



Staffin Community Harbour Development

Construction Environmental Management Document

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Staffin Community Harbour

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1 Introduction

This Construction Environmental Management Document (CEMD) has been developed to ensure that during the construction of the Staffin Community Harbour Development, appropriate mitigation is implemented to minimise environmental impacts. The mitigation outlined as part of this CEMD aligns with the Environmental Impact Assessment Report (Affric Limited, 2021), Marine Licence, and relevant Planning Consents. It sets out the various mitigation, guidance and policy requirements of the project.

Specific mitigation plans/protocols designed for the Staffin Community Harbour includes:

- Construction Environmental Management Plan
- Site Waste, Materials and Plant Management Plan;
- Protocol for Archaeological Discoveries;
- Protocol for Geological/Paleontological Discoveries;
- Water Management Plan for the Lealt Borrow Pit;
- Pollution Prevention Plan (PPP);
- Oil Spill Contingency Plan;
- Dust Management Plan;
- Noise & Vibration – including a Blasting Method Statement;
- Public Access, Construction Traffic & Navigational Management Plan; and
- Habitat and Species Protection Plan.

1.1 Implementation

The implementation of the CEMD will be through risk assessment method statements (RAMS), the construction contractor's environmental management system, and the direct application of Construction Environmental Management Plans (CEMPs) identified within this document.

As discussed in detail in Section 1.2, this CEMD allows for onshore works and land reclamation activities. **No works on the breakwater will be carried out until this document has been updated and agreed by Marine Directorate and their statutory consultees.**

1.2 Updates

The CEMD is a live document and will be regularly updated as discussed in Section 4: Document Control Process. There will be a review prior to the start of each new phase of construction to ensure the document remains fit for purpose.

Note that this CEMD has been amended to cover all marine aspects of the works, in line with Marine Licence MS-00009582 and was submitted for approval on the 4th December 2023. Marine Directorate and their respective consultees have since confirmed that Phase 1 of the works (as described in Section 6.3: Land Reclamation) can progress and implement all relevant mitigation measures within the CEMD. However, prior to any further construction works in the marine environment, the CEMD must be resubmitted to Marine Directorate for approval prior to Phase 2 construction works (as described in Sections 6.4-6.6).



1.3 References

Affric Limited. (2021). Staffin Community Harbour Environmental Impact Assessment Report. October 2021.



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2 Background

2.1 Consents and Licensing

The Staffin Community Harbour development is consented under the Marine (Scotland) Act 2010 to facilitate the removal of the existing breakwater, construction of a new breakwater and slipway, the installation of the pontoons, extension of the existing hardstanding through land reclamation and installation of utilities carried out below Mean High-Water Spring (MHWS) (MS-00009582).

Works above the Mean Low Water Spring (MLWS) are consented under the Town and Country Planning (Scotland) Act 1997 for portions of the proposed breakwater and slipway, extended hardstanding, car parking area, buildings, storage units, oil storage facilities (Planning Consent 21/04521/FUL) and operations at the Lealt Borrow Pit (Planning Consent 21/04525/FUL).

2.2 Basis

The main aspects of the CEMD have been extracted from the Staffin Community Harbour Environmental Impact Assessment Report (EIAR) (Affric Limited, 2021) produced to support the marine licence application and the planning application. Further detail, including the basis and reasoning behind the mitigation outlined in this document, is provided in the EIAR.

Mitigation to avoid and minimise potential environmental impacts associated with the Staffin Community Harbour aligns to current industry best practice and the following guidance documents:

- Construction Environmental Management Process for Large Scale Projects (The Highland Council, 2010);
- GPP 1: A General Guide to Preventing Pollution (NIEA, SEPA, & Natural Resources Wales, 2020);
- GPP 5: Works and Maintenance in or Near Water (NIEA, SEPA, & Natural Resources Wales, 2018a);
- GPP 6: Working at Construction and Demolition Sites (Environmental Agency, NIEA, & SEPA, 2023);
- PPG 7: Safe Storage – The Safe Operation of Refuelling Facilities (NIEA, SEPA, & Environment Agency, 2011);
- GPP 21: Pollution Incident Response Planning (NIEA, SEPA, & Natural Resources Wales, 2021);
- GPP 22: Dealing with Spills (NIEA, SEPA, & Natural Resources Wales, 2018b);
- GPP 26: Safe Storage of Drums and Intermediate Bulk Containers (NIEA, SEPA, & Natural Resources Wales, 2021);
- Alien Invasive Species and the Oil and Gas Industry Guidance for Prevention and Management (IPIECA & OGP, 2010);
- Joint Nature Conservation Committee (JNCC), Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise (Joint Nature Conservation Committee, 2010);



- BS EN 5228- 1:3009 + A1 2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites (British Standards Institute, 2014);
- Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2023);
- Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites (IAQM, 2018);
- CIRIA: Coastal and Marine Environmental Site Guide (CIRIA, 2015);
- Planning for Transport: Planning Advice Note – PAN 75 (Scottish Executive, 2005).



2.3 References

- Affric Limited. (2021). Staffin Community Harbour Environmental Impact Assessment Report. October 2021.
- British Standards Institute. (2014). *BS EN 5228-1:2009 +A1 2014: Code of practice for noise and vibration control on construction and open sites*. London, UK: British Standards Institute.
- CIRIA. (2015). Coastal and marine environmental site guide In (pp. 180): CIRIA.
- Environmental Agency, NIEA, & SEPA. (2023). *GPP 6: Work at Construction and Demolition Sites*. Retrieved from [gpp6-working-on-construction-and-demolition-sites.pdf \(netregs.org.uk\)](https://www.netregs.org.uk/gpp6-working-on-construction-and-demolition-sites.pdf).
- IAQM. (2018). *Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites*. Retrieved from [guidance_monitoring_dust_2018.pdf \(iaqm.co.uk\)](https://www.iaqm.co.uk/guidance_monitoring_dust_2018.pdf).
- IAQM. (2023). *Guidance on the Assessment of Dust from Demolition and Construction* Retrieved from [Construction-dust-2023-BG-v6-amendments.pdf \(iaqm.co.uk\)](https://www.iaqm.co.uk/Construction-dust-2023-BG-v6-amendments.pdf).
- IPIECA, & OGP. (2010). *Alien invasive species and the oil and gas industry: Guidance for prevention and management*. Retrieved from London, UK.
- Joint Nature Conservation Committee. (2010). Statutory Nature Conservation Agency Protocol for Minimising the Risk of Injury to Marine Mammals from Piling Noise. Retrieved from .
- NIEA, SEPA, & Environment Agency. (2011). The safe operation of refuelling facilities: PPG7. In (pp. 1-30): NIEA, SEPA and Environment Agency. Retrieved from <http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/>.
- NIEA, SEPA, & Natural Resources Wales, (2021). *GPP 21: Pollution Incident Response Planning*.
- NIEA, SEPA, & Natural Resources Wales, (2018a). *GPP5: Works and Maintenance in or Near Water*.
- NIEA, SEPA, & Natural Resources Wales. (2018b). *GPP 22: Dealing with spills*.
- NIEA, SEPA, & Natural Resources Wales, (2021). *GPP 26: Safe Storage of Drums and intermediate bulk containers*.
- NIEA, SEPA, & Natural Resources Wales, (2020). *GPP 1: A General Guide to Preventing Pollution*.
- Scottish Executive. (2005). Planning for Transport - Planning Advice Note - PAN 75. In (pp. 42): Scottish Executive.
- Scottish Executive. (2007). Controlling light pollution and reducing lighting energy consumption. In (pp. 38): Scottish Executive.
- SEPA, Environment Agency, & Environment and Heritage Service. (2000). PGG 18: Managing fire water and major spillages. In (pp. 6).
- The Highland Council. (2010). Construction Environmental Management Process for Large Scale Projects.



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3 Roles and Responsibilities

3.1 Environmental Management Structure

It is important to define roles with regards to environmental management to ensure that it is clear to all involved who is responsible for what, and that all issues are covered. This section details the various parties involved in the construction of the Staffin Community Harbour, and their responsibilities.

Descriptions of the various roles with regard to environmental management and training requirements are provided below.

Due to the timescale of this project, it is likely that there will be changes of personnel before the completion of the build. As such this chapter will refer to job titles only. A list of personnel and contact details can be found in Appendix 3A which will be updated as necessary throughout the project.

3.2 Key Environmental Roles and Responsibilities

3.2.1 Staffin Community Trust

3.2.1.1 Responsibility

Staffin Community Trust is the client organisation commissioning the works and is responsible for appointing the Principal Contractor, New Engineering Contract (NEC) Project Manager and Supervisor for the construction contract.

3.2.1.2 Duties

Specific environmental duties:

- Have overall responsibility for ensuring that all licence are in place and their requirements are being met.
- Ensure the CEMD is kept up to date.

3.2.1.3 Qualification

Staffin Community Trust's representatives should have an appropriate understanding of the licences, legal requirements and the CEMD.

3.2.2 Local Liaison Officer

3.2.2.1 Responsibility

The Local Liaison Officer will work with the Principal Contractor to ensure the community is informed of the activities taking place.

3.2.2.2 Duties

- Communication with local stakeholders including posting on local social media groups, posters and signage as deemed appropriate for the specific activity being undertaken.



- Manage communications regarding access to public footpaths.
- Manage communications regarding access to the slipway.
- Respond to any complaints and concerns raised by members on the public.

3.2.2.3 Qualification

The Local Liaison Officer in addition to having the appropriate local knowledge they should have an appropriate understanding of the CEMD and a basic understanding of how construction activities can affect the community.

3.2.3 NEC Project Manager and Supervisor

3.2.3.1 Responsibility

The NEC Project Manager and Supervisor are the main link between the Staffin Community Trust and the Principal Contractor. As such, they will be responsible for ensuring that the Principal Contractor implements appropriate mitigation, Risk Assessed Method Statements (RAMS), and other requirements as detailed within the CEMD and as requested by the ECoW.

3.2.3.2 Duties

Specific environmental duties include:

- To work with ECoW to update the CEMD as required.
- Ensure environmental matters are included within all regular progress and contract meetings, with minutes distributed to appropriate parties.
- To ensure environmental instructions are implemented appropriately by the Principal Contractor.
- To support the ECoW in any event that works need to be ceased for environmental reasons and work with them to resolve issues promptly to allow works to continue.

3.2.3.3 Qualification

The NEC Project Manager and Supervisor in addition to having the appropriate engineering and construction expertise should have an appropriate understanding of the licences, legal requirements, the CEMD, and mitigation measures for proposed construction.

3.2.4 Independent Archaeologist

3.2.4.1 Responsibility

Responsible for facilitating the implementation of the Written Scheme of Investigation (WSI).

3.2.4.2 Duties

- Reviewing output of relevant surveys.
- Physical examination of finds and producing the Archaeological Evaluation Report.
- Providing advice to the ECoW and Site Manager as required.



3.2.4.3 Qualifications

A member of the Chartered Institute for Archaeologists with relevant fieldwork experience.

3.2.5 Independent Geologist/Palaeontologist

3.2.5.1 Responsibility

To lead and coordinate the project's responsibility for geological and palaeontological interests.

3.2.5.2 Duties

- To fulfil the requirements of the relevant planning conditions.
- To ensure project personnel are supported through toolbox talks and *ad hoc* advice.
- To produce a watching brief to be undertaken (this has been completed).
- To undertake the watching brief.
- To ensure all monitoring and recording/reporting of any geological and/or palaeontological interest is completed in accordance with the brief.

3.2.5.3 Qualifications

The appointed 'independent and suitably experienced geologist' role as required by the planning consent conditions will be fulfilled by Geologist and Geotechnical Specialist within the UK quarrying and site investigation industry. Qualified with a degree in Geophysical Sciences and significant experience.

The geologist will be supported by a local palaeontological expert, with significant experience in fossil identification, safeguarding and reporting of important fossil finds within the Skye and Inner Hebrides region. See Appendix 8B for further details.

3.2.6 Principal Contractor Site Manager

3.2.6.1 Responsibility

To act as the main point of contact on site, on behalf of the Principal Contractor.

3.2.6.2 Duties

Environmental duties will include:

- Ensuring Principal Contractor's staff and resources including sub-contractors and suppliers are briefed in advance of their arrival to site of relevant logistics, biosecurity measures, access protocols, in addition to procedures required to implement the CEMD.
- Ensuring RAMS are provided to the Staffin Community Trust for review in a timely fashion, prior to the start of the relevant works.
- Ensuring implementation of:
 - Emergency response procedures;
 - Environmental site induction training;
 - Environmental Toolbox Talks; and



- Environmental incident response drills.
- Make all necessary arrangements for the correct storage and handling of materials.
- Carrying out regular checks to ensure that no environmental issues are arising, including but not limited to signs of water pollution, fugitive dust, and littering (this activity may be delegated).
- Ensure that construction personnel allocated for tasks are those with suitable skills and experience and recommend operatives for additional training to the Contracts Manager.

3.2.6.3 Qualifications

The Principal Contractors Site Manager in addition to having the appropriate engineering and construction expertise they should have an appropriate understanding of the CEMD and a basic understanding of how construction activities can affect the environment.

3.2.7 Environmental Clerk of Works (ECoW)

3.2.7.1 Responsibility

The ECoW will advise Staffin Community Trust and the NEC Project Manager and Supervisor if there are issues of non-compliance, and if they are of a scale that they would advise that works should be stopped, pending the issue or non-compliance being resolved. The ECoW is responsible for auditing compliance with the relevant consents, licences and legislation. They will also be available to provide advice remotely in event of an incident or unexpected condition arising. It should be noted that the ECoW will attend site when necessary and on a risk-based approach.

3.2.7.2 Duties

The ECoW duties will include:

- Carrying out regular documented inspections/audits of the site to ensure that all work are being carried out in compliance commitments made in the following documentation:
 - Environmental Impact Assessment Report; and
 - CEMD.
- Working closely with the Appointed Contractor's team to ensure that mitigation being implemented is effective.
- To maintain a watching brief with regard to ecological receptors, taking account of the season and planned construction works and locations.
- Recognise when a topic specific expert is required and call upon them to provide support, ensure their competence, and manage their activities on site.
- Deliver toolbox talks on ecological and environmental topics relevant to the stage or works.
- Produce environmental poster(s) as required for display within staff welfare facilities.
- Site attendance will be proportionate to the risk posed by the activities being undertaken.



- Off-site, on-call support will be provided during normal construction hours, to provide advice as required.
- Stopping work in event of a non-compliance, incident or unexpected condition arising which poses an imminent risk to the environment.

