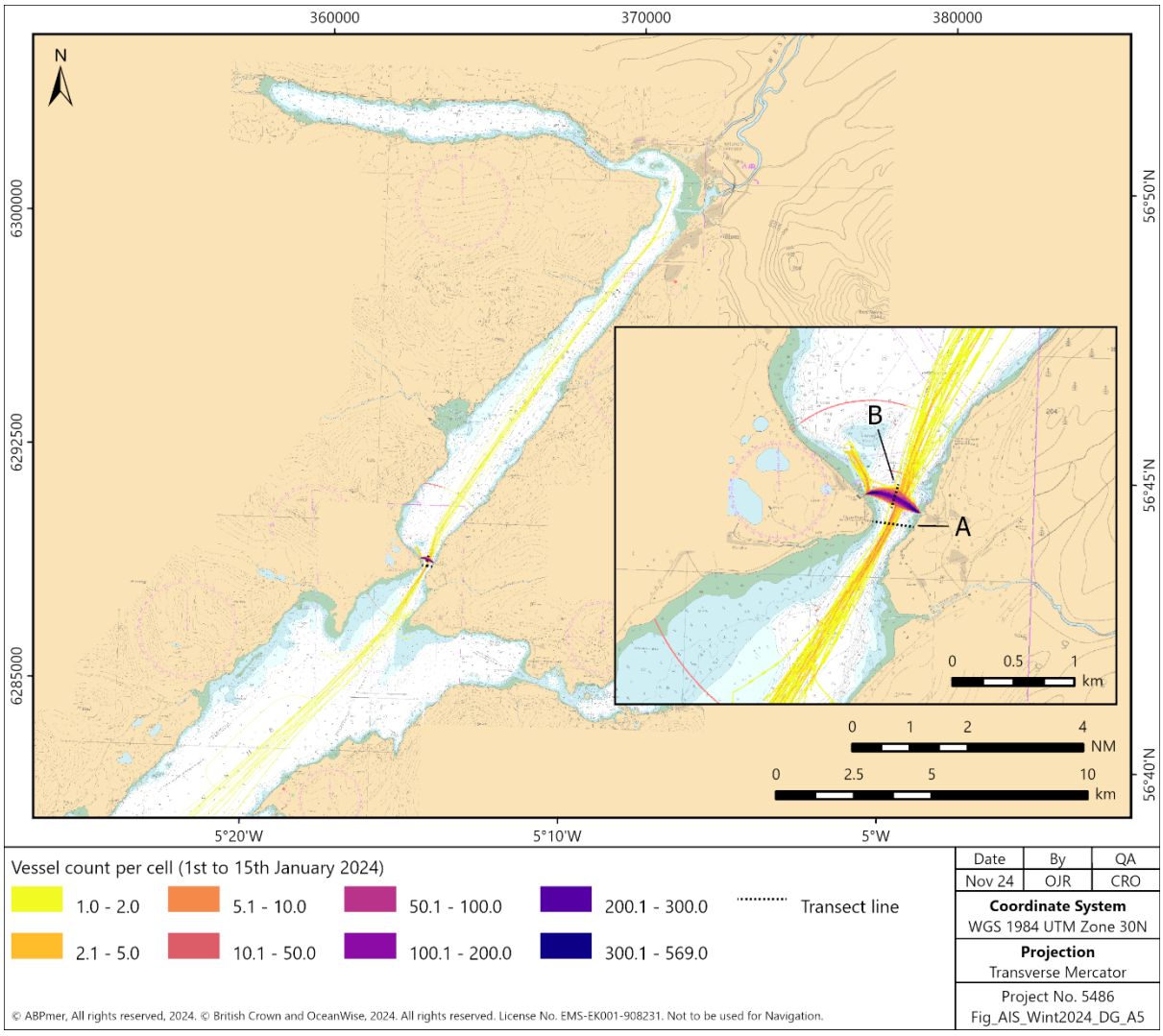

Figure 12. Vessel Density per cell (Winter period)

The Summer period vessel density identifies that there is increased vessel traffic throughout the whole study area with particularly more intensity through the Corran Narrows, around Fort William and the northern section of Loch Linnhe, north of the Corran Narrows. For the summer period the peak transit count is 625, or 41.6 transits per day in any area coloured dark blue.

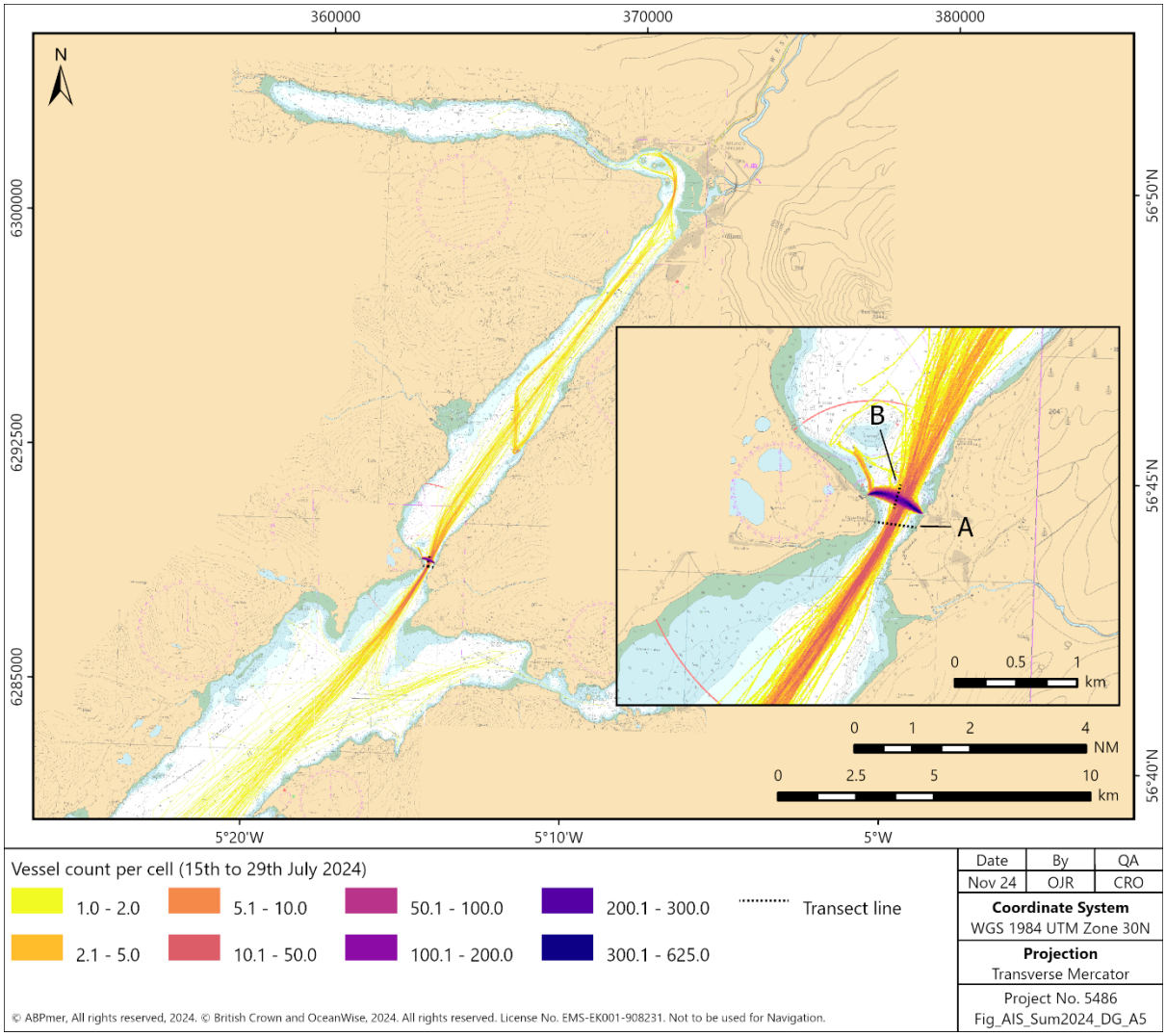

Figure 13. Vessel Density per cell (Summer period)

3.6.1 Vessel composition analysis

Vessel density indicates areas and routes with the greatest number of vessel movement. Where two areas or routes of dense vessel traffic meet a greater amount of vessel interaction can be expected. Vessel interaction through volume of numbers or the nature of the traffic flow increases levels of risk and may result in slower transit times. Transects have been drawn to allow the vessel transits through specific parts of the study area to be quantified. The transects are shown in Figure 12 and Figure 13.

Table 13 and Table 14 details the number of vessel transits per AIS group corresponding to the transect lines identified on Figure 12 and Figure 13. Table 13 identifies that the majority of vessel transits crossing transect line A which runs across the Corran Narrows counting all through traffic. This has identified the majority of traffic passing the Corran Narrows are recreational craft with all of them being recorded in the summer period (a count of 112, or 69%). The next most predominant vessel type operating in that area were Cargo with 21 transits through the summer period (12) and winter period (9).

Table 14 identifies that a total of 1,839 vessels crossing from Ardgour to Nether Lochaber. Transect line B positioned vertically in the Corran Narrows as shown on Figure 12 and Figure 13 measures all traffic transiting across the narrows during the data periods.

Table 13. Transect A, Corran Narrows

Ship Type	Corran Narrows Transit Line Count (Summer period)	Corran Narrows Transit Line Count (Winter period)	Transit Count Total
Non-Port Service Craft	-	2	2
Port Service Craft	-	5	5
High Speed Craft	-	1	1
Passenger	3	-	3
Cargo	12	9	21
Fishing	6	5	11
Military or Law Enforcement	3	-	3
Recreational	112	-	112
Unknown Vessels	-	3	3
Total	**136**	**25**	**161**

All of these 1,839 vessels were passenger vessels, which are equally split between summer period and winter period identifying the same activity through seasonal variation as opposed to the traffic transiting through the Corran Narrows which is predominantly active in the summer period.

Table 14. Transect B, Ferry Route

Ship Type	Corran Narrows Transit Line Count (Summer period)	Corran Narrows Transit Line Count (Winter period)	Transit Count Total
Passenger	1,009	830	1,839
Total	**1,009**	**830**	**1,839**

3.7 Marine incidents

This section analyses the marine incidents that have been reported in the study area over a 14-year period, drawn from MAIB and RNLI datasets. The reported incidents have been mapped onto a study area chart and colour coded to help identify areas where certain incidents are more likely to occur (see Figure 14 and Figure 15).

Table 15 presents MAIB incident records and the location of MAIB accident/incident reports are shown in Figure 14. It identifies that there were 15 incidents between 2010 and 2023. This equates to an average annual frequency of 1.07 reportable MAIB incidents per year. Harbour Authorities, marine facility owners and vessels operators are required to report certain incidents to the MAIB. These tend to be incidents which are more serious in nature or significant near misses. From the dataset, the most frequently occurring incident is 'Equipment failure' at 33.3%, followed by 'grounding' and Impact with Structure both at 20 %. Table 16 presents RNLI national dataset incidents with their locations displayed in Figure 15. The table and figures show there were 32 incidents recorded between 2010 and 2023. For the RNLI dataset, the most frequent type of incident was 'Other nautical incident' followed by 'Equipment failure' and 'Person(s) in distress' with 10, 7 and 5 incidents respectively making up 71% (combined) of all incidents.

Some incidents may be duplicated across the two datasets due to the way in which they are recorded between the RNLI and MAIB. This means that the true total incident rates may be less frequent than stated in this report. For this reason, all incident datasets have been presented individually.

Table 15. MAIB Marine Incident Summary for the Study Area (2010 to 2023)

Incident Category	Year															Annual Frequency
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total	
Equipment failure	0	0	0	0	0	1	0	1	1	2	0	0	0	0	**5**	0.36
Fire/Explosion	0	0	1	0	0	0	0	0	0	0	0	0	0	0	**1**	0.07
Grounding	0	0	0	0	0	2	0	0	0	0	0	1	0	0	**3**	0.21
Impact with structure	0	0	0	1	0	0	0	0	0	0	0	0	0	2	**3**	0.21
Other Nautical Safety	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**	0.07
Person in the water	0	0	0	0	0	0	0	0	0	0	1	0	0	0	**1**	0.07
Person(s) in distress	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0.07
Total	**1**	**0**	**1**	**1**	**1**	**3**	**0**	**1**	**1**	**2**	**1**	**1**	**0**	**2**	**15**	1.07

Table 16. RNLI Marine Incident Summary for the Study Area (2010 to 2023)

Incident Category	Year															Annual Frequency
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total	
Collision	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**1**	0.07
Equipment failure	0	0	0	0	2	1	0	2	1	0	0	0	0	1	**7**	0.50
Grounding	0	0	0	1	0	0	0	0	0	0	0	1	0	0	**2**	0.14
Other Nautical Safety	0	0	0	0	0	0	0	3	2	4	0	1	0	0	**10**	0.71
Person in the water	1	0	2	0	0	0	0	0	0	0	0	1	0	0	**4**	0.29
Person(s) in distress	0	1	1	1	0	0	0	0	1	0	0	0	1	0	**5**	0.36
Sinking/Capsize	1	0	0	1	0	0	0	0	0	0	0	0	0	0	**2**	0.14
Total	**2**	**1**	**3**	**3**	**2**	**1**	**0**	**5**	**5**	**4**	**0**	**3**	**1**	**1**	**31**	2.21

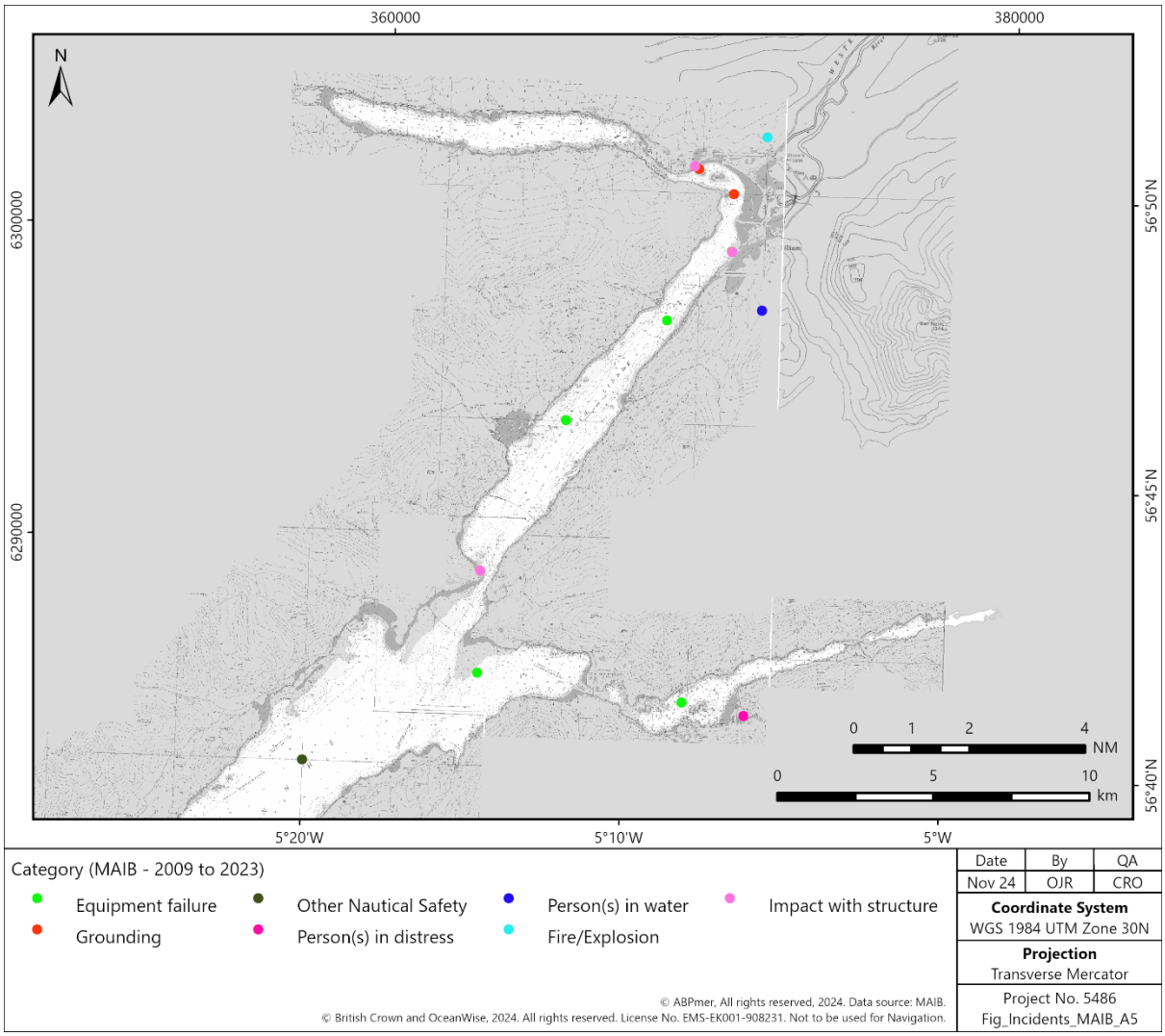

Figure 14. MAIB Accidents/ Incidents

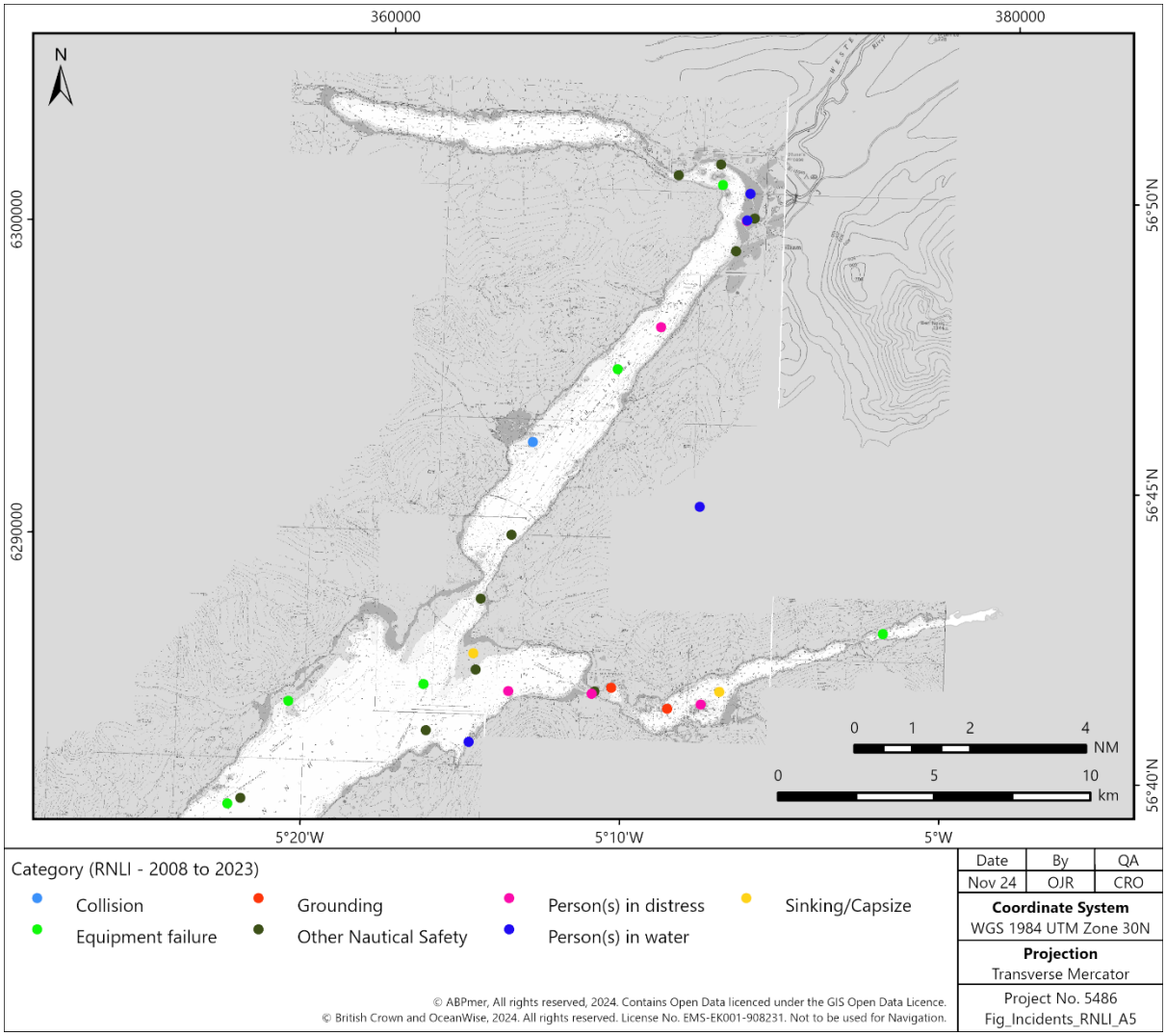

Figure 15. RNLI Accidents/ Incidents

4 Development Details

The Corran Ferry Infrastructure Improvement Scheme aims to modernise and enhance the vital ferry link across the Corran Narrows of Loch Linnhe. The project will upgrade shoreside infrastructure at both Ardgour and Nether Lochaber. Figure 16 shows the development at Ardgour and Nether Lochaber.

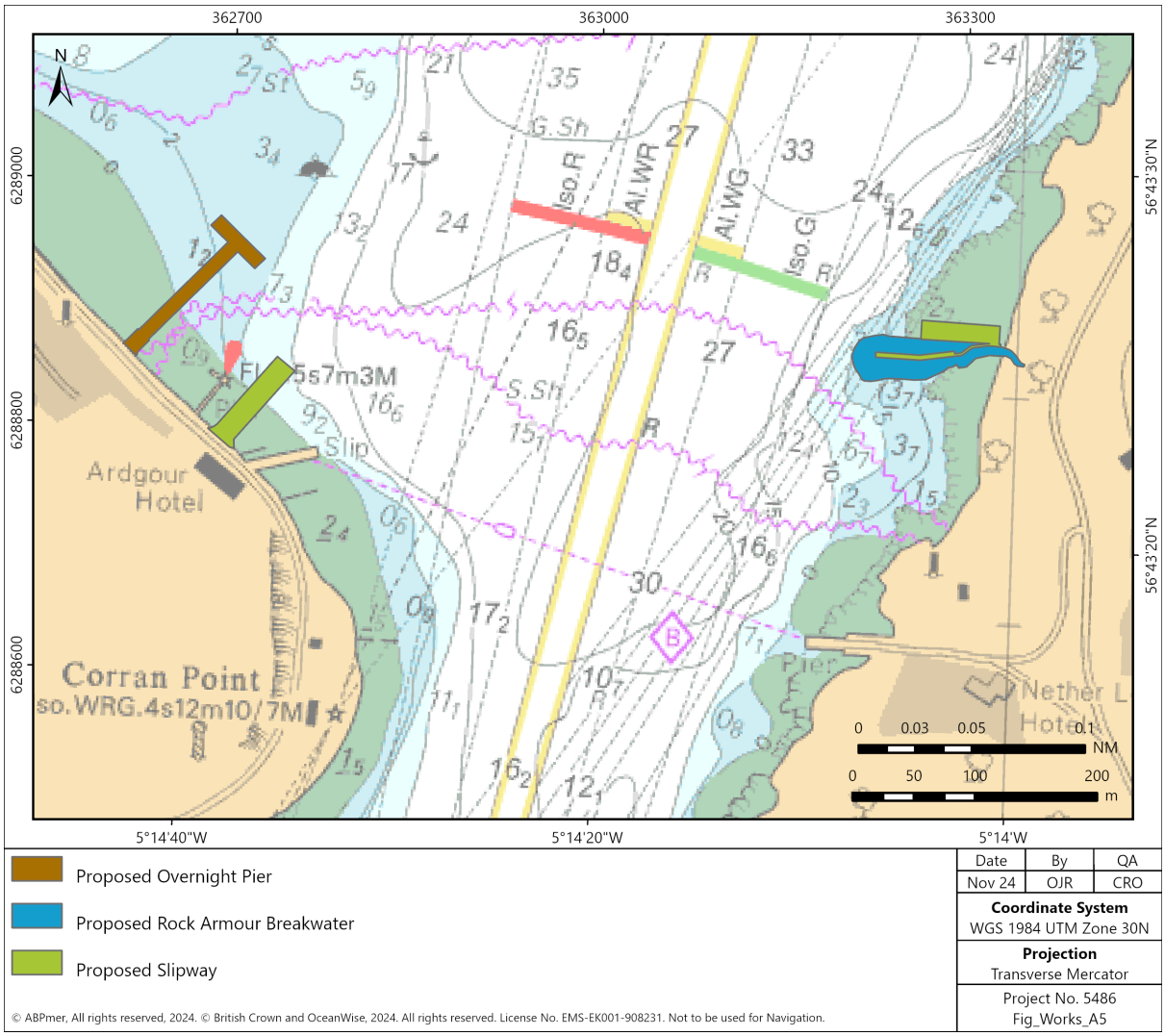

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Figure 16 Proposed Marine Works

4.1 Proposed Development Description

The proposed development includes new slipways, an overnight berthing pier, breakwater, marshalling areas, parking facilities, and public amenities to support ferry operations on both sides of the Corran Narrows. Key components of the infrastructure improvement scheme include:

- **A New Slipway at Ardgour:** a new 1:8 gradient slipway will be built to replace the existing one, improving docking ease and compatibility with a broader range of vessels across the Scottish ferry network. The steeper gradient enhances interchangeability, accommodating the electric ferry as well as potential future vessels. Constructed with precast and in-situ concrete, the slipway will feature reinforced steel sheet piling and rock armouring to protect against tidal erosion.

- **A New Slipway at Nether Lochaber:** a similarly robust slipway with rock-armoured breakwater will be constructed on the eastern side, using precast and in-situ concrete to ensure long-term durability. The breakwater will protect the slipway from tidal forces, enhancing safety and operational stability. This slipway is designed to accommodate the new electric ferry while remaining separate from current ferry operations to ensure minimal service disruption.

- **Overnight Berthing Pier:** the project includes a new overnight berthing pier at Ardgour, with two dedicated berths located at each end of a T-head pier. This structure will replace existing swing moorings, offering secure overnight docking with facilities for safe crew transfer, power charging, and water bunkering. The T-head design provides shelter from northeasterly winds, critical for vessel safety during overnight mooring.

- **Capital Dredging and Shore Reclamation:** dredging will create a consistently navigable channel, ensuring reliable tidal access for the new electric ferry and the relief vessel, MV Glencoul. Dredged materials will be reused where possible in construction, supplemented by additional rock fill where necessary. Limited shoreline reclamation on the Ardgour side will increase operational space between the slipway and berthing pier, enhancing stability and functionality.

- **Nether Lochaber Shore Reclamation and Public Amenities:** on the east side, foreshore reclamation will create space for expanded marshalling areas, parking, and public amenities, including a cycle path and restroom facilities, ensuring that the infrastructure supports both operational and public needs.

- **Minimal Operational Disruption:** the construction on the Nether Lochaber side will remain fully independent of existing ferry operations, while works on the Ardgour side will be phased to minimize impacts on service.

- **The infrastructure improvements:** set to begin in autumn 2025 and complete by Easter 2026, will support the transition to a new electric ferry, providing a sustainable and resilient ferry service for the region.

All infrastructure developments are targeted for completion by the end of 2026 to support the anticipated arrival of the new electric ferry in 2028.

4.2 Proposed development operations

On completion of the slipways at Nether Lochaber and Corran, the ferry route will resume operation similarly to its previous execution. Ferry procedures and passage plans will be updated to reflect the new infrastructure, route, and the introduction of a new vessel. The new electric Corran Ferry will provide a zero-emission alternative, reducing environmental impact and enhancing operational efficiency. The ferry service will maintain a consistent schedule across the Corran Narrows, ensuring accessibility for residents, visitors, and commercial traffic, which is vital for supporting the local economy and social well-being. With the construction of the new pier, overnight berthing procedures for the Corran Ferry will be introduced to the Ferry Marine Safety Management Systems. This upgrade from a swing mooring for overnight berthing, provides a stable and accessible location, improves safety and reliability of the ferry service.

4.3 Future traffic baseline

In considering the current utilisation of the study area against the proposed development's operating procedures, it is considered that there may be negligible change in vessel transits as, the current ferry schedule will be applied to the new infrastructure resulting in the same quantity of vessel movements. The only difference is the spatial footprint of the ferry route will be amended by *circa* 250 m to the north on the Nether Lochaber side; but will transit to the same point on the Ardgour side. There will no longer be a requirement for the ferry to moor to a buoy overnight, thereby removing some short-distance transits from the future traffic baseline.

5 Hazard Log Assessment

5.1 Introduction

This section provides summarised information on the risk assessment process as conducted for the Corran Ferry Infrastructure Improvement Scheme.

In total, the HAZID workshop reviewed 16 construction hazard scenarios and 7 operation hazard scenarios. Each hazard scenario is detailed in the Hazard Log, which are provided in Appendices D and E respectively. The hazard scenarios from the HAZID were discussed by the stakeholders and have then been subject to further review by the study team. From this process, causes, current controls, and potential future controls are summarised. An assessment of risk has also been made, with the summary outcome presented for each hazard scenario. The following sections provide a commentary on the process.