3.2.7.3 Qualification & Experience

The ECoW should be qualified to degree level (or equivalent) in an appropriate environmental, science or engineering discipline; and be a member of an appropriate Institute. The ECoW should have an appropriate level of understanding and experience to appropriately implement the CEMD and associated management plans including pollution prevention, waste and the CEMP. They will also have previous experience of carrying out audits. The ECoW should have access to topic specialists and know when to call upon them for additional support as required.

3.2.8 Independent Environmental Clerk of Works (IECoW)

The IECoW will oversee ECoW duties remotely, to ensure that audits are being conducted in line with the audit programme outlined in Section 5.

3.2.8.1 Duties

The IECoW duties will include:

- Reviewing Risk Assessment Method Statements (RAMs) and providing one round of comments to ensure compliance with the Construction Environmental Management Document (CEMD);
- Providing auditing material/templates covering relevant environmental topics to the ECoW;
- Maintaining a site actions log;
- Maintaining a licence conditions tracker that details conditions, their current status and actions that are required;
- Providing relevant toolbox talk material to the ECoW;
- Ensure the CEMD is up to date and carrying out updates;
- Have the authority/discretion to stop works, in the event of a non-compliance, incident or unexpected condition arising which poses an imminent risk to the environment;
- Prompt the ECoW to ensure compliance with the CEMD;
- Ensure communication pathways are appropriate during the works;
- Ensure Staffin Community Trusts interests are looked after with regard to environmental performance and commitments; and
- Provide ad hoc assistance to the ECoW during their site visits, should any potential issues be identified.

3.2.8.2 Qualification and Experience

The IECoW should be qualified to degree level (or equivalent) in an appropriate environmental, science or engineering discipline; and be a member of an appropriate Institute. The IECoW should have an appropriate level of understanding and experience to appropriately support



the ECoW. They will also have previous experience of carrying out audits within the IECoW context.

3.2.9 All Workers

3.2.9.1 Responsibility

Everyone on site should be empowered to raise concerns and if appropriate stop works on environmental grounds until the ECoW can review the situation.

3.2.9.2 Duties

All workers are expected to:

- Understand and sign the appropriate RAMS, for the work they are undertaking.
- Raise any queries or concerns with methods or mitigation measures prior to commencing tasks.
- Carry out works in line with the RAMS.
- Report all environmental incidents including spills to the site management team.
- Ensure good housekeeping is maintain on site, especially with regard to prevention of littering.

3.2.9.3 Qualifications

All workers must attend site induction, briefings and toolbox talks relevant to the works they are undertaking to ensure understanding of environmental as well as health and safety issues.



Appendix 3A – Details of Key Project Personnel

| Construction Environmental Management Document | |
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| Section Number | 3A |
| Section Title | Details of Key Project Personnel |
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| Role | Company | Name | Phone | Email |
|--|-----------------------------|------------------|------------|-------|
| Client Organisation | Staffin Community Trust | Hugh Ross | [Redacted] | |
| Local Liaison Officer | Staffin Community Trust LDO | Hugh Ross | | |
| NEC Project Manager | Wallace Stone LLP | Donald Armstrong | | |
| NEC Supervisor | Wallace Stone LLP | Donald Armstrong | | |
| Land Principal Contractor Site Manager | GF Job Ltd | Adrian Johnstone | | |
| Marine Principal Contractor Site Manager | TBC | TBC | | |
| Staffin Community Trust appointed Archaeologist | AOC | Mary Peteranna | | |
| Geologist | Dalgleish Associates Ltd | Michelle Latimer | | |
| Palaeontologist | - | Dugald Ross | | |
| ECoW | TBC | TBC | | |
| IECoW | TBC | TBC | | |



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4 Document Control Process

Each section of the CEMD includes an issue number and the date of update, along with the reason for update, on the front of the section. The ECoW will have overall responsibility for the document. The ECoW will ensure that the most current version of the document is provided in electronic form to:

- The Staffin Community Harbour Trust Developments Manager;
- NEC Project Manager;
- NEC Supervisor; and
- Principal Contractor Site Manager.

The CEMD, will be updated during the construction phases to take account of additional detail as it becomes available as well as learning from experience. Each section will be subject to review, and if required, updates will be made at the following points:

- Appointment of Principal Contractor;
- Following results of protected species pre-construction surveys, and
- As required following lessons learned during the construction works.

Updates to the CEMD proposed by the Principal Contractor will be reviewed by and agreed with the ECoW. If deemed appropriate, they will be incorporated, and updates circulated as discussed above.

Any material changes to the content of the CEMD will be discussed and agreed with Marine Scotland, the Highland Council, and relevant Statutory Consultees prior to implementation on site. For the avoidance of doubt, changes made to the CEMD to align it with licences do not need to be agreed with regulators if the mitigation is agreed by through the licencing process.



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| 5.3 | Implementation..... | 5-5 |



5 Auditing

5.1 Introduction

The IECoW will develop audit templates and check lists to facilitate compliance checks with licences, the CEMD, Risk Assessed Method Statements (RAMS), and relevant environmental construction guidance as identified within the Schedule of Mitigation (Section 14). The audits and checks will be carried out by the ECoW and the Principal Contractors Site Manager (PCSM) (or appropriate delegate). The audits and checks will also verify if the mitigation is effective in minimising environmental impacts and risks. The ECoW will carry out audits on behalf of the Staffin Community Trust to ensure that works are compliant with the relevant licences and consents.

5.2 Audit Programme

The frequency of audits and checks by the ECoW and the Contractors PCSM (or appropriate delegate) is provided in Table 5.1. The aspects audited align to the aspects identified for each phase of work as discussed in Section 6. Where two tones are shown in Table 5.1, it indicates that the audit frequency will be reduced with time as the procedures becomes embedded, the reduction in frequency will be determined by the ECoW in discussion with the IECoW based on audit performance results.

Audits associated with pollution and waste regulations will be carried out throughout the construction period irrespective of what tasks are being completed on the site.

Any environmental issues identified during health and safety audits must be reported to the ECoW/IECoW to all appropriate follow-up.



Table 5.1: Audit Frequency

| Aspects | Audit | Responsible Personnel | Tasks | | | | | | | | | |
|--|--|-----------------------|------------------|----------------|---------|----------|--------------|-----------------------|-----------------------|--------|--------|--------|
| | | | Land Reclamation | New Breakwater | Slipway | Pontoons | Hardstanding | Buildings & Utilities | Borrow Pit Operations | | | |
| Air Quality – Dust | Dust Management Plan | ECoW | Green | Blue | Green | Blue | Blue | Grey | Blue | Purple | Blue | |
| | Roads Check - Trackout | PCSM | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | |
| In-Air Noise & Vibration | Noise & Vibrations Monitoring | ECoW | Grey | Grey | Grey | Grey | Grey | Grey | Grey | Green | Blue | |
| Archaeology & Geology | Archaeology Protocol Implemented | ECoW | Green | Blue | Green | Blue | Green | Blue | Grey | Green | Green | |
| | Palaeontology Protocol Implemented | ECoW | Green | Blue | Green | Blue | Green | Blue | Grey | Green | Green | |
| Marine Ecology | Protection Plan Implemented | ECoW | Green | Blue | Green | Blue | Green | Blue | Grey | Grey | Grey | |
| Terrestrial Ecology | Protection Plan Implemented | ECoW | Green | Blue | Green | Blue | Grey | Grey | Green | Purple | Green | Blue |
| Public Access, Construction Traffic & Navigation | Public Access/Core Path Audit | ECoW | Purple | Purple | Purple | Purple | Grey | Grey | Grey | Grey | Purple | Purple |
| | Delivery Audit | ECoW | Blue | Blue | Blue | Blue | Grey | Blue | Grey | Grey | Grey | Grey |
| | Navigational Access | ECoW | Purple | Purple | Purple | Purple | Purple | Grey | Grey | Grey | Grey | Grey |
| Water Quality – Pollution Prevention | Fuel Storage and Refuelling | ECoW | Blue | Blue | Blue | Blue | Blue | Blue | Blue | Blue | Blue | Blue |
| | Concrete Washout/Works | ECoW | Grey | Grey | Blue | Blue | Grey | Blue | Blue | Blue | Blue | Blue |
| | Spill Kits and Emergency Procedures | ECoW | Blue | Purple | Blue | Purple | Blue | Purple | Blue | Purple | Blue | Purple |
| | Sediment Loading Check/Audit | PCSM Check | | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow |
| | | ECoW Audit | | Blue | Purple | Blue | Purple | Grey | Grey | Grey | Grey | Grey |
| | Water Management Plan Check/Audit | PCSM Check | | Grey | Grey | Grey | Grey | Grey | Grey | Grey | Grey | Yellow |
| ECoW Audit | | | Grey | Grey | Grey | Grey | Grey | Grey | Grey | Grey | Blue | Purple |
| Materials & Waste | Material and Waste Storage Check/Audit | PCSM Check | Blue | Blue | Blue | Blue | Blue | Blue | Blue | Blue | Blue | Blue |
| | | ECoW Audit | Blue | Blue | Blue | Blue | Blue | Blue | Blue | Blue | Blue | Blue |
| | Litter Check | PCSM | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow |
| | Waste Transfer Notes Audit | ECoW | Grey | Grey | Grey | Grey | Grey | Grey | Purple | Purple | Purple | Purple |



Audit/Check Frequency Key

| |
|------------------------|
| Not Required |
| Daily |
| Weekly |
| Monthly |
| Where Necessary |



5.3 Implementation

Audit forms including checklists will be utilised for each audit type to ensure that all items are appropriately checked and that audits are recorded in a systematic manner.

Where audits identify areas of improvement, appropriate steps will be taken to implement these. Improvements requiring immediate action will be immediately raised with the Site Manager (SM), to allow for actions to be arranged. If immediate action is not required, then the audit report will be submitted within 24 hours of the audit, to the SM, and actions agreed at the next site management meeting.

Daily checks such as dust, litter and water quality checks when there are no issues arising and do not warrant the completion of daily audit form should be recorded in the site diary to evidence that checks were completed. Note full audits including the daily check items will be required at the frequency identified in Table 5.1.

In addition to identifying areas for improvement, areas of good practice will be highlighted and fed back to allow appropriate recognition to be given, and learning to be shared.

Audits should be stored in an accessible, electronic location to allow the IECoW to review as required.



| Construction Environmental Management Document | | |
|---|--|--|
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| Section Title | Construction Environmental Management Plans | |
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6 Construction Environment Management Plans

6.1 Introduction

The Staffin Community Trust (SCT) take their environmental responsibilities very seriously, and the SCT have worked closely with Affric Limited throughout the consenting phase to ensure environmental impacts have been understood and minimised as far as practicable. The NEC Project Manager and Supervisor will continue to ensure that all environmental mitigation measures required within the design and construction are incorporated. The Principal Contractor will have an ISO14001 (or equivalent) approved Environmental Management System (EMS) and all works associated with the construction of the Staffin Community Harbour development will be conducted under the provisions of this system.

Within this Construction Environmental Management Plan (CEMP), each stage of the development construction is discussed in turn with respect to each relevant aspect. Where appropriate, references to other sections are provided to avoid the duplication of information.

Table 6.1 provides a summary of the aspects associated with each of the construction tasks. Aspects that require specific mitigation and/or monitoring to minimise impacts are shown in red. Those shown in yellow require general mitigation or monitoring, which has been identified within the other sections of the CEMD. It should be noted that all staff have environmental and health and safety responsibilities and will undergo site induction training and task specific environmental training as detailed in Section 3.

Risk Assessed Method Statements (RAMs) will be in place for specific activities to ensure that appropriate environmental protection measures are in place throughout.

Table 6.1: Aspects Associated with Each Task

| Aspects | Task | | | | | | | |
|--------------------------------------|------------------|----------------|---------|----------|--------------|-----------------------|-----------------------|--|
| | Land Reclamation | New Breakwater | Slipway | Pontoons | Hardstanding | Buildings & Utilities | Borrow Pit Operations | |
| Air Quality – Dust | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Red | |
| In-Air Noise & Vibrations | Grey | Grey | Grey | Grey | Grey | Grey | Red | |
| Archaeology, Geology & Palaeontology | Red | Red | Red | Grey | Grey | Red | Red | |
| Marine Ecology | Red | Red | Red | Red | Grey | Grey | Grey | |
| Terrestrial Ecology | Yellow | Yellow | Grey | Grey | Grey | Red | Yellow | |



| | | | | | | | |
|--------------------------------------|--------|--------|--------|--------|--------|--------|--------|
| Public Access & Construction Traffic | Red | Red | Yellow | Grey | Yellow | Grey | Red |
| Navigation | Yellow | Red | Red | Red | Grey | Grey | Grey |
| Water Quality – Pollution Prevention | Red | Red | Red | Yellow | Yellow | Red | Red |
| Materials & Waste | Yellow |

| |
|---|
| Key |
| Specific and General Requirements Apply |
| General Requirements |
| Not applicable |

6.2 General Requirements

As detailed in Table 6.1, some aspects require topic specific mitigation, whilst others require general mitigation measures associated with the construction activities. The general requirements which apply to various construction activities of the Staffin Community Harbour development and at the winning of material at the Lealt Borrow Pit are detailed in Sections 6.2.1 – 6.2.5.

Sections 6.3 – 6.8 detail the specific requirements outlined for each construction activity. Where construction activities only have general requirements associated with each aspect, these are not detailed within Sections 6.3 – 6.8 to avoid duplication throughout the document.

6.2.1 Air Quality – Dust

The construction of the new breakwater, slipway, hardstanding, buildings & utilities, as well as land reclamation activities and the installation of pontoons, all have the potential to be sources of dust, and require generalised mitigation practices. With the emphasis on the use of best practice to maintain acceptable site dust levels, the most appropriate mitigation must be considered within overall site management practices. A Site Dust Management Plan has therefore been developed that adopts the principles of:

- Prevention, in other words, preventing dust from becoming airborne; and
- Containment and/or recapture of dust once it is in the air.

Construction site dust associated with the aforementioned activities, as detailed in Table 6.1, will be managed in line with Section 10: Dust Management Plan.

Specific mitigation associated with borrow pit operations are outlined in 6.8.



6.2.2 Terrestrial Ecology

General requirements for disturbance to terrestrial ecology specifically otter and breeding birds, associated with land reclamation works, construction of the new breakwater and borrow pit operations are required.

The protection measures required for otter and breeding birds are included in 13.4 & 13.5 of Section 13: Habitat and Species Protection Plans.