5.2 Potential causes

The potential causes leading to each of the identified hazard scenarios have been considered as part of the risk assessment process. Table 17 and Table 18 present a compiled list of potential causes. These potential causes, and the hazards to which they apply can be found in the risk assessments contained within the Hazard Log provided at Appendices C and D.

Table 17. Hazard Scenario Potential Causes – Construction

Potential Causes	Count
Adverse weather conditions	12
Vessel breakdown or malfunction	12
Human error/fatigue - Vessel Personnel	11
Communication failure - Personnel	10
Inadequate procedures in place onboard vessel	10
Inadequate training/competence - Personnel	8
Restricted visibility	7
Incorrect assessment of tidal flow/current	6
AIS failure	4
Failure to comply with safe systems of work	4
Failure to follow passage plan	4
Inadequate marine procedures - Project	4
Unplanned interaction with recreational/fishing craft	4
Human error/fatigue - Construction personnel	3
Inadequate bridge resource management	3
Inadequate maintenance/inspection	3
Loss of watertight integrity	3
Manoeuvre misjudged	3
Navigation equipment failure	3
Notice to Mariners failure to observe	3
Unplanned interaction with ferry/tour boat	3
Communication failure - Operational/procedural	2
Excessive vessel speed	2
Human error - Other Ship Personnel	2
Procedures - shoreside, inadequate	2
Safe systems of work/THC procedure - failure to comply	2
Towing equipment failure	2
Vessel has unreported defect	2
Bridge resource management -inadequate	1
Failure of Aid to Navigation (out of position/unlit)	1
Fire/Explosion	1
Interaction - recreational craft, unplanned	1
Interaction with passing vessel	1
Limited area for manoeuvring	1
Procedures - vessel, inadequate	1
Reduction in safe navigable space	1
Scheduling conflict	1
Training/competence - others, inadequate	1
Tugs - towing equipment failure	1
Vessel Ramps or Hatches not secure	1

Table 18. Hazard Scenario Potential Causes – Operation

Potential Causes	Count
Human error/fatigue - Vessel Personnel	6
Adverse weather conditions	6
Limited area for manoeuvring	6
Reduction in safe navigable space	6
Unplanned interaction with recreational/fishing craft	5
Incorrect assessment of tidal flow/current	5
Manoeuvre misjudged	5
Increased vessel use	5
Inadequate procedures in place onboard vessel	4
Inadequate training/competence - Personnel	4
Restricted visibility	4
Communication failure - Personnel	3
Inadequate bridge resource management	3
Vessel breakdown or malfunction	3
Failure of Aid to Navigation (out of position/unlit)	3
Excessive vessel speed	3
Human error	3
Competence	3
Failure to observe standing notices	2
Incapacitated master (drinks/drugs)	2
Human error/fatigue - Construction personnel	2
Inadequate surveying	2
Communication failure - Operational/procedural	1
Failure to comply with safe systems of work	1
Non-attendance of boatmen	1
Risk Assessment, Incomplete/not reviewed	1
Inadequate marine procedures - Project	1
Failure to follow passage plan	1

Descriptions of potential causes across the hazards identified for both construction and operation combined:

- **Adverse Weather Conditions:** Weather conditions such as fog, rain, or storms can reduce visibility and increase the risk of accidents.
- **AIS Failure:** A failure in the Automatic Identification System (AIS) can hinder vessel tracking and reduce situational awareness.
- **Bridge Resource Management - Inadequate:** Poor coordination among bridge crew can lead to miscommunication and operational errors.
- **Communication Failure - Operational/Procedural:** Breakdown in procedural communication can lead to misunderstandings and mishandling of operations.
- **Communication Failure - Personnel:** Miscommunication among personnel can result in unsafe decisions and actions.

- **Competence:** Lack of necessary skills or experience can lead to poor decision-making and unsafe handling of the vessel.
- **Excessive Vessel Speed:** High speeds reduce reaction time, increasing the risk of accidents.
- **Failure of Aid to Navigation (Out of Position/Unlit):** Missing or mislocated navigation aids can create confusion and lead to accidents
- **Failure to Comply with Safe Systems of Work:** Ignoring safety protocols can put personnel and vessel at risk.
- **Failure to Follow Passage Plan:** Deviating from the planned route can lead to unexpected hazards and increased accident risk.
- **Failure to Observe Standing Notices:** Ignoring standing notices can result in unsafe navigation practices.
- **Fire/Explosion:** Fires or explosions on board can cause severe damage and put lives at risk.
- **Human Error:** Mistakes made by personnel can lead to accidents and unsafe conditions.
- **Human Error - Other Ship Personnel:** Mistakes by crew other than the primary operator can still affect vessel operations.
- **Human Error/Fatigue - Construction Personnel:** Fatigue or mistakes by construction personnel can lead to unsafe conditions.
- **Human Error/Fatigue - Vessel Personnel:** Tired or inattentive vessel personnel are more likely to make mistakes.
- **Inadequate Bridge Resource Management:** Poor coordination on the bridge increases the risk of navigational errors.
- **Inadequate Maintenance/Inspection:** Lack of regular maintenance can lead to equipment failure and unsafe conditions.
- **Inadequate Marine Procedures - Project:** Insufficient planning for marine projects can create hazards.
- **Inadequate Procedures in Place Onboard Vessel:** Lack of effective procedures increases operational risk.
- **Inadequate Surveying:** Insufficient surveying of waterways can lead to inaccurate information about navigable space.
- **Inadequate Training/Competence - Personnel:** Lack of training can lead to poor decision-making and unsafe practices.
- **Incapacitated Master (Drinks/Drugs):** The vessel master's incapacity due to substance use endangers operations.
- **Incorrect Assessment of Tidal Flow/Current:** Incorrect assessment of currents affects vessel manoeuvring.

- **Increased Vessel Use:** High vessel traffic increases congestion and accident risk.
- **Interaction - Recreational Craft, Unplanned:** Unexpected interactions with recreational craft can disrupt operations.
- **Interaction with Passing Vessel:** Passing vessels can affect manoeuvrability, increasing collision risk.
- **Limited Area for Manoeuvring:** Restricted manoeuvring space raises the risk of collision or grounding.
- **Loss of Watertight Integrity:** Compromised hull integrity can lead to flooding and sinking.
- **Manoeuvre Misjudged:** Misjudged manoeuvres can lead to collisions or groundings.
- **Navigation Equipment Failure:** Faulty navigation equipment increases the likelihood of navigational errors.
- **Non-Attendance of Boatmen:** Absence of boatmen can disrupt docking and mooring operations.
- **Notice to Mariners Failure to Observe:** Ignoring notices can result in navigation through unsafe areas.
- **Procedures - Shoreside, Inadequate:** Ineffective shoreside procedures increase the risk of operational errors.
- **Procedures - Vessel, Inadequate:** Inadequate onboard procedures can lead to unsafe practices.
- **Reduction in Safe Navigable Space:** Reduced space limits manoeuvring options, increasing collision risk.
- **Restricted Visibility:** Poor visibility makes navigation challenging and increases collision risk.
- **Risk Assessment, Incomplete/Not Reviewed:** An incomplete or outdated risk assessment can overlook hazards.
- **Safe Systems of Work/THC Procedure - Failure to Comply:** Non-compliance with safety systems endangers personnel.
- **Scheduling Conflict:** Conflicts in scheduling can increase congestion and operational risk.
- **Spontaneous Combustion:** Unexpected combustion onboard poses fire hazards.
- **Towing Equipment Failure:** Faulty towing equipment hinders safe towing operations.
- **Training/Competence - Others, Inadequate:** Insufficient training for personnel impacts safety.
- **Tugs - Towing Equipment Failure:** Malfunctioning towing equipment jeopardizes towing operations.
- **Unplanned Interaction with Ferry/Tour Boat:** Unexpected encounters with ferries or tour boats increase collision risk.

- **Unplanned Interaction with Recreational/Fishing Craft:** Interactions with smaller craft can disrupt navigation.
- **Vessel Breakdown or Malfunction:** Mechanical failure may leave the vessel stranded.
- **Vessel has unreported defect:** Unreported issues compromise vessel reliability.
- **Vessel Ramps or Hatches Not Secure:** Unsecured ramps/hatches can cause accidents or pollution.

5.3 Current controls

During the risk analysis, each hazard scenario was considered in the context of the current risk controls relating to each hazard scenario. Current risk controls relate to processes, practices and available safety resources that are in existence with the aim to mitigate the consequence or frequency of an incident occurring during marine operations. Table 19 and Table 20 present the current risk controls for the construction and operation phases, with an occurrence count for each.

Table 19. Current Controls – Construction

Current Controls	Count
Safety Management System	15
Contractor risk assessment method statement (RAMS)	11
Vessel's emergency response procedures	9
Comply with CDM Regulations	9
Emergency services equipment - shore side	7
Standing Orders/SOPs	6
Safe systems of work (H&S)	4
Regular Contractor Audits (of works vessels)	4
Domestic Safety Management System (DSM)	4
Vessel maintenance	3
Communications equipment	2
Oil spill contingency plans	2
Tier 2 contractor	2
Passage planning	2
Ferry Operations Manual & Safety Management System	2
Vessel inspection/survey	2
Availability of latest hydrographic information	2
Weather forecasting	1
Visual observation (clear line of sight)	1
Local emergency services	1
Diver down 'Alpha' flag used whenever diver is submersed	1
Availability of tidal information and tidal flow characteristics	1

Table 20. Current Controls – Operation

Current Controls	Count
Safety Management System	6
Emergency services equipment - shore side	5
Oil spill contingency plans	5
Tier 2 contractor	5
Vessel's emergency response procedures	4
Aids to navigation, Provision & maintenance of	4
Domestic Safety Management System (DSM)	3
Ferry Operations Manual & Safety Management System	3
Passage planning	3
Weather forecasting	3
Communications equipment	2
Dredging programme	2
Safe systems of work (H&S)	1

Descriptions of controls across the hazards identified for both construction and operation combined:

- **Safety Management System:** The Marine Safety Management System (SMS) provides a structured approach to managing safety risks, ensuring compliance with safety protocols and reducing the likelihood of incidents. This was identified 21 times.
- **Contractor Risk Assessment Method Statement (RAMS):** Contractor-specific RAMS documents outline potential hazards and control measures, ensuring that risks are managed effectively during operations. This was identified 11 times.
- **Vessel's Emergency Response Procedures:** Established emergency response procedures onboard vessels guide personnel in responding to incidents, reducing risks and ensuring quick actions in emergencies. This was identified 13 times.
- **Comply with CDM Regulations:** Adherence to Construction (Design and Management) Regulations ensures that construction-related health and safety requirements are met, minimizing risk to personnel and the environment. This was identified nine times.
- **Emergency Services Equipment - Shore Side:** Shore-based emergency services equipment, such as firefighting tools and rescue gear, supports response efforts to incidents occurring near the shore. This was identified 12 times.
- **Standing Orders/SOPs:** Standard Operating Procedures (SOPs) and Standing Orders provide a consistent approach to operations, helping to manage risks by ensuring all personnel follow the same guidelines. This was identified six times.
- **Safe Systems of Work (H&S):** Safe systems of work for health and safety establish procedures that protect personnel from workplace hazards, reducing the risk of injury. This was identified five times.
- **Regular Contractor Audits (of Works Vessels):** Routine audits of contractor-operated vessels help ensure compliance with safety and operational standards, identifying areas for improvement. This was identified four times.

- **Domestic Safety Management System (DSM):** The Domestic Safety Management System ensures that all vessels and personnel operate according to safety regulations and procedures, reducing the risk of incidents. This was identified seven times.
- **Vessel Maintenance:** Regular maintenance of vessels ensures that all equipment and systems function optimally, reducing the risk of mechanical failures that could lead to incidents. This was identified three times.
- **Communications Equipment:** Reliable communication devices, such as radios, ensure effective coordination among vessels and personnel, reducing the risk of misunderstandings during operations. This was identified four times.
- **Oil Spill Contingency Plans:** Established contingency plans for oil spills enable a structured and timely response, minimizing environmental impact and protecting marine ecosystems. This was identified seven times.
- **Tier 2 Contractor:** Availability of Tier 2 contractors provides specialized support for managing larger or more complex incidents, ensuring effective responses to emergencies. This was identified seven times.
- **Passage Planning:** Detailed passage plans help mariners navigate safely by accounting for environmental conditions, vessel capabilities, and potential hazards. This was identified five times.
- **Ferry Operations Manual & Safety Management System:** The Ferry Operations Manual and Safety Management System set out operational and safety protocols, ensuring safe ferry operations. This was identified five times.
- **Vessel Inspection/Survey:** Regular inspections and surveys of vessels assess their seaworthiness and identify any maintenance needs, reducing the risk of operational failures. This was identified twice.
- **Availability of Latest Hydrographic Information:** Access to the latest hydrographic data helps mariners avoid hazards, such as shallow areas, by providing updated information on water depths and contours. This was identified twice.
- **Weather Forecasting:** Accurate weather forecasts provide mariners with essential information to prepare for adverse weather, reducing the risk of incidents related to sudden weather changes. This was identified four times.
- **Visual Observation (Clear Line of Sight):** Maintaining a clear line of sight enables personnel to detect hazards early, improving situational awareness and reducing collision risks. This was identified once.
- **Local Emergency Services:** Close collaboration with local emergency services ensures prompt assistance during incidents, enhancing safety in and around the port area. This was identified once.
- **Diver Down 'Alpha' Flag Used Whenever Diver is Submersed:** Displaying the 'Alpha' flag when a diver is submerged alerts nearby vessels, reducing the risk of accidental collisions with the diver. This was identified once.

- **Availability of Tidal Information and Tidal Flow Characteristics:** Up-to-date tidal information allows mariners to plan navigation during favourable tides, reducing risks related to grounding or strong currents. This was identified once.
- **Aids to Navigation, Provision & Maintenance of:** Properly maintained navigational aids, such as buoys and lights, guide vessels safely through waterways, minimizing the risk of collisions. This was identified four times.
- **Dredging Programme:** A systematic dredging program maintains adequate water depths, reducing the risk of grounding and allowing safe navigation. This was identified twice.

5.4 Risk assessment: current risk outcome

Table 20 shows the risk outcomes for the hazard scenarios with current controls in place, this ranking is based on 'risk score'.