Mitigation associated with the introduction of Invasive Non-Native Species (INNS) are outlined in 13.6 of Section 13: Habitat and Species Protection Plans.

6.2.3 Public Access, Construction Traffic and Navigational Management

No development shall commence on site until upgrades to the public road from the A855 to the application site have been completed, to appropriately manage and mitigate the traffic associated with the development.

General requirements for the management of construction traffic are outlined in 12.3.3.1 of Section 12: Public Access, Construction Traffic & Navigational Management Plan. These are required for the construction of hardstanding and during improvements being to the slipway.

The Principal Contractor Site Manager will be the point of contact for any complaints or issues arising. They will carry out appropriate investigations in the event of any complaints or issues being identified, to understand the route cause and resolution where practicable.

Specific requirements for land reclamation, the breakwater and borrow pit operations are discussed in Sections 6.3, 6.4 and 6.8 respectively.

6.2.4 Water Quality – Pollution Prevention

Overall, the majority of activities will require materials and wastes to be stored that could give rise to pollution, hence Section 7: Site Waste, Materials and Plant Management Plan and Section 9: Water Quality, should be complied with throughout the construction works. If an incident does occur, the Pollution Prevention Plan and Oil Spill Contingency Plan as detailed in Appendix 9B and 9C, respectively, should be followed.

Additional specific mitigation required during the construction of the land reclamation, new breakwater, slipway, buildings and utilities, and borrow pit operations are discussed in Sections 6.3, 6.4, 6.5, 6.7 and 6.8 respectively.

6.2.5 Materials & Waste

Materials should be managed as detailed in Section 7 and the waste hierarchy employed throughout the works.

Throughout all stages of the works good housekeeping should be employed to minimise dust and littering. Measures should be in place to ensure items are not windblown where they may end up in the marine environment. When equipment and materials are no longer required, they should be removed from the construction site.



6.3 Land Reclamation

6.3.1 Archaeology, Palaeontology and Geology

During construction, direct physical impacts are likely to occur from earthmoving operations and construction of all infrastructure associated with the construction of the proposed harbour development. The current development proposal includes the removal of the boat nausts within the proposed harbour development and will therefore be directly impacted. A programme of Historic Building Recording will be undertaken on the boat nausts within the proposed harbour development prior to their dismantling. A watching brief will be undertaken during their dismantling and groundworks in their immediate vicinity, to assess the potential for hitherto unrecorded buried archaeological remains (see 8.2.1 of Section 8: Protocol for Archaeological & Geological Discoveries and Appendix 8B: Paleontological Discoveries). The aim of the Watching Brief is to identify any archaeological remains threatened by the proposed harbour development, to assess their significance and to mitigate any impact upon them either through avoidance or, if preservation in situ is not warranted, through preservation by record.

The land reclamation works have the potential to affect palaeontological features at An Corran beach, should exposed infill material be mobilised by storm events. To prevent infill material from being exposed to the prevailing wave climate, the initial layers of rock armour will be placed on the outer edge of the land reclamation first. The armour will be formed into a triangular shape with the peak at a level above Mean High Water Springs (MHWS). The rock armour bund can then be infilled with smaller infill material which will be protected by the armouring. As the infill material reaches MHWS heights rock armouring will promptly be placed on the outer edges, thereby ensuring that infill material is always contained.

6.3.2 Marine Ecology

Land reclamation works could give rise to disturbance and/or physical injury to marine mammals, in particular, seals, if they are close to construction activities or hauled out on the foreshore. To minimise the risk of direct physical injury to all marine mammals, particularly seal species, construction staff will be briefed to look for seals in the vicinity of the works, as described in the Marine Mammal Protection Plan (see Section 13).

6.3.3 Public Access, Construction Traffic & Navigational Management Plan

Public access to the existing harbour, and foreshore areas should be maintained at all times. Mitigation to minimise the effects of access restrictions to local amenities is outlined in Section 12.3 of Section 12: Public Access, Construction Traffic & Navigational Management Plan

All deliveries of material to be used in land reclamation should be carried out in accordance with the mitigation outlined in Section 12.3.3 of Section 12: Public Access, Construction Traffic & Navigational Management Plan.

6.3.4 Water Quality – Pollution Prevention

Land reclamation works have the potential to give rise to increased solids in the water column, which may be observed as sediment plumes from the surface. Land Reclamation works will be required to minimise sedimentation in the water column through minimising heights in which



materials are dropped from and ensuring careful placement. Mitigation associated with sedimentation is outlined in 9.3.4 of Section 9: Water Quality.

6.4 New Breakwater – Further Approval Required Before These Works Commence

6.4.1 Archaeology, Palaeontology and Geology

During construction, direct physical impacts on undiscovered archaeological features/artefacts could occur from earthmoving operations and construction of all infrastructure associated with the construction of the proposed harbour development. A watching brief will be undertaken during dismantling and groundworks in the immediate vicinity of the construction of the new breakwater, to assess the potential for hitherto unrecorded buried archaeological remains. The aim of the Watching Brief would be to identify any archaeological remains threatened by the proposed harbour development, to assess their significance and to mitigate any impact upon them either through avoidance or, if preservation in situ is not warranted, through preservation by record.

The construction of the new breakwater has the potential to affect palaeontological features at An Corran beach, should exposed infill material be mobilised by storm events. To prevent infill material from being exposed to the prevailing wave climate for long periods of time, phasing of material placement will be required. Phasing will include secondary armour being placed over the sections of placed infill material, before continuing to construct the breakwater outwards. By phasing the placement of material in this manner, it can be ensured that the infill material placed is protected from exposure to the wave environment promptly.

In addition, frequent weather forecast checks will be made so that potential storm events can be identified. In the event that a storm is forecast additional steps will be taken to ensure that infill material is not exposed to the wave climate. This is likely to take the form of temporary rock armour placement, strategically placed to protect infill material to prevent loss of material.

6.4.2 Marine Ecology

Land reclamation works could give rise to disturbance and/or physical injury to marine mammals, in particular, seals, if they are close to construction activities or hauled out on the foreshore. To minimise the risk of direct physical injury to all marine mammals, particularly seal species, construction staff will be briefed to look for seals in the vicinity of the works, as described in the Marine Mammal Protection Plan (see Section 13).

6.4.3 Public Access, Construction Traffic & Navigational Management Plan

Public access to the existing harbour, and foreshore areas should be maintained at all times. Mitigation to minimise the effects of access restrictions to local amenities is outlined in Section 12.3 of Section 12: Public Access, Construction Traffic & Navigational Management Plan.

All deliveries of material to be used in land reclamation should be carried out in accordance with the mitigation outlined in Section 12.3.3 of Section 12: Public Access, Construction Traffic & Navigational Management Plan.



6.4.4 Navigation

During the construction of the new breakwater, access to the existing slipway will be ensured by agreeing and communicating a 'Schedule of Access' via a Local Liaison Access Officer. The use of a Local Liaison Access Officer is also required to ensure that an appropriate notice to mariners is provided prior to and during the construction of the new breakwater. In addition, temporary safe water markers are required to be installed around the works. Full details are listed in Section 12: Public Access, Construction Traffic & Navigational Management Plan.

6.4.5 Water Quality – Pollution Prevention

The construction of the new breakwater has the potential to give rise to increased solids in the water column, which may be observed as sediment plumes from the surface. The construction of the new breakwater will be required to minimise sedimentation in the water column through minimising heights in which materials are dropped from and ensuring careful placement. Mitigation associated with sedimentation is outlined in 9.3.4 of Section 9: Water Quality.

6.5 Slipway

6.5.1 Marine Ecology

Land reclamation works could give rise to disturbance and/or physical injury to marine mammals, in particular, seals, if they are close to construction activities. To minimise the risk of direct physical injury to all marine mammals, particularly seal species, construction staff will be briefed to look for seals in the vicinity of the works, as described in the Marine Mammal Protection Plan (see Section 13).

6.5.2 Navigation

During the construction of the new slipway, the existing slipway will be available for use. If practicable, the new slipway will be made available for use prior to concrete works on the existing slipway, so that there is always a slipway available for use.

During the construction of the new slipway, access to the slipway will be ensured by agreeing and communicating a 'Schedule of Access' via a Local Liaison Access Officer. The use of a Local Liaison Access Officer is also required to ensure that an appropriate notice to mariners is provided prior to and during the construction of the new slipway. In addition, temporary safe water markers are required to be installed around the works. Full details are listed in Section 12: Public Access, Construction Traffic & Navigational Management Plan.

6.5.3 Water Quality – Pollution Prevention

Slipway works, which involve concrete pours, will require the installation of appropriate shuttering prior to concrete pours taking place and where appropriate, sealed with silicon or an equivalent to ensure concrete which has been poured does not leach out and escape into the marine environment. In addition, any concrete pours into water will utilise marine compatible materials.

Concrete washings will be managed as per the methods outlined in 7.4 of Section 7: Site Waste, Materials and Plant Management Plan.



6.6 Pontoons

6.6.1 Marine Ecology

The installation of pontoons could give rise to disturbance and/or physical injury to marine mammals, in particular, seals, if they are close to the construction activity. To minimise the risk of direct physical injury to all marine mammals, particularly seal species, construction staff will be briefed to look for seals in the vicinity of the works, as described in the Marine Mammal Protection Plan (see Section 13).

6.6.2 Navigation

During the installation of pontoons, access to the slipway will be ensured by agreeing and communicating a 'Schedule of Access' via a Local Liaison Access Officer. Full details are listed in Section 12: Public Access, Construction Traffic & Navigational Management Plan.

6.7 Buildings & Utilities

6.7.1 Archaeology, Palaeontology and Geology

Specific mitigation associated with Archaeology, Palaeontology and Geology is outlined in Section 8: Protocol for Archaeological & Geological/Paleontological Discoveries.

6.7.2 Terrestrial Ecology

To facilitate the laying of the water pipe, the vegetation will be turved and appropriately stored adjacent to the pipe route. The turves will be reinstated as quickly as possible, to maximise the potential success of reinstatement. A similar approach will be utilised in other areas where vegetation requires temporary removal.

Care will also be taken to minimise disturbance of vegetation in the vicinity of the works as detailed in Section 13.3.

Impacts on otters and breeding birds will be managed in accordance with the protection plan outlined in Sections 13.4 and 13.5 of Section 13: Habitats and Species Protection.

6.7.3 Water Quality – Pollution Prevention

The construction of buildings, and activities undertaken for the installation of utilities which involve concrete pours, will require the installation of appropriate shuttering prior to concrete pours taking place. Where appropriate, areas should be sealed with silicon or an equivalent to ensure concrete which has been poured does not leach out and escape into the marine environment.

Concrete washings will be managed as per the methods outlined in 7.4 of Section 7: Site Waste, Materials and Plant Management Plan.



6.8 Borrow Pit Operations

6.8.1 Air Quality – Dust

All materials at the Lealt Borrow Pit which require to be blasted, crushed and stored should be done so in accordance with Section 10: Dust Management Plan. Quarrying works at the Lealt Borrow Pit should also be carried out in accordance with the Blasting Method Statement (Appendix 11A) which will be produced by the blasting contractor.

6.8.2 In-Air Noise

Blasting at the Lealt Borrow Pit will give rise to in-air noise impacts. Blasting should be carried out in accordance with the Blasting Method Statement (Appendix 11A) produced by the blasting contractor, which takes into account the mitigation outlined in Section 11: Noise and Vibration.

No blasting operations shall take place out with the hours of 10.00am to 5.00pm Monday to Friday and not at all on Saturdays, Sundays, or a Bank Holiday in Scotland, as prescribed in Schedule 1 of the Banking and Financial Dealings Act 1971 (as amended).

Ground vibrations as a result of the blasting operations shall not exceed a peak particle velocity of 6mms^{-1} in 95% of all blasts within any 6-month period. No individual blast shall exceed a peak particle velocity of 12mms^{-1} as measured at noise sensitive properties. The measurement shall be the maximum of three mutually perpendicular directions taken at ground surface at any vibration sensitive building.

In addition, operations, including vehicle movements, associated with the Lealt Borrow Pit works, for which noise is audible at the curtilage of any noise sensitive property, shall only be permitted between

- 08:00 hours and 19:00 hours Monday to Friday; and
- 08:00 hours and 13:00 hours on Saturdays.

Outwith these hours there shall be no activities for which noise is audible at the curtilage of any noise sensitive property, this includes activities for crushing and screening quarried aggregates.

6.8.3 Archaeology, Palaeontology and Geology

Specific mitigation associated with Archaeology, Palaeontology and Geology is outlined in Section 8: Protocol for Archaeological & Geological/Paleontological Discoveries.

6.8.4 Public Access & Construction Traffic

Measures will be taken to ensure public access to the recreational areas surrounding the Lealt Quarry during all blasting and quarrying activities. The appropriate management procedures implemented are likely to include:

- Temporary clearance of the paths near the Lealt Borrow Pit, posting of sentries.
- Provision of appropriate notice to the community of when and where works will be taking place prior to and as required during the construction works; and



- Signage of any detours or alternative provisions will be displayed.

Specific management procedures associated with public access will be required to be produced by the blasting contractor following the appointment of the principal contractor.

In addition, A Public Scheme is outlined in Section 12: Public Access and Construction Traffic Management Plan.

6.8.5 Water Quality – Pollution Prevention

Measures taken to prevent impacts on water quality and to prevent pollution events during quarrying and blasting activities at the Lealt Borrow Pit are outlined in Appendix 9A.



| Construction Environmental Management Document | |
|---|--|
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| Issue Date | 12/12/2023 |
| Author | Rhona Taylor and Daisy Hodge |
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7 Site Waste, Materials and Plant Management Plan

7.1 Introduction

Due to the scale of the development and the volume of materials used in construction, the storage of construction materials needs to be carefully considered and appropriately managed. This also includes the use and storage of fuels and hazardous substances, although these have been considered in Section 9: Water Quality of the CEMD. In addition, plant will be required to be appropriately managed to limit landscape and visual impacts.

Waste arising during construction through material use will include concrete washings, off-cuts of rebar metals and packaging materials associated with both constructions works and the welfare facilities. The waste hierarchy will be employed throughout the construction works to manage site waste.

7.2 Material Requirements

The estimated quantities of the main materials associated with the construction of the Staffin Community Harbour development below Mean High Water Springs (MHWS) are provided below:

- 150 tonnes of steel/iron;
- 15 tonnes of timber;
- 900 tonnes of concrete;
- 30 tonnes of plastic/synthetic materials for pontoons, fendering and decking;
- 520m³/1,000 tonnes of sand (0.063mm < 2.00mm) for rockfill fraction;
- 1,130m³/2,200 tonnes of gravel (2.00mm < 64.0mm) for rockfill fraction;
- 21,000m³/40,000 tonnes of cobbles (64.0mm < 256.0mm) for rockfill fill;
- 22,900m³/40,000 tonnes of boulders (> 256.0mm) for rockfill armour;
- 150m³ of tarmac for surfacing; and
- 10 tonnes of rubber for pontoon fendering.

In addition, there will be materials used above MHWS associated with the construction of buildings and provision of utilities.

7.2.1 Material Storage

To prevent excessive stockpiling of materials, material orders and deliveries will be carefully considered and appropriately managed.

7.2.2 Fuels, Oily Substances and Hazardous Materials

The storage of Fuels, Oils and Hazardous Materials is covered in 9.3.2 and 9.3.3 in Section 9: Water Quality.



7.3 Waste Hierarchy Implementation

7.3.1 Reducing Waste

Where practicable, steps will be taken to avoid the production of waste. For example, the use of reusable water bottles, crockery and cutlery in the welfare facilities will prevent the need for single use plastics.

Where practical, requests should be made to suppliers to minimise packaging.

Similarly, ordering the correct quantity and types of materials will prevent unused excess materials being disposed of as waste.

7.3.2 Reuse

Where possible, materials can be reutilised. For example, wood utilised in shuttering can be utilised more than once. Concrete wash water can be reutilised to wash equipment once it has been settled out.

7.3.3 Recycle

Recycling will be facilitated by the segregation of wastes. Clearly marked and labelled waste receptacles will be provided in designated areas. Wastes suitable for recycling are likely to include wood, metals, glass, paper, plastics and oils.

7.3.4 Dispose

Solid waste not suitable for recycling will be sent to landfill as waste, or special waste, depending on its constitution. A suitable licensed waste contractor will be employed to collect wastes for recycling and disposal.

7.4 Concrete Washing

Concrete washings will be carried out in a dedicated area. Washing arisings will be collected for onsite treatment. This will include settlement and, if required, pH corrected utilising carbon dioxide preferably. The liquids will be reused on site as grey water if suitable or taken off site for appropriate disposal. The solids will be reused as aggregate or disposed of as solid waste.

7.5 Litter

Prior to construction works, litter sweeps will be conducted to prevent the escape of existing litter on site into the marine environment and onto new areas of the construction site.

All personnel working on the project will undertake site induction and a toolbox talk specific to litter. This will include information on waste management and the use of the waste receptacles provided including designated smoking area and cigarette disposal facilities. It will be made clear that littering will not be tolerated. Construction staff will be encouraged to collect any litter they see in the construction areas and, if deemed necessary, litter sweeps will be carried out.



7.6 Waste Management

Waste receptacles (bins and skips) will incorporate lids or covers to protect against vermin gaining access and wind blowing wastes out of skips, giving rise to litter.

The Principal Contractor will put in place procedures for ensuring that appropriate records are kept for all waste arisings including volumes, categories and waste carriers used, and that waste transfer notes are retained.

7.7 Plant Management

Material/equipment/containers within the harbour area shall not be stored to a height greater than three metres above the existing ground level of the site at any time, to ensure the visual amenities of the Trotternish National Scenic Area are not compromised.

7.8 Transport

Materials delivered by road will be appropriately contained for transport, and dust covers utilised for loads likely to generate dust. As detailed in Section 12: Public Access, Construction Traffic & Navigational Management Plan, the majority of aggregate for infill will be won locally from the Lealt Quarry to minimise HGV miles. Other material will also be locally sourced wherever possible and economically viable to minimise greenhouse gas emissions associated with transfer.

7.9 Monitoring

The Principal Contractors Site Manager or delegate will carry out regular checks for litter and to ensure that material and wastes are being appropriately stored.

The ECoW will carry out regular waste compliance audits in line with Section 5 and review details of waste arisings to identify areas for opportunity to reduce or recycle more wastes in conjunction with the Principal Contractors Site Manager.



| Construction Environmental Management Document | |
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8 Archaeological & Geological/Paleontological Assets

8.1 Introduction

Three known archaeological heritage assets were identified within the development boundary of the Staffin Community Harbour (SCH): the existing slipway, boat nausts and a drystone culvert. The Borrow Pit exhibits degraded wall remains, a turf bank and displaced concrete block. Only the boat nausts will be directly impacted by the development and are deemed to be of local importance, and a relatively common heritage asset within Scotland. Flint scatters, shell middens, prehistoric remains and other archaeological assets are found within 1km of the SCH development site, though outwith the development area itself.

Records of palaeontology have been identified close to the development area, namely an area of dinosaur footprints, along the An Corran beach, resulting in the designation of a Geological Conservation Review (GCR) site. Protocols for the discovery of both archaeological (Appendix 8A) and geological/paleontological (Appendix 8B) records are therefore outlined for the construction phase of the Staffin Community Harbour development and for works at the Lealt Borrow Pit.

8.2 Mitigation

8.2.1 Written Scheme of Investigation

The Written Scheme of Investigation (WSI) produced for the works ensures that an archaeologist will conduct an archaeological watching brief and outlines the watching brief methodology that is required to be undertaken. The WSI is outlined in Appendix 8C.

8.2.2 Onshore WSI

The WSI details how the requirements of the project will be met. All work will be conducted in accordance with the Highland Council Standards for Archaeological Work (2012) and the Chartered Institute for Archaeologists' (CIfA) Code of Conduct (2019).

The aim of the watching brief is to identify any archaeological remains threatened by the proposed Staffin Community Harbour development, to assess their significance and to mitigate any impact upon them either through avoidance or, if preservation in situ is not warranted, through preservation by record. If, significant archaeological remains are identified during the Watching Brief there is the potential that further works, such as excavation and post-excavation analyses, could be required.

The watching brief will be undertaken by at least one archaeologist, subject to the number of site operations being carried out at any one time. All mechanical excavation will be conducted with a suitable bucket for the purposes of an archaeological watching brief and constantly monitored by the watching archaeologist.

Where small discoveries (those requiring less than two hours to deal with) are encountered, these will be excavated and recorded in accordance with archaeologist's standard practice.



Where larger discoveries are made (those requiring more two hours to deal with) the archaeologist will immediately inform the client to describe the features and propose, if appropriate, a mitigation strategy for their excavation. If the Highland Council archaeologist agrees to these works, then a supplementary method statement will be prepared, and the arrangements confirmed by email. All excavation works will be undertaken in accordance with archaeologist's standard procedures.

Should human remains be uncovered these will be treated in accordance with Scots Law, standard archaeologist's policy, ClfA standard practice and in keeping with Historic Scotland's The Treatment of Human Remains in Archaeology guidance. Any human remains which are encountered will initially be left in situ. Their removal will be a matter of discussion with the client and The Highland Council (who must be notified within 12 hours of their discovery). The police will also be informed prior to the removal of any bone material.

In the event of extensive and significant archaeological findings being encountered, the archaeologist would request an on-site meeting with the client and the Highland Council archaeologist to discuss an appropriate mitigation strategy for further work. The programme, and additional resources, for any contingent excavation will be agreed with the client. Accordingly, this WSI will need revising before any further fieldwork proceeds.

8.2.3 Offshore PAD

If artefacts are present in the development area, the activities associated with marine construction could impact the marine historic environment, particularly, marine archaeological finds brought to the surface during construction works. This procedure is based on the relevant sections of the Protocol for Archaeological Discoveries (PAD) as established by Wessex Archaeology on behalf of The Crown Estate, for marine finds and historic environments advice for offshore finds. An overview of the PAD is outlined in Figure 8.1.

Prior to works commencing, the archaeologist will brief the dredge team on the significance of archaeological finds and will instruct the construction team to report any discoveries to the Site Manager and ECoW. In the event of a find, any works which may cause further disturbance to the area will be ceased.

8.2.3.1 Initial Steps

The initial steps to be taken will be determined by the find location:

- In-situ – finds spotted while still in location ground or seabed; or
- Out of Situ – finds removed from the seabed prior to discovery.

8.2.3.2 In-situ Finds

If the find is still in-situ it should not be disturbed until appropriate advice is sought from the ECoW or Site Manager in the first instance and the location should be noted and managed appropriately to prevent further disturbance.



8.2.3.3 Out of Situ Finds

If the find has already been taken out of situ (dislodged, removed) and is not expected to be a human remain, it will be documented, photographed and preserved by the ECoW (or an appropriate delegate) as per instructions in Wessex and Crown Estate PAD Handouts (Appendix 8A). Note no dredging is planned, however the existing breakwater is to be removed.

8.2.3.4 Find Management

The find type will determine the next steps to be taken. Find types have been split into three:

- Structural Components, Large Objects, or Potential Archaeological Site: for example, a structural component, large object, or multiple small objects potential indicating an archaeological site;
- Objects: smaller objects such as coins, arrow heads, jugs, items which on their own may not indicate the presence of an archaeological site; and
- Human Remains.

Steps to be taken in each situation are detailed below:

Structural, Large Object or Potential Archaeological Site

Where part of a structure or a large object have been uncovered, then this should be photographed, and advice sought from an archaeological consultant in the first instance to confirm it is an archaeological find. It should then be reported to Marine Directorate, and an agreement made on how to proceed.

Objects

If an individual object or artefact is found in situ, it should be photographed in-situ, if it can be easily excavated without damaging it (for example a coin) then it can be removed by the ECoW (or a diver under the ECoW's instruction), documented, photographed and preserved by the ECoW as per appropriate instructions in the Wessex and Crown Estate PAD Handouts (Appendix 8A).

If it cannot be easily removed without damaging the object, then advice should be sought from the consultant archaeologist regarding appropriate excavation techniques. If there are multiple (three or more) objects found, then the protocol for potential archaeological site should be followed.

Human Remains

In the highly unlikely event of finding potential human remains, works in the vicinity of the find will be stopped, the remains will not be touched or disturbed, and the police will be informed. All staff will be briefed that the matter should be kept confidential until official announcements have been made and the dignity of the deceased will be ensured at all times.



If the remains are already out of situ, works should be stopped in the location they were found. The handling of the remains should be minimised, but they should be made safe from damage while awaiting police attendance.

8.2.3.5 Prior to Restarting Works

Advice will be sought from an archaeological consultant and if necessary Marine Directorate and the Highland Council (for intertidal finds), with regard to any additional requirements associated with continuing works in the area of a find.

8.2.3.6 Reporting

Reports will be made to Marine Directorate and the Highland Council (for intertidal finds) with regard to all finds made, and the article preserved safely until it is determined where it should reside. In event of an archaeological discovery archive reports and/or data from any archaeological discoveries should be provided to the relevant archives, including Historic Environment Scotland (HES), The Highland Council for their Historic Environmental Record, Online Access to the Index of Archaeological Investigations (OASIS) and the Marine Environment Data and Information Network (MEDIN) once the works have been completed.

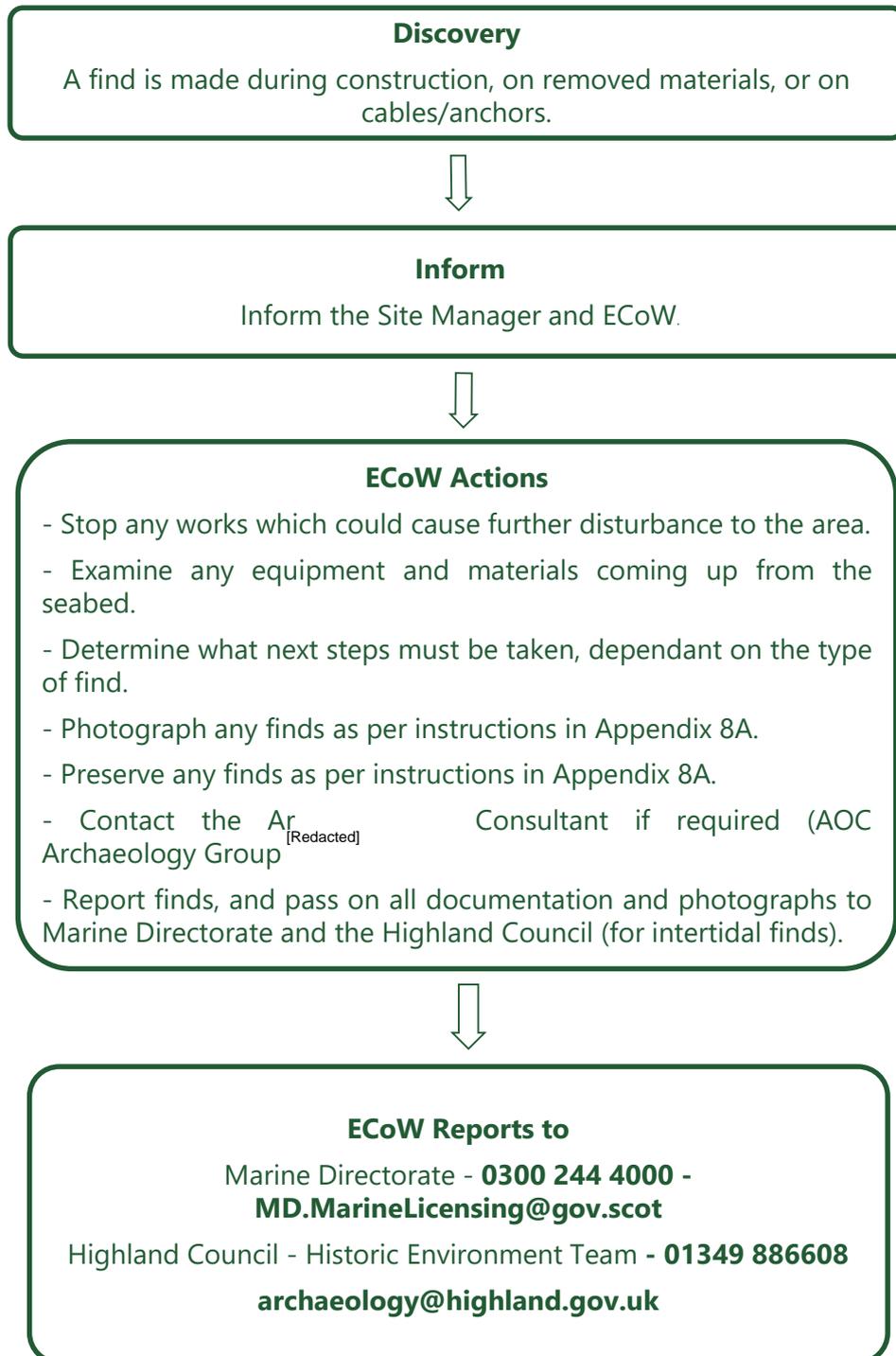


Figure 8.1: Protocol for Archaeological Discoveries



8.2.4 Geological/Palaeontological Discoveries

Known fossils/paleontological assets that are present in the area will be included in the risk assessment for work being undertaken on site. Additionally, the area of dinosaur footprints on An Corran beach does not fall within the development boundaries and no construction activities will take place which will impact them.