Table 21. Construction Hazard Scenarios

Construction				Current frequency and consequence					Risk Score
Risk ID.	Hazard Category	Hazard Scenario		Frequency	People	Environment	Property	Business	
C.01	Accident to pers.	Man overboard during dredge/construction works	WC	2	3	0	0	3	4.50 Intolerable
			ML	5	1	0	0	1	
C.02	Accident to pers.	Diving operations associated with marine works	WC	2	3	1	0	4	4.69 Intolerable
			ML	5	0	0	0	1	
C.03	Allision	Dredge/construction plant impact with marine works	WC	3	2	3	2	2	5.06
			ML	5	0	1	0	1	
C.04	Allision	Recreational or fishing allision with marine works	WC	3	4	3	2	4	5.94 Intolerable
			ML	5	1	1	0	1	
C.05	Collision	Dredge/construction plant collision with rec vessel	WC	3	4	4	2	4	5.63 Intolerable
			ML	5	1	1	0	0	
C.06	Collision	Marine Works craft with ferry on swing mooring	WC	2	1	3	2	4	4.50
			ML	4	0	1	0	1	
C.07	Collision	Tug and tow collision with fishing/rec/aquaculture vessel	WC	2	4	4	3	4	5.13
			ML	4	1	1	0	1	
C.08	Collision	Dredger to and from disposal site	WC	1	4	4	3	4	5.56
			ML	5	1	1	0	1	
C.09	Fire/Explosion	Dredge/construction plant on-board fire	WC	2	4	4	2	3	4.69
			ML	4	1	1	0	0	
C.10	Flooding	Dredger flooding whilst engaged in operations	WC	2	4	4	3	4	5.19
			ML	4	0	2	0	2	
C.11	Grounding	Dredger grounding whilst engaged in operations	WC	3	0	2	0	3	4.44
			ML	5	0	1	0	1	
C.12	Hazardous sub.	Accidental spill during works	WC	4	0	0	3	3	4.88 Intolerable
			ML	5	0	0	1	1	
C.13	Other	Weather conditions leading to marine safety problem	WC	2	3	3	1	4	4.56
			ML	5	0	0	0	1	
C.14	Other	Contact with Subsea powerline, anchoring/dredging	WC	3	0	3	0	3	3.81
			ML	4	0	0	0	1	
C.15	Other	Strong Tidal currents – construction craft	WC	2	3	3	3	4	4.69
			ML	4	0	1	0	1	

Construction				Current frequency and consequence					Risk Score
Risk ID.	Hazard Category	Hazard Scenario		Frequency	People	Environment	Property	Business	
C.16	Payload related	Incorrect payload distribution/stability affected by load	WC	2	4	1	0	4	4.31
			ML	5	1	0	0	0	
WC: Worst Credible Scenario ML: Most Likely Scenario									

Table 22. Operation Hazard Scenarios

Operation				Current frequency and consequence					Risk Score
Risk ID.	Hazard Category	Hazard Scenario		Frequency	People	Environment	Property	Business	
O.01	Accident to pers.	Overnight berthing	WC	2	3	0	0	3	4.13
			ML	5	1	0	0	1	
O.02	Allision	Ferry boat allision with breakwater	WC	2	4	3	3	3	5.44
			ML	5	1	1	0	1	
O.03	Allision	Recreational/fishing vessel allision with marine works	WC	2	2	2	2	3	4.94
			ML	5	1	1	0	1	
O.04	Collison	Small non-powered craft displaced by breakwater/slipway/overnight pier	WC	2	4	1	0	4	5.06
			ML	5	1	1	0	1	
O.05	Collison	Ferry collides with other vessels	WC	2	4	3	3	3	5.06
			ML	5	1	1	0	0	
O.06	Grounding	Any vessel, post construction seabed change or debris	WC	2	2	3	2	4	4.88
			ML	4	1	1	0	1	
O.07	Grounding	Maintenance dredging incidents	WC	2	2	3	2	4	4.88
			ML	4	1	1	0	1	
WC: Worst Credible Scenario ML: Most Likely Scenario									

5.5 Potential future controls

Table 23 and Table 24 set out the identified future controls for construction and operation of the proposed development respectively along with an occurrence count to aid understanding of the controls with the widest application. The count associated with each future control should not be interpreted as a measure of an individual control's significance in reducing risk.

Table 23. Future Risk Controls – Construction

Future Risk Control	Count
Notification of works, timing, etc., to local communities	10
Notice to Mariners and Works 'Point of Contact'	6
Safety boat during marine works	5
Temporary marking of structures (AtoN)	5
All dredge/construction vessels to carry AIS (A or B)	3
Contractor vessel pollution response equipment	3
Monitoring of weather/wave conditions	2
Consultation with Cruise arrivals	1
Power cable owner to supply details plans of cable locations	1
Liaison point between Power Cable owners and site contractors	1
Creation of detailed emergency plan in case of cable snagging	1

Table 24. Future Risk Controls – Operation

Future Risk Control	Count
Additional AtoN on breakwater	4
Update to THC Corran Ferry Management System	3
Update to shoreside facility maintenance programme	3
Relocation of NLB Sector Light (AtoN)	3
Update to THC berthing procedures for overnight at Ardgour	2
Safety lighting, commensurate with British Standard 5489-1	2
Targeted information distribution to user groups by THC	2
Bathymetric survey	2
Notification to UKHO regarding new structures	1
Update to shoreside facility maintenance programme (Owner)	1
Update to THC passage plan	1

Descriptions of potential future controls across the hazards identified for construction and operation combined:

- **Notification of Works, Timing, etc., to Local Communities:** Providing timely notifications to local communities about ongoing works ensures public awareness of construction activities and reduces potential disturbances. A Marine management plan detailing stakeholders and communications channels is a good format for delivering this control. This was identified ten times.

- **Notice to Mariners and Works 'Point of Contact':** Issuing Notices to Mariners and establishing a dedicated point of contact for ongoing works helps maintain clear communication and improves navigation safety by keeping mariners informed. This was identified six times.

- **Safety Boat During Marine Works:** Deploying a safety boat during marine works provides immediate support in case of emergencies, protecting both workers and passing vessels. This was identified five times.

- **Temporary Marking of Structures (AtoN):** Temporarily marking structures with Aids to Navigation (AtoN) during construction helps prevent accidental collisions, enhancing visibility for approaching vessels. This was identified five times.

- **Additional AtoN on Breakwater:** Installing additional Aids to Navigation (AtoN) on the breakwater improves navigation safety by increasing visibility, especially under challenging weather conditions. This was identified four times.

- **All Dredge/Construction Vessels to Carry AIS (A or B):** Equipping all dredge and construction vessels with Automatic Identification Systems (AIS) allows for real-time tracking, reducing the risk of vessel collisions during the construction phase. This was identified three times.

- **Contractor Vessel Pollution Response Equipment:** Ensuring that contractor vessels carry pollution response equipment enables immediate action in case of accidental spills, protecting marine environments. This was identified three times.

- **Update to THC Corran Ferry Management System:** Updating the Corran Ferry Management System ensures ferry operations are compatible with new construction updates, maintaining safety and reducing operational risks. This was identified three times.

- **Update to Shoreside Facility Maintenance Programme:** Revising the shoreside facility maintenance programme ensures facilities remain in optimal condition, supporting safe marine operations. This was identified three times.

- **Relocation of NLB Sector Light (AtoN):** Moving the NLB Sector Light provides better illumination and visibility for approaching vessels, enhancing navigation safety near construction areas. This was identified three times.

- **Monitoring of Weather/Wave Conditions:** Regularly monitoring weather and wave conditions helps in anticipating risks, allowing work to be adjusted based on forecasted conditions for enhanced safety. This was identified twice.

- **Update to THC Berthing Procedures for Overnight at Ardgour:** Revising berthing procedures for overnight stays at Ardgour ensures that vessels can safely dock, reducing risks associated with overnight operations. This was identified twice.

- **Safety Lighting, Commensurate with British Standard 5489-1:** Installing safety lighting according to British standards provides adequate illumination for safe operations during night-time or low-visibility conditions. This was identified twice.

- **Targeted Information Distribution to User Groups by THC:** Distributing specific information to user groups helps ensure that all relevant parties are informed of safety measures and project updates, improving coordination. This was identified twice.

- **Bathymetric Survey:** Conducting a bathymetric survey provides up-to-date data on underwater topography, aiding in safe navigation and construction planning. This was identified twice.

- **Consultation with Cruise Arrivals:** Consulting with cruise operators about construction schedules and impacts ensures smooth operations and minimizes disruption for arriving cruise vessels. This was identified once.

- **Power Cable Owner to Supply Detailed Plans of Cable Locations:** Having detailed plans of power cable locations helps contractors avoid accidental cable damage, preventing potential hazards. This was identified once.

- **Liaison Point Between Power Cable Owners and Site Contractors:** Establishing a liaison between cable owners and contractors allows for quick resolution of issues related to cable positioning and construction safety. This was identified once.

- **Creation of Detailed Emergency Plan in Case of Cable Snagging:** Preparing a specific emergency response plan for potential cable snagging ensures prompt action can be taken to minimize risks. This was identified once.

- **Notification to UKHO Regarding New Structures:** Informing the UK Hydrographic Office (UKHO) about new structures helps keep navigational charts updated, ensuring mariners have accurate information for safe passage. This was identified once.

- **Update to Shoreside Facility Maintenance Programme (Owner):** Updating the maintenance programme for shoreside facilities ensures they remain safe and functional, supporting overall operational safety. This was identified once.

- **Update to THC Passage Plan:** Revising the THC passage plan aligns navigation routes with the latest construction changes, reducing navigation risks for approaching vessels. This was identified once.

5.6 Risk assessment: Future risk outcomes

Table 25 and Table 26 sets out the future risk outcomes for the hazard scenarios assuming the implementation of the potential future control options identified. The future risk outcomes consider the potential frequency reduction and consequence reduction (as mitigation) from each future risk control considered. In some instances, the risk ratings remain the same after the potential future controls are applied. This is because although the controls proposed are beneficial to the degree of risk, the control has not created sufficient change to move the risk outcome to the next descriptor category.

Table 25. Construction Hazard Scenarios

Construction				Current frequency and consequence					Risk Score
Risk ID.	Hazard Category	Hazard Scenario		Frequency	People	Environment	Property	Business	
C.01	Accident to pers.	Man overboard during dredge/construction works	WC	2	3	0	0	3	4.13
			ML	5	1	0	0	1	
C.02	Accident to pers.	Diving operations associated with marine works	WC	2	3	1	0	4	3.94
			ML	4	0	0	0	1	
C.03	Allision	Dredge/construction plant impact with marine works	WC	3	2	3	2	2	4.69
			ML	4	0	1	0	1	
C.04	Allision	Recreational or fishing allision with marine works	WC	2	4	3	2	4	5.44
			ML	5	1	1	0	1	
C.05	Collision	Dredge/construction plant collision with rec vessel	WC	2	4	4	2	4	4.75
			ML	4	1	1	0	0	
C.06	Collision	Marine Works craft with ferry on swing mooring	WC	2	1	3	2	4	4.50
			ML	4	0	1	0	1	
C.07	Collision	Tug and tow collision with fishing/rec/aquaculture vessel	WC	1	4	4	3	4	4.19
			ML	3	1	1	0	1	
C.08	Collision	Dredger to and from disposal site	WC	1	4	4	3	3	5.00
			ML	5	1	1	0	1	
C.09	Fire/Explosion	Dredge/construction plant on-board fire	WC	2	4	4	2	3	4.69
			ML	4	1	1	0	0	
C.10	Flooding	Dredger flooding whilst engaged in operations	WC	2	4	4	3	4	5.19
			ML	4	0	2	0	2	
C.11	Grounding	Dredger grounding whilst engaged in operations	WC	3	0	2	0	3	4.44
			ML	5	0	1	0	1	
C.12	Hazardous sub.	Accidental spill during works	WC	3	0	0	3	3	4.50
			ML	5	0	0	1	1	
C.13	Other	Weather conditions leading to marine safety problem	WC	1	3	3	1	4	4.00
			ML	5	0	0	0	1	
C.14	Other	Contact with Subsea powerline, anchoring/dredging	WC	3	0	3	0	3	3.81
			ML	4	0	0	0	1	
C.15	Other	Strong Tidal currents – construction craft	WC	2	3	3	3	4	4.69
			ML	4	0	1	0	1	

Construction				Current frequency and consequence					Risk Score
Risk ID.	Hazard Category	Hazard Scenario		Frequency	People	Environment	Property	Business	
C.16	Payload related	Incorrect payload distribution/stability affected by load	WC	2	4	1	0	4	4.31
			ML	5	1	0	0	0	
WC: Worst Credible Scenario ML: Most Likely Scenario									

Table 26. Operation Hazard Scenarios

Operation				Current frequency and consequence					Risk Score
Risk ID.	Hazard Category	Hazard Scenario		Frequency	People	Environment	Property	Business	
O.01	Accident to pers.	Overnight berthing	WC	2	3	0	0	3	3.75
			ML	4	1	0	0	1	
O.02	Allision	Ferry boat allision with breakwater	WC	2	4	3	3	3	5.00
			ML	4	1	1	0	1	
O.03	Allision	Recreational/fishing vessel allision with marine works	WC	2	2	2	2	3	4.50
			ML	4	1	1	0	1	
O.04	Collison	Small non-powered craft displaced by breakwater/slipway/overnight pier	WC	2	4	1	0	4	5.06
			ML	5	1	1	0	1	
O.05	Collison	Ferry collides with other vessels	WC	1	4	3	3	3	4.19
			ML	4	1	1	0	0	
O.06	Grounding	Any vessel, post construction seabed change or debris	WC	1	2	3	2	4	3.94
			ML	3	1	1	0	1	
O.07	Grounding	Maintenance dredging incidents	WC	2	2	3	2	4	4.88
			ML	4	1	1	0	1	
WC: Worst Credible Scenario ML: Most Likely Scenario									

6 Hazard Discussion

This section expands upon the assessments and comments on future risk controls. Section 6.1 provides a commentary on those hazard scenarios which were intolerable before the inclusion of future risk controls which ultimately make them tolerable and ALARP.

6.1 Construction Hazards

Table 27 Identifies the three assessments at the current stage were identified with an intolerable risk score, this would be a result of one of the receptors (People, Port, Environment or Property) being too high on the tolerability matrix as described in Section 2.

Table 27 Intolerable Risks before Potential Future Contols

Construction			Current Risk Score	Future Risk Score
Risk ID.	Hazard Category	Hazard Scenario		
C.01	Accident to pers.	Man overboard during dredge/construction works	4.50	3.75
C.02	Accident to pers.	Diving operations associated with marine works	4.69	3.94
C.04	Allision	Recreational or fishing allision with marine works	5.94 Intolerable	5.44
C.05	Collision	Dredge/construction plant collision with rec vessel	5.63 Intolerable	4.75
C.12	Hazardous sub.	Accidental spill during works	4.88 Intolerable	4.50

6.1.1 01 - Accident to persons - Man overboard during dredge/construction works

During the marine works there will be an increased risk of persons entering the water due to the introduction of works vessels to the area and persons working close to the shoreline. These activities will increase the risk of man overboard and with the combination of working in adverse weather will increase further.