Detailed visual inspections at both the Harbour Development and Borrow Pit will be conducted by a local palaeontological expert prior to works commencing, and during key activities of works which may have the potential to expose fossils, should they be present. Site inspections will be recorded via a written summary.

Appropriate training will be provided to site employees (such as site supervisor and operatives) that includes awareness of fossil resources, and information on the Scottish Fossil Code. This will be delivered by a suitably experienced geologist/palaeontologist and rolled out via a series of toolbox talks.

A Scottish Fossil Code Poster will be placed on the environment, health and safety boards in the welfare facilities make all construction workers aware of the fossil resources. If an unexpected change in geology or a suspected fossil discovery is identified at any point of works in the Borrow Pit or at the Harbour Development, works will stop until a detailed inspection has occurred. Should any fossils be found, the Scottish Fossil Code (Appendix 8D) will be followed.

The complete protocol for geological/palaeontological discoveries is outlined in Appendix 8B.

8.2.5 Construction Mitigation

The construction of the land reclamation and new breakwater have the potential to affect palaeontological features at An Corran beach, should exposed infill material be mobilised by storm events. To prevent infill material from being exposed to the prevailing wave climate for long periods of time, phasing of material placement will be required. Phasing will include secondary armour being placed over the sections of placed infill material, before continuing to construct the breakwater outwards.

The phased placement of material in this manner can ensure that the deposited infill material is protected from exposure to the wave environment promptly, hence safeguarding the palaeontological features at An Corran beach.

In addition, frequent weather forecast checks will be made so that potential storm events can be identified. In the event that a storm is forecast additional steps will be taken to ensure that infill material is not exposed to the wave climate. This is likely to take the form of temporary rock armour placement, strategically placed to protect infill material to prevent loss of material and minimise the risk of any potential damage to the An Corran palaeontological features.



Appendix 8A – Protocol for Archaeological Discoveries

Offshore Renewables Protocol

for Archaeological Discoveries



Handout 1: Introduction

Protocol for Reporting Archaeological Discoveries Implementation Service and Awareness Programme

The Crown Estate owns around half the foreshore and nearly the entire seabed out to the 12 nautical mile limit, and has the rights to licence areas up to 200 nautical miles offshore for renewable energy. It is anticipated that by 2020 approximately one-third of all UK energy will be produced from offshore renewables.

Following the success of the British Marine Aggregate Producers Association (BMAPA) Protocol for Reporting Finds of Archaeological Interest, The Crown Estate commissioned Wessex Archaeology to establish and implement a protocol for the offshore renewables industry.

The aim of the Protocol for Archaeological Discoveries (PAD) is to provide a system for reporting and investigating archaeological finds encountered during construction and installation work. Activities associated with renewable energy such as: placement of turbines, cable-laying, geophysical surveys and seabed sampling all have the potential to impact on the historic environment.

Process

Under the Protocol, staff who make a discovery report it to a local 'Site Champion' onboard the vessel or on site. The Site Champion then passes this report to the company's 'Nominated Contact', the person identified to deal with PAD within each developer.

Once a find is reported through the secure web-based reporting system, Wessex Archaeology's 'Implementation Service' is automatically alerted to the presence of a new find. Staff investigate every find with the help of specialists from around the country and compile detailed reports. The reports are then sent to the finder and all relevant authorities.

Awareness

To support the Protocol, Wessex Archaeology is conducting an Awareness Programme which includes visits to sites and companies as well as regular newsletters. This programme aims to raise awareness of, and confidence in, the use of the Protocol amongst staff.

This pack contains advice and guidance in support of the Protocol Implementation Service.

It includes:

- Handout 1 – Introduction
- Handout 2 – What are 'finds'?
- Handout 3 – Reporting
- Handout 4 – Photographing finds
- Handout 5 – Conservation & Storage
- Handout 6 – Prehistoric Finds
- Handout 7 – Metalwork & Concretions
- Handout 8 – Munitions & Ordnance

If any of these are missing, or you would like further copies, please contact the Protocol Team at Wessex Archaeology.

For further information please contact:
Toby Gane (Project Manager)

Wessex Archaeology
Portway House
Old Sarum Park
Salisbury, SP4 6EB
Tel: 01722 326867
Fax: 01722 337562
info@wessexarch.co.uk



Or visit Wessex Archaeology's Protocol pages on the website:
<http://www.wessexarch.co.uk/projects/marine/tcerenewables>

Nominated Contacts should report discoveries through the secure reporting website:
<http://net.wessexarch.co.uk/orpad>

Offshore Renewables Protocol

for Archaeological Discoveries



Handout 2: What are finds?

What are finds? Why should they be reported?

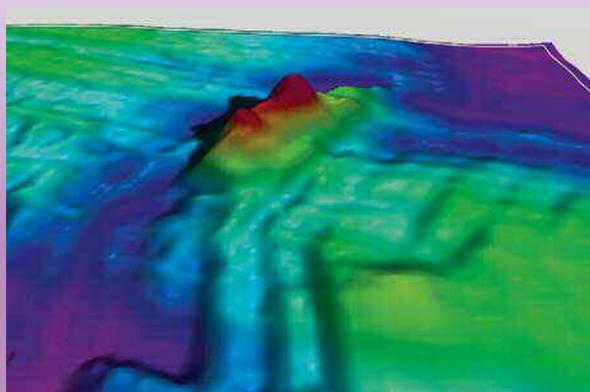
Finds

A 'find' is an object with archaeological potential; this means that it has been impacted by people and may be able to tell us about their past lives. A find can include objects on the seafloor as well as those brought to the surface. We include eco-artefacts as finds; these are remains of animals and plants, such as mammoth and peat, which help us to understand the past human landscape.



Anomalies

Anomalies are a little different from finds in that they are not automatically recognised as archaeological. Instead, anomalies are visual or digital differences that need to be further investigated. Anomalies should always be considered as possibly important archaeological sites until it has been determined otherwise.



Multibeam image of an anomaly

Importance

Archaeological finds are important because they can shed light on past human use of the landscape, sea and seabed. The information that discoveries provide can help archaeologists to understand the human past and protect it for future generations.



Example

The discovery of 28 handaxes with other flint implements and mammoth teeth from the seabed was described as the 'single most important find of Ice Age material from below the North Sea'. The handaxes are between 200,000-300,000 years old and their discovery is incredibly important as they indicate areas where prehistoric humans lived and worked. This example proved that evidence from the last Ice Age has survived underwater and can be found intact.



Selection of handaxes, mammoth teeth and tusk

Offshore Renewables Protocol

for Archaeological Discoveries



Handout 3: The reporting process

The reporting process

On land

Discoveries found in the intertidal zone

A find is made during construction

Discoveries found after work on site

A find or anomaly is discovered during sample analysis or while reviewing geophysical data

At sea

Discoveries made on board a vessel

A find is made on board the vessel, in grabs or attached to anchors and cables

Discoveries found on the seabed

An anomaly indicates that an object or structure has been encountered on the seabed

Project Staff
Inform Site Champion

Site Champion

Avoid further disturbance work in this area (if found during works)

Note the occurrence, in a daybook, or site log

Photograph any find(s) recovered (see Handout 4)

Arrange for any recovered find to be immersed in seawater (if waterlogged) or in a suitable, clean, covered container as appropriate (see Handout 5)

Inform the Nominated Contact and pass on all available information, including a copy of the Preliminary Record and copies of any photographs, drawings or data files

Site Champion

Cease work that may impact the seabed in that area, or move to a new location

Examine any gear, such as grapnels or ploughs, coming up from the seafloor

Note the occurrence in the vessel's log

Mark the area on navigational/survey software

Photograph any find(s) recovered (see Handout 4)

Arrange for any recovered find to be immersed in seawater (if waterlogged) or in a suitable, clean, covered container as appropriate (see Handout 5)

Inform the Nominated Contact and pass on all available information, including a copy of the Preliminary Record and copies of any photographs, drawings or data files

Report to Nominated Contact

Offshore Renewables Protocol

for Archaeological Discoveries



Handout 4: Photographing finds

Photographing finds

What is the photograph for?

The photographs that we receive of new discoveries are very important. They provide a lot of information about each object and can be sent to specialists around the country.

Tips

Make sure there is a scale in the photo – if you do not have the scale sheet provided you can use a ruler or known object, such as a coin or biro, to help show the size of the find.



To avoid light spots in the photo make sure any excess water is wiped off.

Make sure the photo is sharp.

Do not include too many objects in one shot.

Take photographs at different angles; the more photographs and views, the easier it is to interpret the artefact.

Take additional close-up pictures of markings or features that you think are unusual.



Checklist

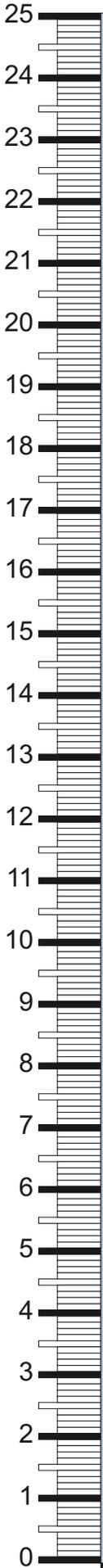
Can someone tell from the photos:

- What size the object is.
- What shape it is.
- What type of object it is.
- What it is made of.
- Whether it has any unusual markings.



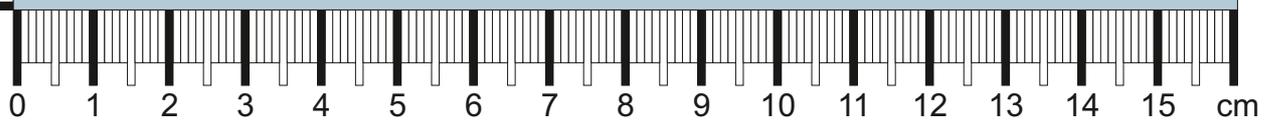
Take photos from different angles

cm



Implementation Service Protocol

Scale correct if printed 100% at A4



Offshore Renewables Protocol

for Archaeological Discoveries



Handout 5: Conservation and Storage

Conservation and Storage

Marine finds are very fragile and can dry out quickly. Don't be fooled; even seemingly robust objects such as cannonballs can quickly degrade if they are not treated correctly.

What do I do with a wet find?

1 – Place the find into a plastic container and completely cover with seawater. If the find is large, cover as much as possible with seawater and wrap the rest in wet fabric or polythene.

2 – Label the container or wrapping and store in a cool dark area.

Example: **Developer_0001 Nail from [Name] Offshore Windfarm Zone Discovered by J.Bloggs 01/12/2010**

3 – Check the condition of the find regularly. Change the seawater when necessary and note any cracks or flaking.



The detrimental effects of rapid drying on iron shot

What do I do with a dry find?

If a find is dry do not to place it back into water. But it is still important to label it and place in a dark, cool place.

Further advice

Advice on conservation can be sought from the Portable Antiquities Scheme (PAS) which has a network of regional archaeologists (Finds Liaison Officers or FLOs). FLOs are responsible for recording finds reported by the public and providing advice. Contact details for your local officer can be found on the PAS website:

<http://www.finds.org.uk/involved/contacts.php>

Three rules

- Wet – Keep the object wet by covering with water in an appropriately sized container.
- Cool – The hotter something is the more likely it will corrode so place the artefact somewhere cool.
- Dark – Place the artefact away from direct contact with light, such as in a drawer or cupboard.

Things to avoid

- Supermarket bags – they contain harmful chemicals
- Drying – when wet finds dry quickly they crack and disintegrate
- Tissue paper – tissue will degrade in water
- Bubblewrap – textured wrapping can leave impressions on soft finds
- Placing different finds together – some types of material can be affected by contact with others
- Metal containers – metal can cause problems such as corrosion
- Glue – Some glues are harmful; if a find breaks don't fix it



Offshore Renewables Protocol

for Archaeological Discoveries



Handout 6: Prehistoric finds

Prehistoric finds

Some of the first things that spring to mind when you think of underwater archaeology are shipwrecks and aircraft wrecks. Whilst shipwrecks are important, there is a huge range of other exciting and significant artefacts that can be found under the sea.

Some of the most important finds from the seabed are stone tools. Stone tools are the oldest known technology used by man. These implements were first used in Africa 2.5 million years ago and until metal was discovered, stone was the primary resource for making tools.

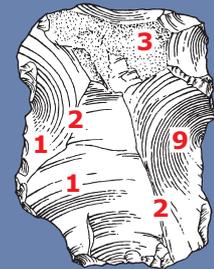
Whilst a large majority of tools are made from flint, in places where this was not available other stones were used instead.

It is not only the tools which are of interest to archaeologists, flint-knapping produces piles of waste flakes. Archaeologists examine the flakes to see what sort of tools were being made.

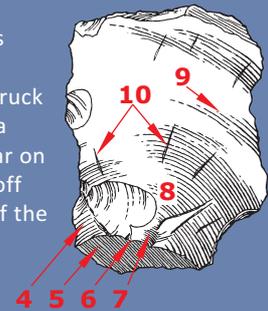
See below for some examples of handaxes, arrowheads and flakes.

How to recognise stone tools and flakes

Stone tools and flakes have recognisable features and shapes that indicate they were made by humans. The **negative flake scars** and **bulb of percussion** are some of the easiest to find.



The **bulb of percussion** is a curved raised lump left behind when a flake is struck off. The **negative scar** is a concave cone-shaped scar on the flake where it came off the core - the opposite of the bulb of percussion.



- | | |
|-------------------------------|------------------------------|
| 1 Negative Flake Scars | 6 Point of Percussion |
| 2 Ridges | 7 Cone of Percussion |
| 3 Cortex | 8 Bulb of Percussion |
| 4 Bulb Scar | 9 Conical Ripples |
| 5 Butt | 10 Fissures |



Offshore Renewables Protocol

for Archaeological Discoveries



Handout 7: Metalwork and Concretions

Metalwork and Concretions

What is a concretion?

Concretions are dense clumps of hard material that develop on the surface of iron or other ferrous metals as they corrode. A concretion can form one clump around an object or become large sections on iron shipwrecks. Within a concretion the object gradually corrodes away, sometimes leaving only a hollow space. It is easy to see if a concretion has been freshly pulled off an iron object as it has a bright orange rust colour.



Why are concretions important?

Concretions can easily hide the shape of an object, making them impossible to identify. However you should not assume that concretions are unimportant; x-rays can sometimes reveal what lies underneath the concretion, or injecting filler can make a mould of the hollow shape.

Recording

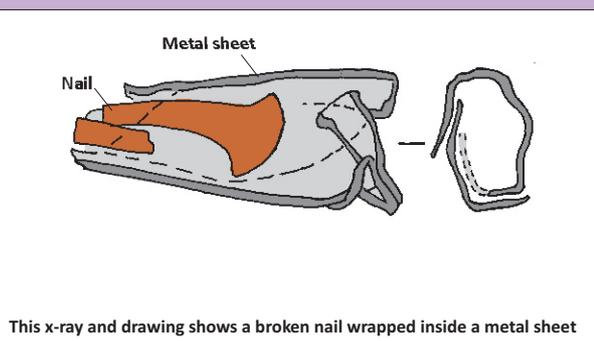
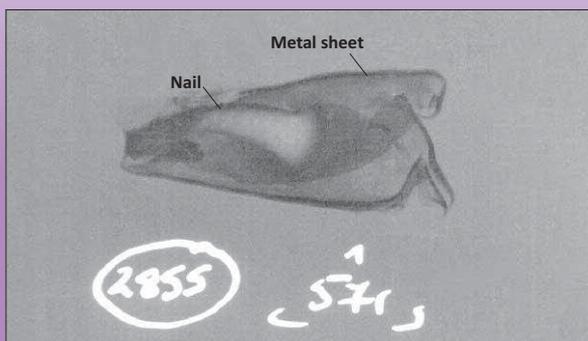
As with other types of artefacts, the more information we have the better. When recording concretions useful information includes length, width, diameter and thickness of concretion, where possible.

Keep your eyes peeled

Some people miss concretions as they can look like rocks from the seafloor. If you find something you're not sure about, report it.



A concretion can look like a rock



This x-ray and drawing shows a broken nail wrapped inside a metal sheet

Offshore Renewables Protocol

for Archaeological Discoveries



Handout 8: Munitions and Ordnance

Munitions and Ordnance

Always follow Company Guidelines on the **SAFE TREATMENT OF MUNITIONS** when they are discovered

Despite long periods spent underwater munitions can still be extremely dangerous and should always be treated with caution. The appropriate response when dealing with munitions is to report them to the police, coastguard or Ministry of Defence in line with your company policy.

How common are munitions?

Up to 10% of the bombs that fell on and around the UK during WWII failed to function and so far only a fraction of these have been recovered. In addition to these 'blind' munitions, ordnance from both world wars was dumped at sea and munitions on board sunken vessels are rarely salvaged.



Fuse cap



Reporting munitions

Always follow safe working procedures when dealing with munitions. Before reporting munitions via the PAD they must be made safe or identified as inert by the police or a military Explosive Ordnance Disposal Officer (EOD). Once the items have been confirmed as safe and suitable for handling they should be reported as normal through the protocol. If you have any queries regarding the reporting of munitions please contact a member of the Implementation Service team.



Vis or Random pistol



German WWII machine gun



Ammunition



Appendix 8B – Protocol for Geological/Paleontological Discoveries

| Construction Environmental Management Document | |
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8B Protocol for Geological/Paleontological Discoveries

8.1 Scope

Dalgleish Associates Ltd (DAL) has been commissioned by Staffin Community Trust to prepare a Protocol for Geological/Paleontological Discoveries for the operations at Lealt Borrow Pit project, as required by Planning Condition 4 of Planning Permission 21/04525/FUL. The condition is as follows:

"No development or work shall commence until the Planning Authority has approved in writing the terms of appointment by the developer of an independent and suitably experienced geologist (preferably a palaeontologist) in consultation with NatureScot. The terms of employment shall include a production of a watching brief for the duration of the quarrying activity, and this shall include site inspections at key stages of the quarrying process and provide an overview of the proposed monitoring and reporting process."

In addition, Planning Condition 5 of Planning Permission 21/04521/FUL also states that:

"No development or work shall commence until the Planning Authority has approved in writing the terms of appointment by the developer of an independent and suitably experienced geologist, (preferably a palaeontologist) in consultation with NatureScot. The terms of employment shall include the production of a watching brief for the duration of construction. The carrying out of a risk assessment for work on the site, a visual inspection will be undertaken before work commences and when the slipway stones are removed (uncovering underlying rock exposures) and providing construction staff training which include awareness of fossils and information on the Scottish Fossil Code. In addition, the appointee shall co-ordinate the measures as detailed in section 12.6.1.3 of the Environmental Impact Assessment Report September 2021 in the event that fossils are found."

As such, the Protocol for Geological/Paleontological Discoveries developed will also be applied to the Staffin Community Harbour (SCH) improvement works.

8.2 Geological and Palaeontological Team

8.2.1 Dalgleish Associates Ltd

DAL is an independent geological, planning and minerals consultancy, with over 30 years' experience in the UK quarrying industry. Michelle Latimer will be the appointed 'independent and suitably experienced geologist', with over 22 years' experience as a Geologist and Geotechnical Specialist within the UK quarrying and site investigation industry.



8.2.2 Dugald Ross

Dugald Ross is a local palaeontological expert, having over 40 years' experience of fossil identification, safeguarding and reporting of important fossil finds within the Skye and Inner Hebrides region. His work has included removal of specimens after permissions have been granted by the relevant authorities.

Dugald established the Staffin Dinosaur Museum in 1976, with identified species in the locale including Stegosaurus, Megalosaurus, Cetiosaurus, Hardrosaurus and Ceolophysis. Dugald offers tours of the dinosaur footprints along the Staffin coastline, and therefore brings directly relevant experience to the team.

8.3 The Site

8.3.1 Site Location

8.3.1.1 Borrow Pit

Lealt is located some 5.5 miles to the south-south-east of Garafad, lying between the A855 road and the Lealt Gorge on the coast of the Trotternish Peninsula at National Grid Reference NG 51880 60620. The proposal is to re-establish workings at Lealt, as a borrow pit, providing hard rock for use in the proposed Staffin slipway project.

8.3.1.2 Harbour Development

The proposed Staffin Community Harbour development is located at the Staffin Slipway in Òb nan Ron, Garafad, Staffin in the north of Skye and has a grid reference of NG494 681. Access to the slipway is via a minor single tracked road off the A855. The road passes the public parking area for An Corran Beach, located approximately 500m north from the existing slipway. The area below the steep rocky cliffs, surrounding the slipway to the northwest, west and south, is common grazing land, before meeting the MHWS and transitioning into the rocky foreshore area.

8.3.2 Site Description

8.3.2.1 Borrow Pit

The development area for the borrow pit works extends to some 2.6ha. Previous workings have left a back-wall, some 6-8m in height adjacent to the road with a fairly level, slightly domed area of quarry floor at around 85-88m AOD, extending eastward towards the coast, there is a second sinking of around 6m to the east of the main floor level at around 81-82m AOD. The land falls steeply away to the south of the quarry access, into Lealt Gorge and to the east, and the south-east, to the bay at Inver Tote.



The borrow pit is screened from the road due to the workings being at a lower level than the road and by an intervening vegetated bund of previously stripped soils/overburden. Access to the borrow pit is directly from the A855. A little to the south-west of the quarry workings and to the north-east of the twin accesses to the Lealt Gorge car park from which a path leads to viewpoints for the Lealt Stream Waterfall and the old Diatomite furnace and mill down on the shore at Inver Tote.

The site is not recognised for its geological interest although there are interpretation boards highlighting the history of minerals extraction and processing in the area. There is scope to enhance visitor information with additional interpretation updating the information in relation to contemporary use and the continued value in such raw materials. The site is located approximately 100m from the Valtos SSSI, which is designated for its Bathonian features.

8.3.2.2 Harbour Development

The SCH area lies below steep rocky cliffs to the west, and is surrounded to the immediate northwest, west and south by grazing land.

The area is known for its geological/palaeontological interest and the An Corran Geological Conservation Review site (GCR) lies immediately adjacent to the development. This site benefits from protection under the Skye Nature Conservation Order (NCO) 2019.

8.3.3 Geology

8.3.3.1 Borrow Pit

Drift geology at surface is shown on published BGS mapping to comprise glacial diamicton till to the west of the site. The central and eastern sections of the site are documented as having no significant superficial cover; bedrock is at or near surface. Peat is shown to be present to the north-east of the development site, but not within the proposed borrow pit site boundary.

The solid geology underlying the borrow pit site is shown on published British Geological Survey (BGS) mapping to comprise intrusive igneous strata, predominantly sills of the Little Minch Sill Complex, within the North Britain Palaeogene Sill Suite, of Palaeogene age. These consist of undivided microgabbro, olivine basalt and dolerite. Observations during the site visit show that the average dip of the strata within the site is approximately 7° (1:8 or 12%) in a westerly direction. The dip represents surfaces of the individual lava intrusions within the igneous sill structure.

Immediately to the east and south-east of the proposed borrow pit site, strata belonging to the Elgol Sandstone Formation are exposed, directly underlying the igneous sill. This material is documented as comprising bioturbated, clay-rich sandstone, intercalated with silty fissile



mudstone. Some 120m to the west of the site, strata from the Lealt Shale Formation are documented, comprising limestone, sandstone, siltstone and mudstone.

The solid strata within the region are cut by several parallel faults, trending from the north-north-west to the south-south-east, with direction of displacement unknown. One of these fault lines is documented to lie immediately to the east of the borrow pit site, along the line of the incised burn channel.

8.3.3.2 Harbour Development

The British Geological Survey maps for the area of the Staffin Community Harbour development show the Duntulm Formation underlying the shoreline, slipway, and extending within Breun Phort to the east, with the Valtos Formation extending east of Breun Phort and along the shore, southwards. The rock exposures at An Corran are part of the Duntulm Formation and Valtos Formation.

There are no records of coal working within the vicinity of the proposed Staffin Community Harbour development. As such, it is not necessary to consult The Coal Authority records and mine abandonment plans.

8.3.4 Palaeontology

8.3.4.1 Borrow Pit

There have been no documented palaeontological discoveries at the site or the immediate surroundings. The target mineral to be extracted at Lealt Borrow Pit, for the development of the Staffin Slipway project, is an intrusive igneous sill, comprising microgabbro, olivine basalt and dolerite, with very low potential for palaeontological interest (such fossils are extremely rare and currently not known in any nearby exposures).

The sedimentary strata directly underlying the igneous sill is the Elgol Sandstone Formation, which comprises bioturbated, clay-rich sandstone, intercalated with silty fissile mudstone. Some 120m to the west of the site, strata from the Lealt Shale Formation are documented, comprising limestone, sandstone, siltstone and mudstone. It is possible that these sedimentary strata could be fossil-rich, and should therefore be inspected, if encountered.

8.3.4.2 Harbour Development

Although the proposed SCH development site is not located within an NCO, it lies directly adjacent to An Corran Geological Conservation Review Site. The NCO for this site prohibits the damage or removal of Jurassic vertebrate fossils. Fossils here comprise dinosaur footprints, dating to the Middle Jurassic.



An Corran GCR includes all of the land lying between the Mean Low Water Springs (MLWS) and the public road at An Corran Beach, and the MLWS and the public road at Garrafad (the slipway where the SCH development is proposed) (National Grid reference: NG 493 684).

In terms of its geology, An Corran GCR is significant for:

- Dinosaur Footprints:
 - Internationally and Nationally rare types of fossil;
 - Internationally and Nationally rare age of fossils, Middle Jurassic age (approx. 166 million years old);
 - The first in situ dinosaur footprints found on Skye, and by extension, Scotland; and
 - Focus for local, national and international tourism and education visits.

8.4 Site Procedures

The presence of fossils in the area will be included in the risk assessment for work on the site. This will ensure that construction staff are aware of the potential for fossils at both the SCH development area and the Lealt Borrow Pit. In addition, other measures will be included to ensure that paleontological discoveries are protected. These measures are outlined in 8.4.1 – 8.4.3.

8.4.1 Tool-Box Talks

A tool-box talk shall be delivered to site operatives by Michelle Latimer (DAL) in conjunction with Dugald Ross, prior to commencement of excavations at both the Harbour Development and the Borrow Pit. The tool-box talk shall cover the following topics:

- Geology of the area, including the two main rock types at Lealt;
- Palaeontological history of the local and wider area;
- Examples of fossil discoveries in the wider area;
- The Scottish Fossil Code (<https://www.nature.scot/doc/scottish-fossil-code>);
- How to recognise a fossil; and
- Procedures for any suspected fossil discoveries.

8.4.2 Site Inspections

The presence of fossils in the area will be included in the risk assessment for work on the site. Detailed site inspections shall be undertaken by Dugald Ross during both the Harbour Development and the Borrow Pit, specifically at the following stages:

- Prior to the commencement of works;
- At commencement of excavation works;



- At any point during the development when the possibility of the underlying sandstone strata being exposed has been identified, either by drilling and blasting, or excavation using alternative methods;
- At any point during the development when materials such as cobbles, boulders, armour stone, are moved with the potential to reveal underlying bedrock;
- At any point where a change in geology is noted (and had not been anticipated);
- At any point where a palaeontological discovery is identified or suspected; and
- At completion of excavation works.

Photographs of the condition of the site shall be taken during all inspections and kept on record.

The drilling operations shall also be closely monitored by Dugald Ross on site, and if there is a possibility that underlying sedimentary strata shall be encountered, drill chippings/flush returns shall be inspected. If any chippings/returns indicate that the underlying sedimentary strata are being disturbed, the site management shall be informed and drilling/blasting operations temporarily ceased, until further inspection and review of blast proposals can be undertaken.

If blasting is undertaken which is considered likely to affect underlying sedimentary strata, the base of excavation shall be examined by Dugald Ross/Michelle Latimer. Any evidence of fossil discoveries within the sedimentary strata shall be reviewed, additional specialist advice sought as necessary, recorded, and reported. This includes visual inspections when slipway stone are removed (uncovering underlying rock exposures).

Communication between site operatives, Dugald Ross, Michelle Latimer and Site Management shall be undertaken via phone calls, emails and messenger services, as appropriate, and photographs of the site's current condition shall be shared regularly. Any concerns regarding the geology and palaeontology at the site should be discussed and photographs shared.