This assessment was identified as intolerable due to the effect to the increased frequency and consequence to people. The following Potential future controls were identified reducing the risk to a tolerable state:

- Safety boat during marine works
- Monitoring of weather/wave conditions

The safety boat enables persons to be rescued from the water in a quicker time as well as to be able to deter other vessels which may cause incidents resulting in a man overboard. Monitoring of weather conditions allows for proactive planning when it comes to activities which may result in a man overboard.

6.1.2 02 - Accident to persons - Diving operations associated with marine works

During the marine works there will be an increased risk of incidents associated with diving operations due to the introduction and need for diving activities during the construction of the new marine infrastructure. During these operations there could be significant risks to the divers.

This assessment was identified as intolerable due to the risk on people and the port business, the following potential future controls were added to reduce the level to tolerable:

- Notice to Mariners and Works 'Point of Contact'
- Safety boat during marine works
- All dredge/construction vessels to carry AIS (A or B)
- Notification of works, timing, etc to local communities
- Consultation with Cruise arrivals

A safety boat enables persons to be rescued from the water in a quicker time as well as to be able to deter other vessels which may cause incidents resulting injury to a diver. Consultation and the ability to raise awareness or disseminated information through consultation with cruise arrivals, Notice to Mariners and notifications of works and timings to the local community all reduces the likelihood of a vessel or diving operations to interact with another activity. All vessels carrying AIS also prompts another way for vessels engaged in the works to be observed and managed during the construction.

6.1.3 04 - Allision – Recreational or fishing allision with marine works

Recreational and fishing vessels transiting proximate to the marine works have the potential make heavy contact (allision) with the works during construction. Allision risk will be increased during times of adverse weather when wind activity and wave action has the potential to adversely affect vessel manoeuvring and in periods of reduced visibility where it will be difficult to see the infrastructure or marine works. The risk will also be increased in periods of high vessel movements as this will decrease the available space for manoeuvring.

This assessment was identified as intolerable due to the risk to people, the following potential future controls were added to reduce the level to tolerable:

- Notification of works, timing, etc to local communities
- Temporary marking of structures (AtoN)
- Contractor vessel pollution response equipment
- Notice to Mariners and Works 'Point of Contact'

Consultation and the ability to raise awareness or disseminated information through consultation with Notice to Mariners and notifications of works and timings to the local community reduces the likelihood of a vessel colliding with the marine works. Temporary AtoN also helps to identify the marine works area to any transient craft greater reducing the likelihood of the incident from occurring. Contractor vessels carrying oil spill equipment will aid in reducing the severity of an oil spill should one occur.

6.1.4 05 – Collision – Dredge/Construction plant collision with recreational vessel

Dredge/construction plant used during the marine works have the potential to collide with recreational vessels transiting past the works. The dredge and construction vessels could include jack-up platforms, barges, dredging plant or workboat support craft. Collision risk will be increased during times of adverse weather when wind activity and wave action has the potential to adversely affect vessel manoeuvring or when there is high vessel activity in the area. This assessment was identified as intolerable due to people and port business, the following potential future controls were added to reduce the level to tolerable:

- Notification of works, timing, etc to local communities
- Temporary marking of structures (AtoN)
- Notice to Mariners and Works 'Point of Contact'
- Safety boat during marine works

A safety boat enables persons to be rescued from the water in a quicker time as well as to be able to deter other vessels preventing a collision. Consultation and the ability to raise awareness or disseminated information through consultation with Notice to Mariners and notifications of works and timings to the local community reduces the likelihood of a vessel colliding with the marine works. Temporary AtoN also helps to identify the marine works area to any transient craft greater reducing the likelihood of the incident from occurring.

6.1.5 12 - Hazardous Substance – Accidental spill during works

During the marine works there is an increased risk of accidental spillage of oil, fuel and chemical pollutants from the dredge plant, construction vessel activity and marine construction works. This may result in a reduction in water quality. The prevailing weather conditions during any marine pollution event will dictate the path and extent of surface water sheens.

This assessment was identified as intolerable due to port business. the following potential future controls were added to reduce the level to tolerable

- Contractor vessel pollution response equipment
- Safety boat during marine works
- Notice to Mariners and Works 'Point of Contact'
- Notification of works, timing, etc to local communities

A safety boat allows for a more agile response to an oil spill scenario allowing for spills to be monitored and managed. Consultation and the ability to raise awareness or disseminated information through consultation with Notice to Mariners and notifications of works and timings to the local community allows for points of contact to be known in case of any spills being noticed. Contractor vessels carrying oil spill equipment will aid in reducing the severity of an oil spill should one occur.

7 Recommendations for Risk Controls

In considering the current risk outcomes in Table 21 and Table 22 against the future risk outcomes in Table 25 and Table 26, THC as the infrastructure owner can mitigate risk with the application of potential future controls to a tolerable state for all hazards identified for this proposed development.

The risk scores from Table 21 and Table 22 identify that, at the current stage, the 11 Construction and 7 Operational Hazard Scenarios, were within the tolerability levels with the remaining 5 construction hazards were intolerable.

The potential future risk controls applied to the hazards ensured that the level was brought down to a tolerable and ALARP state. Table 25 and Table 26 demonstrate reductions in risk score with the potential future controls applied. Therefore, due to the suggested potential future controls as described in Section 5.5, this NRA recommends that THC implement the following risk controls as part of the proposed development's construction and operation.

The risk controls applicable to construction and should be in place prior to any works commencing include the following:

1. All dredge/construction vessels, including barges to carry AIS (A or B).
2. Consultation with Cruise arrivals.
3. Contractor vessel pollution response equipment.
4. Creation of detailed emergency plan in case of cable snagging.
5. Liaison point between Power Cable owners and site contractors.
6. Monitoring of weather/wave conditions.
7. Notice to Mariners and Works 'Point of Contact'.
8. Notification of works, timing, etc to local communities.
9. Power cable owner to supply details plans of cable locations.
10. Safety boat during marine works.
11. Temporary marking of structures (AtoN).

The risk controls applicable to operation which should be in place prior to ferry and cargo operation taking place on the newly constructed infrastructure include the following:

1. Additional AtoN on breakwater.
2. Bathymetric survey.
3. Notification to UKHO regarding new structures.
4. Relocation of NLB Sector Light (AtoN).
5. Safety lighting, commensurate with British Standard 5489-1.
6. Targeted information distribution to user groups by THC.
7. Update to shoreside facility maintenance programme.
8. Update to THC berthing procedures for overnight at Ardgour.
9. Update to THC Corran Ferry Management System.
10. Update to THC passage plan.

Adoption of the proposed future risk controls during constructed and operated will assist the control of risks to navigation and marine operations to a point that is ALARP. However, there is potential for risk consequence or frequency to change over time, as well as the ability to effectively implement the above controls. Therefore, it is recommended that THC continues to monitor these risks going forwards and incorporate them into their ferry and marine facility safety management systems.

8 References

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Department for Transport (DfT), 2018. Port Marine Safety Code Guide to Good Practice (GtGP). Department for Transport, November 2018.

International Maritime Organization (IMO) 2018. Revised Guidelines For Formal Safety Assessment (FSA) For Use In The IMO Rule-Making Process. Revision 2, 09 April 2018.

Maritime Coastguard Agency (MCA), 2023. Methodology for Assessing Marine Navigational Safety & Emergency Response Risks offshore Renewable Energy Installations (OREI), Version 3.1 June 2023.

Taylor. L.A, 1997 Meteorological and Tidal Forcing of Loch Linnhe, a Scottish Sea-loch. September 1997.

The Highland Council (THC), 2024. Corran Ferry Infrastructure Improvement Scheme Scoping Report, May 2024, Scoping Request - Ferry Infrastructure Improvement | marine.gov.scot

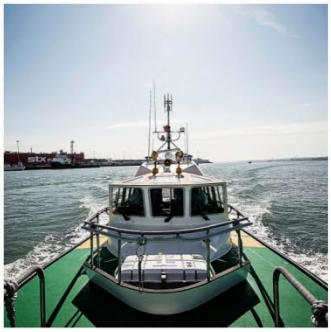
9 Abbreviations/Acronyms

AIS	Automatic Identification System
ALARP	As Low As Reasonably Practicable
AtoN	Aids to Navigation
CDM	Construction (Design and Management) Regulations
DfT	Department for Transport
DSM	Domestic Safety Management System
FSA	Formal Safety Assessment
GLA	General Lighthouse Authority
GtGP	Guide to Good Practice
HAZID	Hazard Identification
ID	Identity
IMO	International Maritime Organization
LOA	Length Overall
MAIB	Marine Accident Investigation Branch
MCA	Maritime and Coastguard Agency
MGN	Marine Guidance Note
ML	Most Likely Scenario
MSMS	Marine Safety Management System
NLB	Northern Lighthouse Board
NM	Nautical Miles
NRA	Navigation Risk Assessment
PMSC	Port Marine Safety Code
RAMS	Risk Assessment Method Statement
RIDDOR	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
RNLI	Royal National Lifeboat Institution
RYA	Royal Yacht Association
SHA	Statutory Harbour Authority
SMS	Safety Management System
SOP	Standard Operating Procedure
THC	The Highland Council
UK	United Kingdom
UTM	Universal Transverse Mercator
UKHO	UK Hydrographic Office
WC	Worst Credible Scenario
WGS	World Geodetic System

Cardinal points/directions are used unless otherwise stated.

SI units are used unless otherwise stated.

Appendices



Innovative Thinking - Sustainable Solutions

ABP mer

A Meeting Note: Pre-HAZID Categories and Scenario Discussion

Meeting Note

Subject	Pre-HAZID
Date meeting held	25/09/2024
Location	Microsoft Teams
ABPmer project no	R/5486/01/HJA
Project name	CFIIS NRA
Prepared by	Harry Aitchison
Attendees	Harry Aitchison, Andrew Maciver, Barry Purcell, Claire Williams, Innes Beaton, Murray Bain, Richard Porteous and Tom Rea

Subject: Pre-HAZID Categories and Scenarios Discussion

On 25 September 2024, ABPmer Maritime presented the hazards for consideration to The Highland Council and project team for the proposed development, Corran Infrastructure Improvement Scheme located in Loch Linnhe. The meeting covered the information and project details to be presented to the local stake holders. There was also considerations specifically focused around the identified potential general hazard scenarios and categories as part of the construction and operation of the proposed development and what future controls are acceptable for the development.

The meeting identified the 23 potential hazards for further review at the HAZID workshop, scheduled to take place on the October 03 2024, on Teams. These items are listed below in Table 1 and Table 2.

Table 1. Construction Hazards

ID	Hazard Category	Construction Hazard Scenarios
C.01	Accident to pers.	Man overboard during dredge/construction works
C.02	Accident to pers.	Diving operations associated with marine works
C.03	Allision	Dredge/construction plant impact with marine works
C.04	Allision	Recreational or fishing allision with marine works
C.05	Collision	Dredge/construction plant collision with rec vessel
C.06	Collision	Marine Works craft with ferry on swing mooring
C.07	Collision	Tug and tow collision with fishing/rec/aquaculture vessel
C.08	Collision	Dredger to and from disposal site
C.09	Fire/Explosion	Dredge/construction plant on-board fire
C.10	Flooding	Dredger flooding whilst engaged in operations
C.11	Grounding	Dredger grounding whilst engaged in operations
C.12	Hazardous sub.	Accidental spill during works
C.13	Other	Weather conditions leading to marine safety problem
C.14	Other	Contact with Subsea powerline, anchoring/dredging

C.15	Other	Strong Tidal currents – construction craft
C.16	Payload related	Incorrect payload distribution/stability affected by load

Table 2.Operation Hazards

ID	Hazard Category	Operation Hazard Scenarios
O.01	Accident to pers.	Overnight berthing
O.02	Allision	Ferry boat allision with breakwater
O.03	Allision	Recreational/fishing vessel allision with marine works
O.04	Collison	Small non-powered craft displaced by breakwater/slipway/overnight pier
O.05	Collison	Ferry collides with other vessels
O.06	Grounding	Any vessel, post construction seabed change or debris
O.07	Grounding	Maintenance dredging incidents

The Pre HAZID meeting also confirmed and highlighted potential future controls for further review at the HAZID workshop.

The following is a suggested list of Construction controls:

- Contractor Risk Assessment Method Statement (RAMS);
- Regular Contractor Audits (of works vessels);
- Notice to Mariners and Works 'Point of Contact';
- Notification of works, timing, etc to local communities;
- Safety boat during marine works;
- Monitoring of weather/wave conditions;
- Contractor vessel pollution response equipment;
- All dredge/construction vessels, including barges to carry AIS (A or B); and
- Temporary marking of structures (AtoN).

The following is a suggested list Operation Controls:

- Update to THC Corran Ferry Management System;
- Update to shoreside facility maintenance programme (Owner);
- Update to THC passage plan;
- Update to THC berthing procedures for overnight at Adgour;
- Installation of AtoN on new infrastructure;
- Notification to UKHO regarding new structures and AtoN locations;
- Bathymetric survey; and
- Safety lighting - Appropriate illumination of the marine works to be provided, without affecting mariners' night vision.

Last updated: 02 October 2024

B Meeting Note: HAZID Workshop

Minutes from HAZID

Topic: Corran Ferry Infrastructure Improvement Scheme

Date: 03/10/2024

Time: 0900-1200 hrs

Location: Microsoft teams:

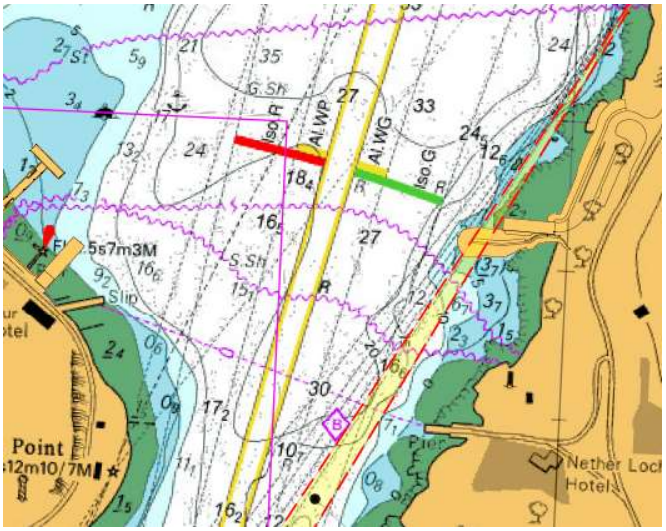
Attendees	**Initials**	**Organisation**
Harry Aitchison	HA	ABPmer
Megan Mardle	MM	ABPmer
Reece MacKay	RM	The Highland Council
Andrew Maciver	AM	The Highland Council
Murray Bain	MB	The Highland Council
Sarah Kennedy	SK	Fort William Marina &Shoreline Community Interest Company)
Robin Burnett	RB	Scottish Southern Energy Network
Mel Chisholm	MC	Scottish Southern Energy Network
Richard Porteous	RP	The Highland Council
Richard MacLeod	RM	Scottish Southern Energy Network
Calum Boyd	CB	Boyd Brothers Halage (limited)
Lachie Innes	LI	Scottish Southern Energy Network
Steve Munro	SM	The Highland Council
Innes Beaton	IB	Affric Ltd
Barry Purcell	BP	Wallace Stone LLP
Apologies		
Helen Croxson	HC	MCA
Paul Webster	PQ	Scottish Southern Energy Network
John Maclellan	JM	Subsea Testing and Evaluation (UK) Ltd
Calum McNicol	CM	Paddle Scotland
Sandra Morgan	SM	Boyd Brothers Halage (limited)

Topic/slide	Notes
1.Intro	Introduction and housekeeping from HA.

2. Project review	AM - overview of the project
	
	RP- Clarity point around the old vessel which is leaving.
	
	Questions:
	
	• SK - are you using all the dredge material? Can this be used for plans along Fort William water front.
	  ○ BP stated, that not much material is being taken. Will not be enough for our project so not enough for fort William.
	• SK - where is the infill coming from?
	  ○ BP stated, Local quarry. Glenn Sander likely to supply material.
	• SM - Proposed breakwater on the South - boat being pushed by strong tide and strong wind (north easternly) towards the breakwater meaning it could be difficult to manoeuvre in some conditions. The north easternly winds will mean that getting our will take a lot of power.
	  ○ RP – clarified that vessels and new vessel design specifically equipped to cope with various parameters.
	• SM – relocation north of the slipway may cause infrastructure for the cable supply.
	  ○ BP- SSEN is in discussion with project about getting power to the site for recharging of vessels. These are subsea cables to be moved and overhead cable diversions
	
	BP - Clarifying the weather conditions and the addition of breakwater means that the service will run more regularly.
	
	• RM clarified that the new structures should allow the ferry service to run more regular.
	• CB – raised concern of an marine works or movements that may obstruct large commercial vessels from navigating the channel.

4.Objective and Scope	HA - Scope of HAZID workshop - Potential hazard or marine safety impacts on the development.
5. Objective and scope	HA - Scope of HAZID workshop

6. Marine Traffic and vessel Traffic Data	HA - What will be captured for NRA. HA - Heat map of marine traffic using the channel.
7. Marine Facilities and Management	HA - Marine facilities and Management of the area. • SK - No Harbour authority for area, default harbour authority is the highland council:David Sedden (Harbours Manager: Mbl: 07768 030305, david.seddon@highland.gov.uk).
8. RNLI and MAIB incident Records	HA - RNLI call outs and MAIB incident records.
9. Aids to Navigation	HA - Buoyage and what aids to navigation would be moved due to the development. Questions: • RB - this should include beacons on the shore (3 on either side). Plotting the landfall of the subsea cable. • SK - Worked hard to get northern lights in with Northern Lighthouse board. Wants to be kept updated. ○ BP - Moved to the breakwater. General agreement that this is the right location to move the light to.
10. Marine work at Corran and Ardgour	BP - Marine work on the 2 sides. Starting with the Ardgour side.

11. Marine work at Corran and Ardgour	BP - Marine works on the Corran side. • SK - how much will this narrow the channel? ○ BP - NLB charts to the chat. Structure does not enter the navigable channel. 
12. Operational phase	RP - Operational phase of the Corran and Ardgour ferry. Highlighting that there is little change in the operation with positives of RoRo System.
13. Identification of Hazardous	HA - Exercise to identify construction of the project. Correct, incorrect or missed some.
14. Hazards - Construction	HA - Construction Hazard. Identification of Hazard construction: SK - Consultation with construction craft required due to displacement of water and wash caused by Cruise ships. Additional Hazardous No comment on need for additional hazardous

15. Hazards - Operation	HA - Operation Hazard. Identification of Hazard operation: No comments on the Operational hazards Additional Hazardous RB- Loss of vessel power leading to anchor being dropped and catching any remaining subsea cable BP - New breakwater meaning that vessels will be experiencing rapid change in current velocities which is different from current operations. Comments RB - subsea cable removal. Could be elements of subsea cable there after removal. Procedure is lost power then the anchor would have to be dropped. Further out a cable could be hit.

16. Identification of control	HA - Risk controls for construction.
	
	Comments and additional risk control measures:
	• SK - Nearest operational decompression chamber location known and on standby for divers.
	  ○ SK- Picking up with John whether they still have an operational decompression chamber North sands.
	  ○ SK- Aberdeen Royal Infirmary is most likely closest.
	  ○ SK- West of Scotland Centre for diving and hyberbaric medicine, chamber status on their website showing as not operational currently, maybe worth a call for clarity on that resource.
	• RP - contractor needs to include daily communication with the ferry terminal.
	• BP - Scheduling of use of the swing moorings during the construction phase including exclusion zones and protocols for construction vessels.
	  ○ Interface between contractors and ferry operator - swing moorings and how this work in relation to vessels. Close to T head overnight structure. Exclusion zones and protocols.
	  ○ Consideration for mooring of construction vessels.
	• MC - consultation with SSE for electricity and power - outages in place well in advance to ensure everything is ready and approved before energy.
	• RM - Consultation with SSE proving cables are dead.
	• RP - Hours of work. What time of day work will be undertaken will impact requirements for lighting and aids to navigation.

17. Identification of control	HA - risk controls for operation: Comments: No further controls needed.
18. Review of risk assessment	HA summaries next steps.
Final points	Presentation to be circulated with the risk assessment.