8.4.3 Key Intervention Points

At the least Borrow Pit, if any of the following ground conditions are encountered during the excavation operations or during site inspections under the Watching Brief, site excavation operations shall be temporarily suspended until further detailed inspection can be undertaken, and additional specialist advice sought, as necessary:

- Change in geology, for example changing from igneous sill to sedimentary strata;
- Any noticeable fossil discovery.



At the SCH development area, if at any time during the development, site operatives believe they have made any fossil discovery, works in that area will pause and a detailed inspection shall be requested.

If detailed inspections at either the Harbour development or the Borrow Pit show that there is no evidence of fossiliferous discoveries, site operations shall be allowed to recommence.

If, however, the detailed inspection shows potential for fossiliferous discoveries, the immediate site works shall remain on hold and the inspection area photographed and recorded, as required.

If the find is confirmed to be a fossil, the next stage is to determine the significance of the find. If it is not significant, construction may either continue, or the fossil may be removed by those with the licence and experience to do so, and placed in an appropriate museum (e.g. Staffin Dinosaur Museum or National Museums Scotland). Information on the location of the fossil and geological context will be collected, in accordance with the Scottish Fossil Code.

In the event that they are significant fossils (e.g. dinosaur trackways, or dinosaur or other vertebrate bones), additional specialist advice will be sought and the team shall work in consultation with NatureScot to:

- Record the discovery *in situ* using photography, photogrammetry;
- Remove the fossil material as appropriate; and
- Collect any other information necessary for the study and publication of the fossil(s).

8.5 Reporting

8.5.1 Site Inspections

A written summary, including labelled photographs, of all site inspections by the Watching Brief shall be reported to Site Management, at intervals throughout excavation operations.

8.5.2 Key Intervention Reporting

If any Key Intervention Points are encountered, they shall be reported immediately to Site Management, and inspected in greater detail by the Watching Brief.

If fossils are found, follow the Scottish Fossil Code, and do the following:

1. The provided contacts should be consulted to confirm the find is a fossil. In the first instance this will likely include staff from the Staffin Dinosaur Museum or NatureScot.
2. If the find is confirmed to be a fossil, the next stage is for a professional palaeontologist to determine the significance of the find. If it is not significant, construction may either continue, or the fossil may be removed by those with the licence and experience to do



so, and placed in an appropriate museum (e.g. Staffin Dinosaur Museum or National Museums Scotland). Information on the location of the fossil and geological context will be collected, in accordance with the Scottish Fossil Code.

3. In the event that they are significant fossils (e.g. dinosaur trackways, or dinosaur or other vertebrate bones), a professional palaeontologist should work in consultation with NatureScot to:
 - a. Record the discovery in situ using photography, photogrammetry;
 - b. Remove the fossil material as appropriate; and
 - c. Collect any other information necessary for the study and publication of the fossil(s).

8.5.3 Reporting on Completion of Operations

A written summary of site operations on completion of works, including labelled photographs, shall be compiled, and forwarded to The Highland Council and NatureScot.

8.6 References

NatureScot. (2022). The Scottish Fossil Code. Accessed 31 March 2022 from <https://www.nature.scot/doc/scottish-fossil-code>

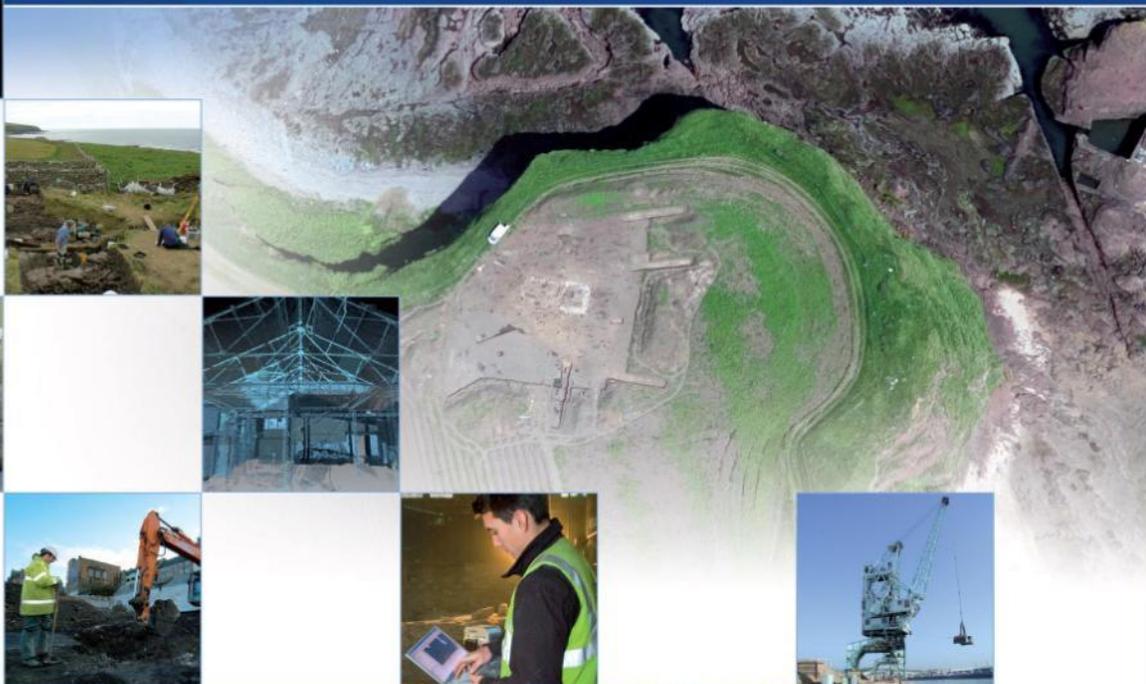


Appendix 8C – Written Scheme of Investigation

Staffin Harbour, Portree Archaeological Evaluation Written Scheme of Investigation

December 2021

AOC Project Number: 70622



ARCHAEOLOGY

HERITAGE

CONSERVATION

Staffin Slipway Road and Harbour Improvements

Archaeological Evaluation & Watching Brief

Written Scheme of Investigation

| | |
|---------------------------------------|---|
| On Behalf of: | Staffin Community Trust c/o Jock Gordon Design & Planning 18 Garafad Staffin Isle of Skye IV51 9JX |
| Planning References: | 21/04276/FUL & 21/04521/FUL |
| National Grid Reference (NGR): | NG 49042 68568 |
| AOC Project No: | 70622 |
| Prepared by: | Fiona Jackson and Mary Peteranna |
| Date: | 16 th December 2021 |

This document has been prepared in accordance with AOC standard operating procedures.

Author: Fiona Jackson

Date: 16th December 2021

Approved by: Mary Peteranna

Date: 30th December 2021

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1.0 INTRODUCTION

- 1.1 An archaeological evaluation is required by Staffin Community Trust for the proposed improvements along the Staffin Slipway Road and Harbour area (Highland Council Planning Refs: 21/04276/FUL & 21/04521/FUL). The requirement has arisen as the development site is located in an area with potential for the survival of buried archaeological deposits and Mesolithic material.
- 1.2 The site lies within the administrative area of the Highland Council, which is advised on archaeological matters by Kirsty Cameron, Archaeologist, Historic Environment Team, Highland Council. A programme of archaeological evaluation has been specified in keeping with the policies outlined in *Scottish Planning Policy* (2014) and *PAN 2/2011 Planning and Archaeology* (2011) in order to record the extent and significance of any archaeological remains which may be present within the development area.
- 1.3 This *Written Scheme of Investigation* details how the requirements of the project will be met. The first part is site specific while the Appendices detail AOC Archaeology Group's operating procedures and standards. All work will be conducted in accordance with the Highland Council *Standards for Archaeological Work* (2012) and the Chartered Institute for Archaeologists' (CIfA) *Code of Conduct* (2019).

2.0 BACKGROUND

- 2.1 The slipway road at Staffin is located to the northeast of Staffin and is accessed from the A855. It encompasses a 1.62km road running along the northeast coastline of Staffin terminating at Staffin Harbour (**Figure 1**). The road improvements consist of enlarging laybys, verge repairs and some road widening at 15 locations identified along the existing road, along with the erection of a substation building. The proposed harbour improvements consist of erection of WCs, office, storage sheds, parking spaces, installation of septic tank, diesel fuel tanks and upgrading of existing private water supply.
- 2.2 There are two Scheduled Monuments located within 100m of the development area (**Figure 2**). *Staffin House shell midden* (SM7848) is located approximately 30m to the southwest of improvement location 11. The site consisted of a rock shelter containing a series of shell middens dating from Mesolithic to Early Iron Age, hearths and an Iron Age copper-alloy pin. The lower layers contained a shell midden material of Mesolithic date containing bone and lithic tools, and faunal remains. Approximately 400m to the southwest of SM7848 and 100m to the southeast of improvement site 6 lies the remains of Carn Ban (SM3517), a large circular kerb cairn of Neolithic date. A further Scheduled Monument is noted approximately 200m to the southwest of the slipway, Garafad (MHG5748; SM3510) is a depopulated settlement comprising 22 ruined houses of unknown date.
- 2.3 The rock shelter referred to as SM7848, the Staffin House shell midden, was more informally known as An Corran rock shelter. It was excavated in the early 1990s (Hardy et al. 2012), when approximately one-fifth of the rock shelter deposits were excavated. Below hearth settings and midden layers, there was an underlying shell and animal bone midden with an assemblage of

Mesolithic bone and stone tools. The manufacture of microliths by the microburin technique, using locally available siliceous and basaltic materials, was identified. A radiocarbon date from a red deer bone bevel-ended tool provided a determination of 7590±90 BP (OxA-4994) (Birch 2021).

2.4 Further survey work at Staffin as part of the Scotland's First Settlers project and later monitoring (MHG35899; Birch 2021) identified a large quantity of lithics scatters between An Corran rockshelter and the Stenscholl River (**Figure 3** (per Birch 2021)). The survey identified large notable assemblages dating from early Mesolithic to Neolithic, particularly in areas where re-cutting of roadside ditches 'across the wave-cut platform leading from An Corran' (Birch 2021). Birch has provided specific notes for the assemblages at each location demarcated on the Figure 3 plan.

2.5 The proposed road improvement locations correlate with the following sites reported by Birch:

Location 4 – Sites G and F1

Location 5 – Site F3

Location 6 – Site D3

Location 7 – Site C1

Location 8 – Sites C6 and B

The summary of the site descriptions (Birch 2021) are as follows:

- **An Corran G** (NGR NG 4853 6815) – Three lithics were recovered from disturbed ground immediately to the east of the bridge over the Stenscholl River, and to the SE of the road.
- **An Corran F** (NGR NG 4861 6827 (centred)) – The open ditch was situated to the SE of the road and displays exposures of a well-sorted plough soil most likely deriving from the lazy-bed cultivation plots, which the road and ditch have dissected. Lithic material was recovered from the watery base of the ditch and from various horizons within the soil matrix a larger amount of lithic material comprising baked mudstone and chalcedonic silica/chert.
- **An Corran D** (NGR NG 4864 6836) – This site, centred near to the cottage of Cairnrobin, and is located on the raised beach platform at 10-12 metres OD. The original lithic assemblage recovered from the site during SFS fieldwork in 1999, as collected primarily from an open ditch containing a small stream and from animal rubs/erosions towards the front edge of the platform. Location D3 was described as erosion at the front edge of the raised beach, mainly caused by animal activity (sheep rubs), and drainage channel extending to SE up terrace.
- **An Corran C** (NGR NG 4877 6840) – This site was discovered during SFS fieldwork in 1999, the small lithic assemblage collected from erosion features at the cliff-edge and animal rubs. This site is situated at 15m OD on the wave-cut rock platform, generally grass-covered with small areas of outcropping bedrock, with evidence of relict lazy-beds. The present road to Staffin slipway dissects the site. The ground conditions consist of a stony matrix and mixed material, including modern detritus, where lithic material has been recovered from erosions and ditches to either side the road, and eroding rock-faces and animal rubs. Some of the material (from talus slopes and an old ground surface), was found to be badly abraded. Lithic material was collected from 8 locations around this site:

- C1 – An area of erosion on the main wave-cut platform where small angular stone and some rounded pebbles were found on the surface where the grass had died away
 - C2 – At the NW edge of the wave-cut platform, erosion of the cliff face and the overlying soil has taken place. Lithic material was found eroding from the soil, lying on the exposed rock surfaces and within the talus of collapsed material at its base. This process has most likely been taking place since the site was first occupied
 - C3 – On the edge of the road where it turns sharply around a bend, lithic material was recovered from the road edge on the NW side and SE of this bend around an eroding low cliff face
 - C4 – Erosion from wind and sheep rubs surrounding a low and rocky knoll
 - C5 – Erosion and exposed ground surface on the rising ground to the SE of the road and up the hill
 - C6 - A silted ditch on the SE side of the road where lithic material has been recovered from the base of the ditch and from lazy-beds on the uphill side of the ditch.
 - C7 – A talus slope containing collapsed cliff material and erosions where some modern material is also present
 - C8 – Erosions at the cliff edge, on the NE side of the wave-cut platform, showing a well-sorted soil sitting directly on the rock platform
- **An Corran B** (NGR NG 4885 6851) – This site discovered during the SFS 1999 coastal survey is situated on a wave-cut rock platform at 15m OD, which has a varying thickness of overlying soil. The surface of the plateau is generally level and grass covered, and there is evidence of lazy-bed cultivation in some areas. At the front edge of the platform, which gives way to 8-10 metres high basalt cliffs, animal erosions and general weathering have produced material. In some places, topsoil has been completely eroded away to leave the bare surface of the basalt plateau where lithics were found lying on the surface. Lithics were also recovered from the eroding animal rubs and eroding soil surfaces, some from the upper layers of the plough soil. On the SE side of the road a small number of lithics have been recovered from the roadside ditch, suggesting that the site may extend onto the flat terrace on the SE side of the road.

2.6 Close to the Staffin Road (near road improvement locations 5-6, Figure 2), an archaeological excavation was undertaken in 2015 by the UHI. The fieldwork revealed two phases of activity comprising a Mesolithic horizon featuring a series of deposits dated between 6800-6600 cal BC. An assemblage of lithics contained cores, microliths and microburins alongside burnt hazelnut shell and burnt animal bone (Lee 2016).