C Hazard Log: Construction

Hazard Scenario Title			Man overboard during dredge/construction works			Risk Reference	01	Hazard Category	Accident to pers.
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Man overboard (MoB) during the dredge/construction works, MoB hits head on the vessel leading to drowning. No pollution, minor delay to construction works.			MoB recovered to shore and treated for cold water immersion. No pollution, minor delay to construction works.			Human error - Other Ship Personnel	Communications equipment	In Place	
						Procedures - vessel, inadequate	Safe systems of work (H&S)	In Place	
						Communication failure - personnel	Emergency services equipment - shore side	In Place	
						Adverse weather conditions	Weather forecasting	In Place	
						Safe systems of work/THC procedure - failure to comply	Vessel's emergency response procedures	In Place	
						Procedures - shoreside, inadequate	Contractor risk assessment method statement (RAMS)	In Place	
						Training/competence - others, inadequate	Safety Management System	In Place	
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**			Comply with CDM Regulations	In Place	
3	**People**	3	5	**People**	1				
	Property Damage	0		**Property Damage**	0				
	Planet	0		**Planet**	0				
	Port Business	3		**Port Business**	1				
Risk Ranking	**4.50**	Intolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Controls						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Safety boat during marine works	Future	
							Monitoring of weather/wave conditions	Future	
2	**People**	3	4	**People**	1				
	Port Infrastructure	0		**Port Infrastructure**	0				
	Planet	0		**Planet**	0				
	Port Business	3		**Port Business**	1				
Risk Ranking	**3.75**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Diving operations associated with marine works			Risk Reference	02	Hazard Category	Accident to pers.
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Dredge/construction vessel unaware of divers in the water. Diver caught in propellers or umbilical severed, loss of life, operations cease, national adverse publicity.			Dredge/Construction vessel approaches diving area and does not see 'A' flag. Vessel is warned of underwater operations and alters course. Divers taken out of water, disruption to activities.			Human error - Other Ship Personnel	Communications equipment	In Place	
						Bridge resource management -inadequate	Safe systems of work (H&S)	In Place	
						Communication failure - personnel	Visual observation (clear line of sight)	In Place	
						Restricted visibility	Contractor risk assessment method statement (RAMS)	In Place	
						Safe systems of work/THC procedure - failure to comply	Safety Management System	In Place	
						Procedures - shoreside, inadequate	Local emergency services	In Place	
							Diver down 'Alpha' flag used whenever diver is submersed	In Place	
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**			Comply with CDM Regulations	In Place	
3	**People**	3	5	**People**	0				
	Property Damage	1		**Property Damage**	0				
	Planet	0		**Planet**	0				
	Business Continuity	4		**Business Continuity**	1				
Risk Ranking	**4.69**	Intolerable People	Tolerable Property	Tolerable Planet	Intolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Notice to Mariners and Works 'Point of Contact'	Future	
							Safety boat during marine works	Future	
2	**People**	3	4	**People**	0		All dredge/construction vessels to carry AIS (A or B)	Future	
	Port Infrastructure	1		**Port Infrastructure**	0		Notification of works, timing, etc to local communities	Future	
	Planet	0		**Planet**	0		Consultation with Cruise arrivals	Future	
	Port Business	4		**Port Business**	1				
Risk Ranking	**3.94**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Dredge/construction plant impact with marine works			Risk Reference	03	Hazard Category	Allision
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Dredge/construction vessel slow speed impact with structures during the marine works dredge/construction phase, leading to minor damage to vessel, serious injury to crew, minor pollution (Tier 1). Delay to marine works.			Slow speed impact results in no damage to vessel hull, minor injury to crew, no pollution. Minor delay to marine works.			Vessel breakdown or malfunction	Safety Management System	In Place	
						Interaction - recreational craft, unplanned	Oil spill contingency plans	In Place	
						Tugs - towing equipment failure	Tier 2 contractor	In Place	
						Adverse weather conditions	Vessel's emergency response procedures	In Place	
						Restricted visibility	Contractor risk assessment method statement (RAMS)	In Place	
						Manoeuvre misjudged	Regular Contractor Audits (of works vessels)	In Place	
						Unplanned interaction with ferry/tour boat	Comply with CDM Regulations	In Place	
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Incorrect assessment of tidal flow/current			
3	**People**	2	5	**People**	0				
	Property Damage	3		**Property Damage**	1				
	Planet	2		**Planet**	0				
	Business Continuity	2		**Business Continuity**	1				
Risk Ranking	**5.06**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			All dredge/construction vessels to carry AIS (A or B)	Future	
							Notification of works, timing, etc to local communities	Future	
2	**People**	2	4	**People**	0		Temporary marking of structures (AtoN)	Future	
	Port Infrastructure	3		**Port Infrastructure**	1		Contractor vessel pollution response equipment	Future	
	Planet	2		**Planet**	0				
	Port Business	2		**Port Business**	1				
Risk Ranking	**4.19**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Recreational or fishing allision with marine works			Risk Reference	04	Hazard Category	Allision
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Recreational or fishing vessel transiting past the marine works allides with temporary or part build structures. Impact causes vessel to be holed leading to flooding and the vessel sinking, multiple fatalities, delay to the construction programme, national adverse publicity, limited pollution (Tier 1).			Slow speed impact causes vessel damage, leading to minor injury to crew, no delay to construction programme, no pollution.			Human error/fatigue - Vessel Personnel	Emergency services equipment - shore side	In Place	
						Vessel breakdown or malfunction	Vessel's emergency response procedures	In Place	
						Unplanned interaction with recreational/fishing craft			
						Adverse weather conditions			
						Restricted visibility			
						Limited area for manoeuvring			
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Failure of Aid to Navigation (out of position/unlit)			
						Incorrect assessment of tidal flow/current			
						Notice to Mariners failure to observe			
3	**People**	4	5	**People**	1	Navigation equipment failure			
	Property Damage	3		**Property Damage**	1	Reduction in safe navigable space			
	Planet	2		**Planet**	0	Unplanned interaction with ferry/tour boat			
	Business Continuity	4		**Business Continuity**	1	Manoeuvre misjudged			
Risk Ranking	**5.94**	Intolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Notification of works, timing, etc to local communities	Future	
							Temporary marking of structures (AtoN)	Future	
2	**People**	4	5	**People**	1		Contractor vessel pollution response equipment	Future	
	Port Infrastructure	3		**Port Infrastructure**	1		Notice to Mariners and Works 'Point of Contact'	Future	
	Planet	2		**Planet**	0		Notification of works, timing, etc to local communities	Future	
	Port Business	4		**Port Business**	1				
Risk Ranking	**5.44**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Dredge/construction plant collision with rec vessel			Risk Reference	05	Hazard Category	Collision
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Collision of a recreational/fishing craft with a dredge/construction vessel. Vessels do not identify each other and do not take avoiding action. Recreational/fishing vessel holed and sinks, multiple fatalities, small scale pollution (Tier 1), construction activities cease until investigation and recovery of vessel complete.			Vessels take avoiding action resulting in minor collision. Recreational/fishing vessel receives minor damage, no damage to dredge/construction plant, minor injuries, no pollution. No delay to construction activities.			Human error/fatigue - Vessel Personnel	Emergency services equipment - shore side	In Place	
						Human error/fatigue - Construction personnel	Vessel's emergency response procedures	In Place	
						Inadequate bridge resource management	Contractor risk assessment method statement (RAMS)	In Place	
						Inadequate procedures in place onboard vessel	Safety Management System	In Place	
						Vessel breakdown or malfunction	Comply with CDM Regulations	In Place	
						Unplanned interaction with recreational/fishing craft			
						Communication failure - Personnel			
						Adverse weather conditions			
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Restricted visibility			
						Failure to follow passage plan			
						Inadequate training/competence - Personnel			
3	**People**	4	5	**People**	1	AIS failure			
	Property Damage	4		**Property Damage**	1	Notice to Mariners failure to observe			
	Planet	2		**Planet**	0	Excessive vessel speed			
	Business Continuity	4		**Business Continuity**	0	Navigation equipment failure			
Risk Ranking	**5.63**	Intolerable People	Tolerable Property	Tolerable Planet	Intolerable Port Business	Incorrect assessment of tidal flow/current			
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk							**Future Controls**		
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Notification of works, timing, etc to local communities	Future	
							Temporary marking of structures (AtoN)	Future	
2	**People**	4	4	**People**	1		Notice to Mariners and Works 'Point of Contact'	Future	
	Port Infrastructure	4		**Port Infrastructure**	1		Notification of works, timing, etc to local communities	Future	
	Planet	2		**Planet**	0		Safety boat during marine works	Future	
	Port Business	4		**Port Business**	0				
Risk Ranking	**4.75**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Marine Works craft with ferry on swing mooring			Risk Reference	06	Hazard Category	Collision
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Collision of a marine works craft (dredge/construction vessel) with the ferry on the swing mooring. Vessel dislodged from mooring causing it to drift and ground in Loch Linne, damage to both vessels requires survey and repair, minor injuries from impact, no pollution, delays to construction activities and ferry route out of services until vessel repaired or alternative vessel provided.			Minor collision at slow speed during manoeuvring results in minor damage to both vessels. No injuries, no pollution, no delay to activities.			Scheduling conflict	Passage planning	In Place	
						Human error/fatigue - Construction personnel	Safety Management System	In Place	
						Inadequate bridge resource management	Domestic Safety Management System (DSM)	In Place	
						Inadequate procedures in place onboard vessel	Ferry Operations Manual & Safety Management System	In Place	
						Vessel breakdown or malfunction	Contractor Risk Assessment Method Statement (RAMS)	In Place	
						Unplanned interaction with recreational/fishing craft	Regular Contractor Audits (of works vessels)	In Place	
						Communication failure - Personnel			
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Adverse weather conditions			
						Restricted visibility			
2	**People**	1	4	**People**	0	Failure to follow passage plan			
	Property Damage	3		**Property Damage**	1	Inadequate training/competence - Personnel			
	Planet	2		**Planet**	0	AIS failure			
	Business Continuity	4		**Business Continuity**	1	Notice to Mariners failure to observe			
Risk Ranking	**4.50**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business	Excessive vessel speed			
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business	Navigation equipment failure			
Future Risk							**Future Controls**		
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			All dredge/construction vessels, including barges to carry AIS (A or B)	Future	
							Temporary marking of structures (AtoN)	Future	
2	**People**	1	4	**People**	0				
	Port Infrastructure	3		**Port Infrastructure**	1				
	Planet	2		**Planet**	0				
	Port Business	4		**Port Business**	1				
Risk Ranking	**4.50**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Tug and tow collision with fishing/rec/aquaculture vessel			Risk Reference	07	Hazard Category	Collision
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Tug and tow (transporting material by barge) on transit in the Sound of Iona collision with recreational/fishing vessel. Recreational/fishing vessel holed and sinks in deep water. Multiple fatalities, pollution (Tier 2). Disruption to marine works meaning temporary suspension of operations.			Vessels make contact whilst taking avoiding action, glancing blow resulting in minor damage to both vessels. Vessels proceed to nearest suitable berth to assess damage. Minor injury to crew, no pollution, minor disruption to operations.			Human error/fatigue - Vessel Personnel	Passage planning	In Place	
						Inadequate procedures in place onboard vessel	Emergency services equipment - shore side	In Place	
						Vessel breakdown or malfunction	Vessel's emergency response procedures	In Place	
						Towing equipment failure	Safety Management System	In Place	
						Communication failure - Operational/procedural			
						Adverse weather conditions			
						Restricted visibility			
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Failure to follow passage plan			
						Inadequate training/competence - Personnel			
2	**People**	4	4	**People**	1	AIS failure			
	Property Damage	4		**Property Damage**	1	Incorrect assessment of tidal flow/current			
	Planet	3		**Planet**	0				
	Business Continuity	4		**Business Continuity**	1				
Risk Ranking	**5.13**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Notification of works, timing, etc to local communities	Future	
							Temporary marking of structures (AtoN)	Future	
1	**People**	4	3	**People**	1		Notice to Mariners and Works 'Point of Contact'	Future	
	Port Infrastructure	4		**Port Infrastructure**	1		Notification of works, timing, etc to local communities	Future	
	Planet	3		**Planet**	0				
	Port Business	4		**Port Business**	1				
Risk Ranking	**4.19**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Dredger to and from disposal site			Risk Reference	08	Hazard Category	Collision
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Dredger (transporting material) to or from the designated disposal site collides with ferry/tour boat. Ferry/tour boat (carrying passengers) holed and sinks in deep water. Loss of life, pollution (Tier 2). Disruption to marine works meaning temporary suspension of operations, and international adverse publicity.			Collision occurs in deep water between disposal site and project site. Vessels make contact whilst taking avoiding action, glancing blow resulting in minor damage to both vessels. Vessels proceed to nearest suitable berth to assess damage. Minor injury to crew/passengers, no pollution, no disruption to operations.			Human error/fatigue - Vessel Personnel	Standing Orders/SOPs	In Place	
						Inadequate bridge resource management	Vessel's emergency response procedures	In Place	
						Inadequate procedures in place onboard vessel	Safety Management System	In Place	
						Vessel breakdown or malfunction	Vessel maintenance	In Place	
						Unplanned interaction with recreational/fishing craft			
						Towing equipment failure			
						Communication failure - Operational/procedural			
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Communication failure - Personnel			
						Adverse weather conditions			
2	**People**	4	5	**People**	1	Restricted visibility			
	Property Damage	4		**Property Damage**	1	Interaction with passing vessel			
	Planet	3		**Planet**	0	Failure to follow passage plan			
	Business Continuity	4		**Business Continuity**	1	Inadequate training/competence - Personnel			
Risk Ranking	**5.56**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business	AIS failure			
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business	Unplanned interaction with ferry/tour boat			
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Notification of works, timing, etc to local communities	Future	
							Notice to Mariners and Works 'Point of Contact'	Future	
1	**People**	4	5	**People**	1				
	Port Infrastructure	4		**Port Infrastructure**	1				
	Planet	3		**Planet**	0				
	Port Business	3		**Port Business**	1				
Risk Ranking	**5.00**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Dredge/construction plant on-board fire			Risk Reference	09	Hazard Category	Fire/Explosion
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Fire on-board the dredge/construction vessel. Fire makes the vessel inoperative, multiple fatalities, minor pollution (Tier 1) from fire fighting products and run off, vessel laid up or removed from service. Disruption to the marine works.			Fire is contained by ships crew, resulting in localised damage to vessel on-board equipment. Minor injury, no pollution, vessel operational capability unaffected. Minor disruption to the marine works.			Human error/fatigue - Construction personnel	Emergency services equipment - shore side	In Place	
						Inadequate procedures in place onboard vessel	Standing Orders/SOPs	In Place	
						Fire/Explosion	Vessel's emergency response procedures	In Place	
						Vessel breakdown or malfunction	Contractor risk assessment method statement (RAMS)	In Place	
							Safety Management System	In Place	
							Comply with CDM Regulations	In Place	
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**					
2	**People**	4	4	**People**	1				
	Property Damage	4		**Property Damage**	1				
	Planet	2		**Planet**	0				
	Business Continuity	3		**Business Continuity**	0				
Risk Ranking	**4.69**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**					
2	**People**	4	4	**People**	1				
	Port Infrastructure	4		**Port Infrastructure**	1				
	Planet	2		**Planet**	0				
	Port Business	3		**Port Business**	0				
Risk Ranking	**4.69**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Dredger flooding whilst engaged in operations			Risk Reference	10	Hazard Category	Flooding
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Ingress of water due to weld failure, sea valve failure, hatches/ramps not secure, affects vessel stability leading to vessel sinking. Loss of life, pollution (Tier 2), navigation hazard disrupting operations, major adverse publicity.			Ingress of water controlled before vessel stability affected. Operations delayed until investigation/repairs completed.			Human error/fatigue - Vessel Personnel	Standing Orders/SOPs	In Place	
						Inadequate procedures in place onboard vessel	Vessel maintenance	In Place	
						Loss of watertight integrity	Vessel inspection/survey	In Place	
						Vessel breakdown or malfunction	Safety Management System	In Place	
						Communication failure - Personnel	Domestic Safety Management System (DSM)	In Place	
						Vessel Ramps or Hatches not secure	Contractor Risk Assessment Method Statement (RAMS)	In Place	
						Inadequate maintenance/inspection	Regular Contractor Audits (of works vessels)	In Place	
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**			Comply with CDM Regulations	In Place	
2	**People**	4	4	**People**	0				
	Property Damage	4		**Property Damage**	2				
	Planet	3		**Planet**	0				
	Business Continuity	4		**Business Continuity**	2				
Risk Ranking	**5.19**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**					
2	**People**	4	4	**People**	0				
	Port Infrastructure	4		**Port Infrastructure**	2				
	Planet	3		**Planet**	0				
	Port Business	4		**Port Business**	2				
Risk Ranking	**5.19**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Dredger grounding whilst engaged in operations			Risk Reference	11	Hazard Category	Grounding
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Dredger grounds whilst dredging. Drag head and pipe damaged, hull holed causing ingress of water, pollution (Tier 2), disruption to marine works and adverse publicity.			Dredger grounds, minor damage to drag head and pipe, plus damage to vessel hull from contact with the seabed. Vessel requires hull survey causing delay to marine works.			Human error/fatigue - Vessel Personnel	Availability of latest hydrographic information	In Place	
						Inadequate procedures in place onboard vessel	Standing Orders/SOPs	In Place	
						Loss of watertight integrity	Vessel's emergency response procedures	In Place	
						Vessel breakdown or malfunction	Safety Management System	In Place	
						Vessel has unreported defect			
						Communication failure - Personnel			
						Incorrect assessment of tidal flow/current			
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Adverse weather conditions			
3	**People**	0	5	**People**	0				
	Property Damage	2		**Property Damage**	1				
	Planet	0		**Planet**	0				
	Business Continuity	3		**Business Continuity**	1				
Risk Ranking	**4.44**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**					
3	**People**	0	5	**People**	0				
	Port Infrastructure	2		**Port Infrastructure**	1				
	Planet	0		**Planet**	0				
	Port Business	3		**Port Business**	1				
Risk Ranking	**4.44**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Accidental spill during works			Risk Reference	12	Hazard Category	Hazardous sub.
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Pollution from marine incident or accidental spill during construction phase leading to Tier 2 response. For example split hose or pipe on construction craft. No effect to other nearby vessels.			Pollution from accidental spill during construction phase leading to Tier 1 response. For example, from refuelling machinery on marine plant such as generators, compressors or cranes. Contractors pollution response equipment deployed. No effect to other nearby vessels.			Human error/fatigue - Vessel Personnel	Oil spill contingency plans	In Place	
						Inadequate procedures in place onboard vessel	Tier 2 contractor	In Place	
						Vessel breakdown or malfunction	Safety Management System	In Place	
						Communication failure - Personnel	Comply with CDM Regulations	In Place	
						Failure to comply with safe systems of work	Contractor Risk Assessment Method Statement (RAMS)	In Place	
						Inadequate marine procedures - Project			
						Inadequate maintenance/inspection			
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Inadequate training/competence - Personnel			
4	**People**	0	5	**People**	0				
	Property Damage	0		**Property Damage**	0				
	Planet	3		**Planet**	1				
	Business Continuity	3		**Business Continuity**	1				
Risk Ranking	**4.88**	Tolerable People	Tolerable Property	Tolerable Planet	Intolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Contractor vessel pollution response equipment	Future	
							Safety boat during marine works	Future	
3	**People**	0	5	**People**	0		Notice to Mariners and Works 'Point of Contact'	Future	
	Port Infrastructure	0		**Port Infrastructure**	0		Notification of works, timing, etc to local communities	Future	
	Planet	3		**Planet**	1				
	Port Business	3		**Port Business**	1				
Risk Ranking	**4.50**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Weather conditions leading to marine safety problem			Risk Reference	13	Hazard Category	Other
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Strong North Easterly winds cause works crafts to become stranded against marine works with people onboard. Serious injuries to personnel, minor pollution, minor property damage and significant effect to port business			Server weather causes unpredictable winds and strong currents restricting the ability to follow the work schedule causing ongoing delays for the marine works.			Human error/fatigue - Vessel Personnel	Standing Orders/SOPs	In Place	
						Inadequate procedures in place onboard vessel	Vessel maintenance	In Place	
						Vessel breakdown or malfunction	Vessel inspection/survey	In Place	
						Communication failure - Personnel	Safety Management System	In Place	
						Failure to comply with safe systems of work	Domestic Safety Management System (DSM)	In Place	
						Inadequate marine procedures - Project	Contractor Risk Assessment Method Statement (RAMS)	In Place	
						Inadequate maintenance/inspection	Regular Contractor Audits (of works vessels)	In Place	
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Inadequate training/competence - Personnel			
						Adverse weather conditions			
2	**People**	3	5	**People**	0				
	Property Damage	3		**Property Damage**	0				
	Planet	1		**Planet**	0				
	Business Continuity	4		**Business Continuity**	1				
Risk Ranking	**4.56**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Safety boat during marine works	Future	
							Monitoring of weather/wave conditions	Future	
1	**People**	3	5	**People**	0				
	Port Infrastructure	3		**Port Infrastructure**	0				
	Planet	1		**Planet**	0				
	Port Business	4		**Port Business**	1				
Risk Ranking	**4.06**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Contact with Subsea powerline, anchoring/dredging			Risk Reference	14	Hazard Category	Other
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Dredger operating in close proximity to Subsea Power Cables hits the cable with the draghead, or a vessel associated with the marine works anchors in an emergency situation and the anchor drags over the cable snagging it. No damage to dredger, no pollution, significant disruption to marine works whilst cable and vessel are released. Cable severly damage and requires replacement. Adverse publicity.			Dredger or other vessel drops anchor in proximity to Subsea Power Cables and snaggs a power cable, lifts cable or becomes immobilied. Contractors are able to move cable without breaking the cable or damaging the vessel causing delays to marine works.			Human error/fatigue - Vessel Personnel	Emergency services equipment - shore side	In Place	
						Adverse weather conditions	Safe systems of work (H&S)	In Place	
						Failure to comply with safe systems of work	Contractor risk assessment method statement (RAMS)	In Place	
						Inadequate marine procedures - Project	Safety Management System	In Place	
						Inadequate training/competence - Personnel	Domestic Safety Management System (DSM)	In Place	
						Manoeuvre misjudged	Ferry Operations Manual & Safety Management System	In Place	
							Comply with CDM Regulations	In Place	
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**					
3	**People**	0	4	**People**	0				
	Property Damage	3		**Property Damage**	0				
	Planet	0		**Planet**	0				
	Business Continuity	3		**Business Continuity**	1				
Risk Ranking	**3.81**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Power cable owner to supply details plans of cable locations	Future	
							Liaison point between Power Cable owners and site contractors	Future	
2	**People**	0	3	**People**	0		Creation of detailed emergency plan in case of cable snagging	Future	
	Port Infrastructure	3		**Port Infrastructure**	0				
	Planet	0		**Planet**	0				
	Port Business	3		**Port Business**	1				
Risk Ranking	**3.13**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Strong Tidal currents – construction craft			Risk Reference	15	Hazard Category	Other
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Construction craft are unaware of strong currents throughout the Corran Narrows and Loch Linnhe causing disruption during operations. A construction craft grounds whilst transiting to or from the site causing ingress of water, pollution (Tier 2), disruption to marine works and adverse publicity.			Construction craft grounds, minor damage to vessel hull from contact with the seabed. Vessel requires hull survey causing delay to marine works.			Human error/fatigue - Vessel Personnel	Availability of latest hydrographic information	In Place	
						Inadequate procedures in place onboard vessel	Standing Orders/SOPs	In Place	
						Loss of watertight integrity	Vessel's emergency response procedures	In Place	
						Vessel breakdown or malfunction	Safety Management System	In Place	
						Vessel has unreported defect	Availability of tidal information and tidal flow characteristics	In Place	
						Communication failure - Personnel			
						Incorrect assessment of tidal flow/current			
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Adverse weather conditions			
2	**People**	3	4	**People**	0				
	Property Damage	3		**Property Damage**	1				
	Planet	3		**Planet**	0				
	Business Continuity	4		**Business Continuity**	1				
Risk Ranking	**4.69**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**					
2	**People**	3	4	**People**	0				
	Port Infrastructure	3		**Port Infrastructure**	1				
	Planet	3		**Planet**	0				
	Port Business	4		**Port Business**	1				
Risk Ranking	**4.69**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Incorrect payload distribution/stability affected by load			Risk Reference	16	Hazard Category	Payload related
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Barge is loaded/unloaded incorrectly, causing instability and capsize of vessel. Loss of vessel, loss of life if barge manned, pollution (Tier 1), navigation hazard created by the sunk vessel, delays to marine construction programme.			Barge takes on list during unloading. Operations cease and barge unloaded causing delays.			Human error/fatigue - Vessel Personnel	Emergency services equipment - shore side	In Place	
						Adverse weather conditions	Safe systems of work (H&S)	In Place	
						Failure to comply with safe systems of work	Contractor risk assessment method statement (RAMS)	In Place	
						Inadequate marine procedures - Project	Safety Management System	In Place	
						Inadequate training/competence - Personnel	Comply with CDM Regulations	In Place	
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**					
2	**People**	4	5	**People**	1				
	Property Damage	1		**Property Damage**	0				
	Planet	0		**Planet**	0				
	Business Continuity	4		**Business Continuity**	0				
Risk Ranking	**4.31**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**					
2	**People**	4	5	**People**	1				
	Port Infrastructure	1		**Port Infrastructure**	0				
	Planet	0		**Planet**	0				
	Port Business	4		**Port Business**	0				
Risk Ranking	**4.31**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

D Hazard Log: Operation

Hazard Scenario Title			Overnight berthing			Risk Reference	01	Hazard Category	Accident to pers.
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Man overboard (MoB) whilst berthing or approaching/departing the overnight berth, MoB hits head on the vessel leading to drowning. No pollution, minor delay to operations.			MoB recovered to shore and treated for cold water immersion. No pollution, minor delay to operations.			Human error/fatigue - Vessel Personnel	Communications equipment	In Place	
						Inadequate procedures in place onboard vessel	Safe systems of work (H&S)	In Place	
						Unplanned interaction with recreational/fishing craft	Emergency services equipment - shore side	In Place	
						Communication failure - Operational/procedural	Safety Management System	In Place	
						Communication failure - Personnel	Vessel's emergency response procedures	In Place	
						Adverse weather conditions	Domestic Safety Management System (DSM)	In Place	
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Failure to comply with safe systems of work	Ferry Operations Manual & Safety Management System	In Place	
						Non-attendance of boatmen			
						Risk Assessment, Incomplete/not reviewed			
	People	3		**People**	1	Inadequate marine procedures - Project			
2	**Property Damage**	0	5	**Property Damage**	0	Inadequate training/competence - Personnel			
	Planet	0		**Planet**	0				
	Port Business	3		**Port Business**	1				
Risk Ranking	**4.13**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Controls						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Update to THC Corran Ferry Management System	Future	
							Update to shoreside facility maintenance programme	Future	
	People	3		**People**	1		Update to THC berthing procedures for overnight at Ardgour	Future	
2	**Port Infrastructure**	0	4	**Port Infrastructure**	0		Safety lighting, commensurate with British Standard 5489-1	Future	
	Planet	0		**Planet**	0				
	Port Business	3		**Port Business**	1				
Risk Ranking	**3.75**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Ferry boat allision with breakwater			Risk Reference	02	Hazard Category	Allision
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Ferry or tour boat makes heavy contact with the breakwater on approach. Hull punctured leading to extensive flooding and vessel sinking. Multiple fatalities, pollution (Tier 2), national adverse publicity. Operations cease until wreck can be recovered.			Ferry or tour boat makes contact with breakwater on approach at slow speed causing minor damage to vessel hull. Minor injuries to passengers and crew, no pollution, vessel out of service until survey and repairs made.			Human error/fatigue - Vessel Personnel	Passage planning	In Place	
						Inadequate bridge resource management	Oil spill contingency plans	In Place	
						Inadequate procedures in place onboard vessel	Tier 2 contractor	In Place	
						Vessel breakdown or malfunction	Communications equipment	In Place	
						Unplanned interaction with recreational/fishing craft	Aids to navigation, Provision & maintenance of	In Place	
						Adverse weather conditions	Emergency services equipment - shore side	In Place	
						Restricted visibility	Safety Management System	In Place	
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Limited area for manoeuvring	Weather forecasting	In Place	
						Failure of Aid to Navigation (out of position/unlit)	Vessel's emergency response procedures	In Place	
	People	4		**People**	1	Incorrect assessment of tidal flow	Domestic Safety Management System (DSM)	In Place	
2	**Property Damage**	3	5	**Property Damage**	1	Failure to follow passage plan	Ferry Operations Manual & Safety Management System	In Place	
	Planet	3		**Planet**	0	Inadequate training/competence - Personnel			
	Business Continuity	3		**Business Continuity**	1	Excessive vessel speed			
Risk Ranking	**5.44**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business	Reduction in safe navigable space			
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business	Manoeuvre misjudged			
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Additional AtoN on breakwater	Future	
							Relocation of NLB Sector Light (AtoN)	Future	
	People	4		**People**	1		Update to THC Corran Ferry Management System	Future	
2	**Port Infrastructure**	3	4	**Port Infrastructure**	1		Update to shoreside facility maintenance programme	Future	
	Planet	3		**Planet**	0				
	Port Business	3		**Port Business**	1				
Risk Ranking	**5.00**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Recreational/fishing vessel allision with marine works			Risk Reference	03	Hazard Category	Allision
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Recreational or fishing vessel makes heavy impact with the breakwater. Impact causes vessel to be holed leading to serious injury to crew, and significant damage to the vessel. Limited pollution (Tier 1), vessel stranded on breakwater resulting in delays to operations until vessel recovered.			Recreational or fishing vessel makes contact with the breakwater at slow speed causing vessel damage, leading to minor injury to crew, no pollution.			Human error/fatigue - Vessel Personnel	Oil spill contingency plans	In Place	
						Vessel breakdown or malfunction	Tier 2 contractor	In Place	
						Unplanned interaction with recreational/fishing craft	Aids to navigation, Provision & maintenance of	In Place	
						Adverse weather conditions	Emergency services equipment - shore side	In Place	
						Restricted visibility	Safety Management System	In Place	
						Failure to observe standing notices	Weather forecasting	In Place	
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Increased vessel use			
						Limited area for manoeuvring			
						Failure of Aid to Navigation (out of position/unlit)			
2	**People**	2	5	**People**	1	Incapacitated master (drinks/drugs)			
	Property Damage	2		**Property Damage**	1	Incorrect assessment of tidal flow			
	Planet	2		**Planet**	0	Inadequate training/competence - Personnel			
	Business Continuity	3		**Business Continuity**	1	Excessive vessel speed			
Risk Ranking	**4.94**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business	Reduction in safe navigable space			
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business	Manoeuvre misjudged			
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Additional AtoN on breakwater	Future	
							Relocation of NLB Sector Light (AtoN)	Future	
2	**People**	2	4	**People**	1		Update to shoreside facility maintenance programme	Future	
	Port Infrastructure	2		**Port Infrastructure**	1		Safety lighting, commensurate with British Standard 5489-1	Future	
	Planet	2		**Planet**	0				
	Port Business	3		**Port Business**	1				
Risk Ranking	**4.50**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Small non-powered craft displaced by breakwater/slipway/overnight pier			Risk Reference	04	Hazard Category	Collison
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Displacement of small non-powered craft (e.g. kayaks) into deeper water due to breakwater presence and loss of line-of-sight for tour boat or ferry transiting across the Narrows. Non-powered craft holed and sinks, loss of life, no pollution. Adverse publicity.			Displacement of small non-powered craft (e.g. kayaks) into deeper water due to breakwater presence, loss of line-of-sight for non-powered craft with larger craft moving in the area due to the breakwater size. Capsize of non-powered craft, minor injury (hypothermia), rescued by emergency services or local craft. No pollution, adverse publicity.			Unplanned interaction with recreational/fishing craft	Aids to navigation, Provision & maintenance of	In Place	
						Restricted visibility	Emergency services equipment - shore side	In Place	
						Increased vessel use			
						Limited area for manoeuvring			
						Human error			
						Competence			
						Reduction in safe navigable space			
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**					
3	**People**	4	5	**People**	1				
	Property Damage	1		**Property Damage**	1				
	Planet	0		**Planet**	0				
	Business Continuity	4		**Business Continuity**	1				
Risk Ranking	**5.50**	Intolerable People	Tolerable Property	Tolerable Planet	Intolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Additional AtoN on breakwater	Future	
							Relocation of NLB Sector Light (AtoN)	Future	
2	**People**	4	4	**People**	1		Notification to UKHO regarding new structures	Future	
	Port Infrastructure	1		**Port Infrastructure**	1		Targetted information distribution to user groups by THC	Future	
	Planet	0		**Planet**	0				
	Port Business	4		**Port Business**	1				
Risk Ranking	**4.63**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Ferry collides with other vessels			Risk Reference	05	Hazard Category	Collison
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Ferry collides with recreational or fishing vessel head-on whilst manoeuvring on/ off of a berth. Potential for fatal or Serious injuries to recreational users, tier 2 pollution, Moderate damage to property, Serious damage to port business from vessel sinking in entrance			Glancing blow between ferry and recreational vessel. Minor injuries, minor property damage, no pollution, no damage to port business			Human error/fatigue - Vessel Personnel	Oil spill contingency plans	In Place	
						Vessel breakdown or malfunction	Tier 2 contractor	In Place	
						Unplanned interaction with recreational/fishing craft	Aids to navigation, Provision & maintenance of	In Place	
						Adverse weather conditions	Emergency services equipment - shore side	In Place	
						Restricted visibility	Safety Management System	In Place	
						Failure to observe standing notices	Weather forecasting	In Place	
						Increased vessel use	Domestic Safety Management System (DSM)	In Place	
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Limited area for manoeuvring	Ferry Operations Manual & Safety Management System	In Place	
						Failure of Aid to Navigation (out of position/unlit)			
2	**People**	4	5	**People**	1	Incapacitated master (drinks/drugs)			
	Property Damage	3		**Property Damage**	1	Incorrect assessment of tidal flow			
	Planet	3		**Planet**	0	Inadequate training/competence - Personnel			
	Business Continuity	3		**Business Continuity**	0	Excessive vessel speed			
Risk Ranking	**5.06**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business	Reduction in safe navigable space			
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business	Manoeuvre misjudged			
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Relocation of NLB Sector Light (AtoN)	Future	
							Additional AtoN on breakwater	Future	
1	**People**	4	4	**People**	1		Update to THC Corran Ferry Management System	Future	
	Port Infrastructure	3		**Port Infrastructure**	1		Update to shoreside facility maintenance programme (Owner)	Future	
	Planet	3		**Planet**	0		Update to THC passage plan	Future	
	Port Business	3		**Port Business**	0		Update to THC berthing procedures for overnight at Ardgour	Future	
Risk Ranking	**4.19**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business		Targetted information distribution to user groups by THC	Future	
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Any vessel, post construction seabed change or debris			Risk Reference	06	Hazard Category	Grounding
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Vessel grounds on materials dropped during the construction of the breakwater/slipway. Rock penetrates the hull resulting in flooding, vessel requires survey and repair, potential for minor pollution (Tier 1).			Breakwater construction, dredge works and changes to localised flow patterns lead to depth changes post-construction (scour, deposit, accidental material left from construction works). Grounding of a vessel on accumulated sediment, delay to operations as vessels requires checks for damage			Human error/fatigue - Vessel Personnel	Passage planning	In Place	
						Human error/fatigue - Construction personnel	Dredging programme	In Place	
						Inadequate bridge resource management	Oil spill contingency plans	In Place	
						Inadequate procedures in place onboard vessel	Tier 2 contractor	In Place	
						Communication failure - Personnel	Vessel's emergency response procedures	In Place	
						Adverse weather conditions	Safety Management System	In Place	
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Increased vessel use			
						Limited area for manoeuvring			
						Incorrect assessment of tidal flow/current			
2	**People**	2	4	**People**	1	Human error			
	Property Damage	3		**Property Damage**	1	Competence			
	Planet	2		**Planet**	0	Inadequate surveying			
	Business Continuity	4		**Business Continuity**	1	Reduction in safe navigable space			
Risk Ranking	**4.88**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business	Manoeuvre misjudged			
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Bathymetric survey	Future	
1	**People**	2	3	**People**	1				
	Port Infrastructure	3		**Port Infrastructure**	1				
	Planet	2		**Planet**	0				
	Port Business	4		**Port Business**	1				
Risk Ranking	**3.94**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

Hazard Scenario Title			Maintenance dredging incidents			Risk Reference	07	Hazard Category	Grounding
Worst Credible Scenario			**Most Likely Scenario**			**Causes**	**Control**	**Completeness**	**Comment**
Dredger operating to redredge new berth pockets runs aground and is unable to be refloated under own power, Vessel holed requiring survey and repair, potential for minor pollution (Tier 1). Delay to ferry operation whilst dredger insitu.			Maintenance dredger grounds and is able to refloat, continue work, minor delay to operation no pollution injuries or damage to port business.			Human error/fatigue - Vessel Personnel	Passage planning	In Place	
						Human error/fatigue - Construction personnel	Dredging programme	In Place	
						Inadequate bridge resource management	Oil spill contingency plans	In Place	
						Inadequate procedures in place onboard vessel	Tier 2 contractor	In Place	
						Communication failure - Personnel	Vessel's emergency response procedures	In Place	
						Adverse weather conditions	Safety Management System	In Place	
						Increased vessel use			
Embedded Worst Credible Frequency	**Embedded Worst Credible Consequence**		**Embedded Most Likely Frequency**	**Embedded Most Likely Consequence**		Limited area for manoeuvring			
						Incorrect assessment of tidal flow			
2	**People**	2	4	**People**	1	Human error			
	Property Damage	3		**Property Damage**	1	Competence			
	Planet	2		**Planet**	0	Inadequate surveying			
	Business Continuity	4		**Business Continuity**	1	Reduction in safe navigable space			
Risk Ranking	**4.88**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business	Manoeuvre misjudged			
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Future Risk						**Future Controls**			
Worst Credible Frequency	**Worst Credible Consequence**		**Most Likely Frequency**	**Most Likely Consequence**			Bathymetric survey	Future	
1	**People**	2	3	**People**	1				
	Port Infrastructure	3		**Port Infrastructure**	1				
	Planet	2		**Planet**	0				
	Port Business	4		**Port Business**	1				
Risk Ranking	**3.94**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				
Tolerability	**Tolerable**	Tolerable People	Tolerable Property	Tolerable Planet	Tolerable Port Business				

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