2.7 The proposed development includes a programme of road widening along the Staffin Road to the pier and developments for a new substation, new WCs and office, new storage sheds and improvements to the slipway. There is good potential for archaeological remains, and particularly lithic assemblages, to survive sub-surface in areas where new ground-breaking works are proposed. This Written Scheme of Investigation covers the methodology for the archaeological evaluation in order to fulfil the requirements outlined in the planning conditions

21/04276/FUL & 21/04521/FUL. The results of the fieldwork will provide information on the archaeological baseline of the site.

3.0 Objectives

3.1 The *Chartered Institute for Archaeologists* (CIfA) defines an archaeological evaluation as ‘a limited programme of non-intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land...field evaluation defines their character, extent, quality and preservation, and enables an assessment of their worth in a local, regional, national or international context as appropriate (2020).’

3.2 The aims of the archaeological works are:

- i) To establish the presence or absence of archaeological remains within the proposed development area
- ii) To remove by hand any overburden in order to expose the archaeological deposits
- iii) To excavate, sample and record any features or to propose arrangements for their safeguarding, where possible
- iv) To sample deposits for post-excavation work, including environmental analysis and dating
- v) To make recommendations for further measures necessary to mitigate the impact of the development
- vi) To make recommendations for post-excavation work

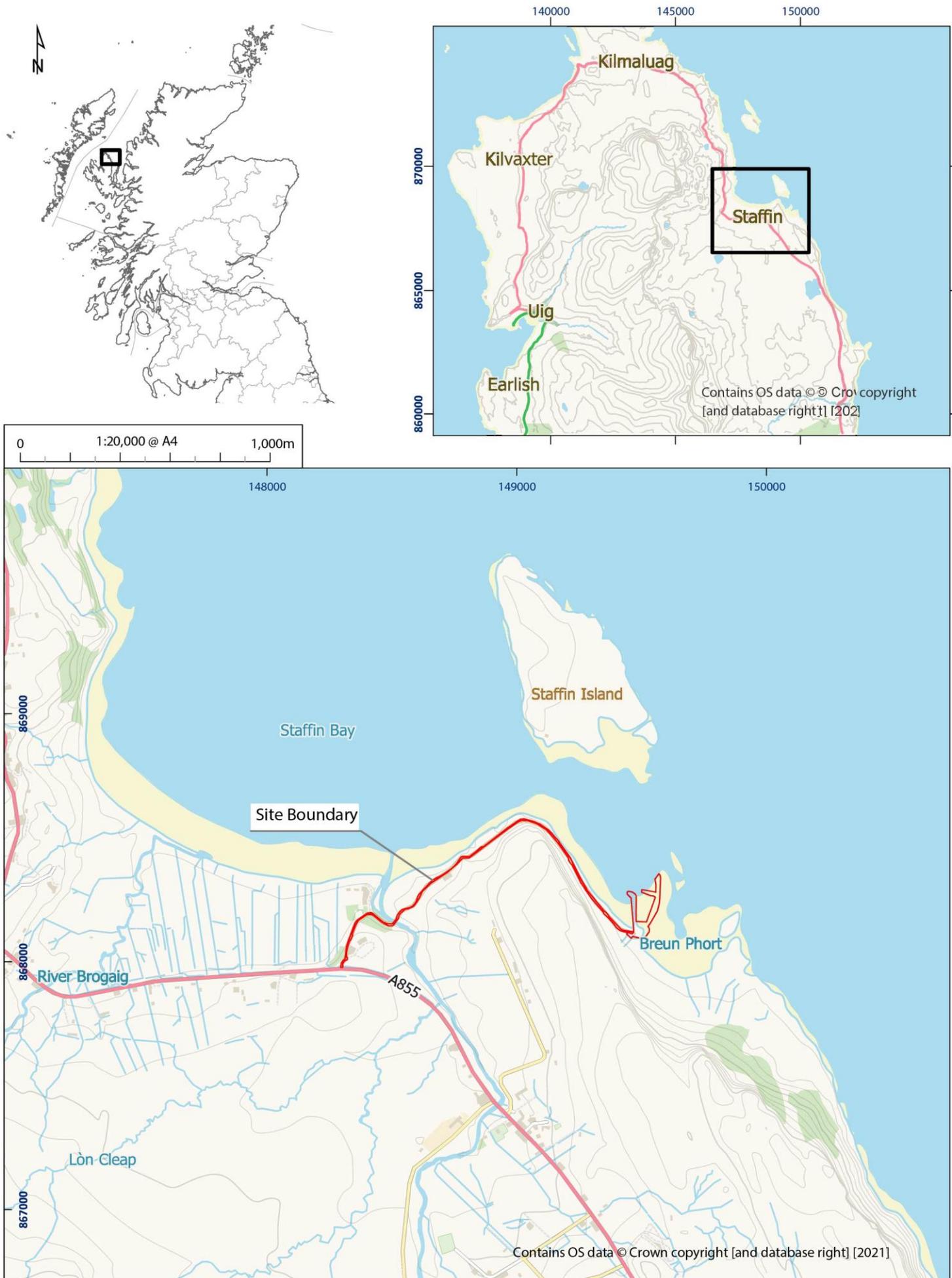


Figure 1: Site location plan

04/70622/WSI/01/01



Contains OS data © Crown copyright [and database right] [2021]

Figure 2: Work locations



Figure 3: Location of lithic sites and An Corran rock shelter (Birch 2021)

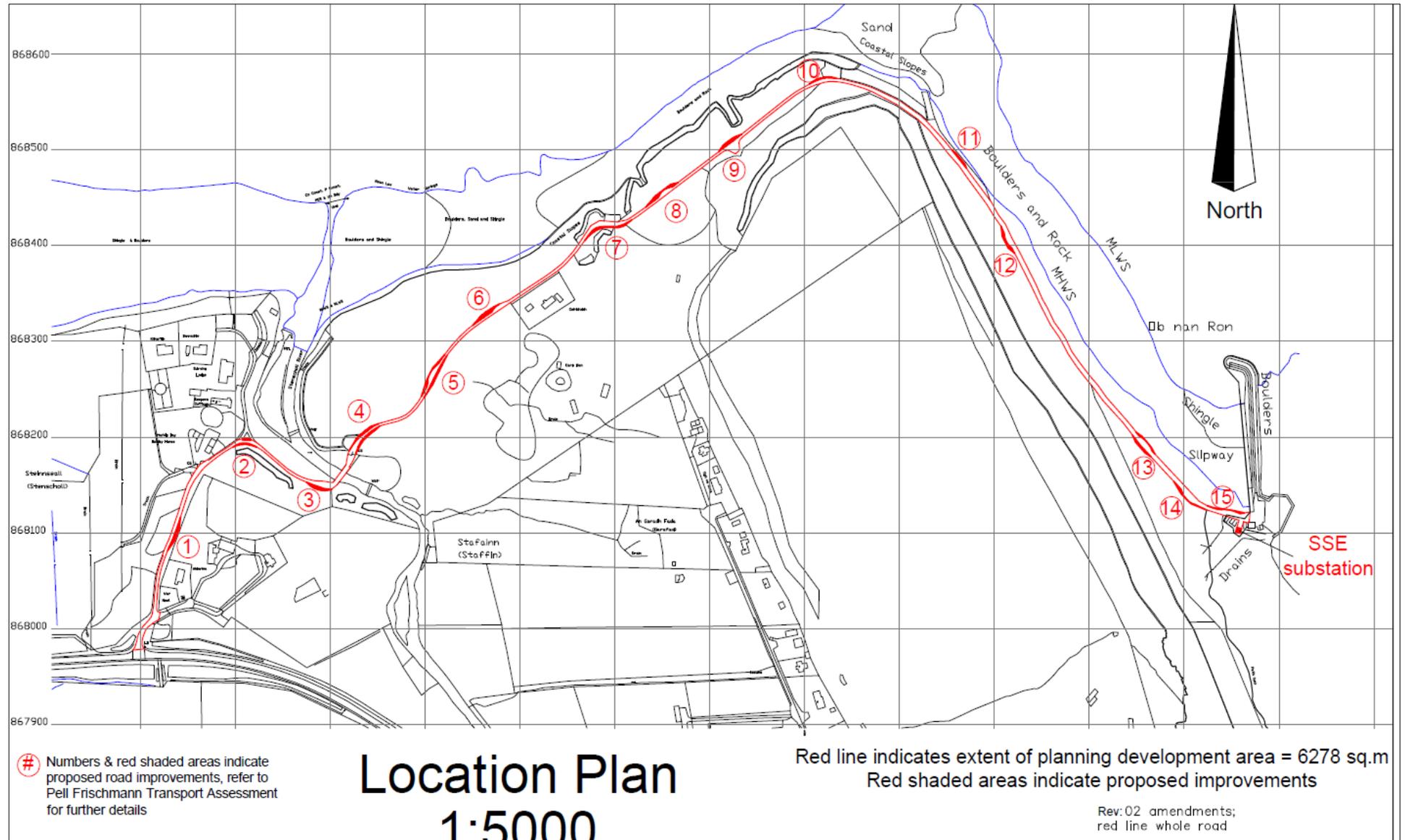


Figure 4: Location of road improvement locations (client plan excerpt)

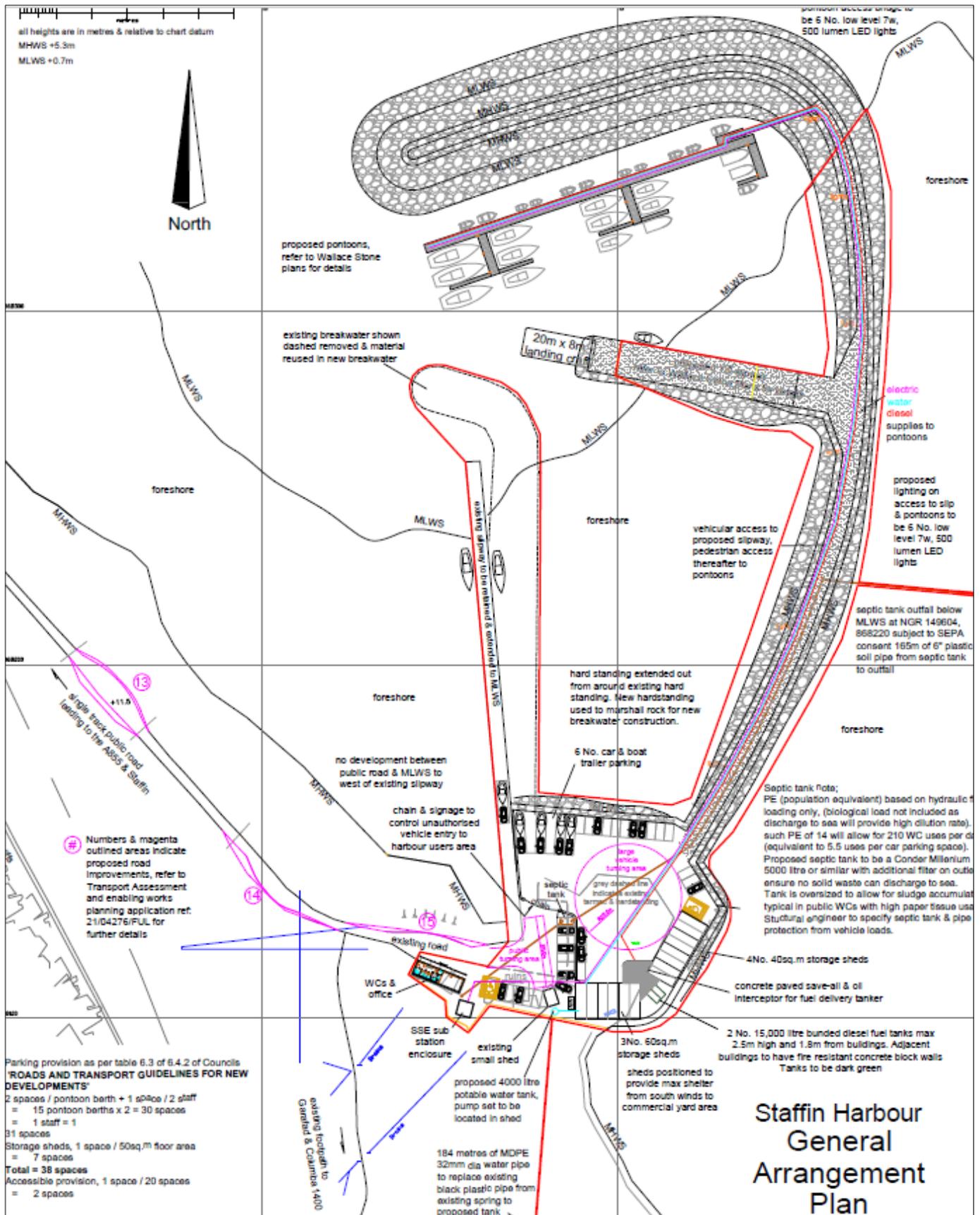


Figure 5: Location of proposed harbour development (client plan excerpt)

4.0 PROGRAMME OF ARCHAEOLOGICAL WORKS

4.1 Road improvement works

4.1.1 A series of test pits will be dug across Staffin Road, focussed on the location for road improvements designated by the client in **Figure 4**. The purpose of the work is to assess the baseline archaeological potential of each of the locations. As discussed in Section 2.5 and shown on Figure 3, Locations 4-10 (**Plates 1, 2**) are located in areas where significant prehistoric lithics finds have been made and are located in favourable landscape positions on the wave-cut terrace described by Birch (2021).

4.1.2 An assessment of the archaeological potential at Locations 1 – 15 (Figures 2, 4) will be made by undertaking hand-dug test pit excavation at each of these sites. It is proposed that a test pit will be sited in the best position at each of these sites, for the excavation of one test pit, measuring at least 1m by 0.5m, at each of the designated road improvement locations. Further test pits or shovel pits may also be excavated depending upon the on ground conditions and initial results at the time.

4.1.3 During test pit excavation, all deposits will be hand sieved using a quarter-inch mesh soil griddle to allow for the greater recovery of lithics. Stratified layers will be sampled for potential environmental assessment. Test pits will take into consideration the possibility of unidentified services being located and all test pits will be backfilled to a basic standard on completion.



Plate 1: Looking west from road improvement location 7 to 5 (© Google Streetview)



Plate 2: Looking west from road improvement location 10 to 7 (© Google Streetview)

4.2 Harbour development

4.2.1 Trench evaluation

The proposed development at the harbour (**Figure 5**) will include construction of new sheds, parking, offices, substation and water main renewal; alongside refurbishment of the slipway and pier. The archaeological evaluation will include excavation of machine-dug test trenches across areas requiring new ground-breaking.

The siting of trenches will be determined on site depending upon ground conditions and areas available for assessment. An archaeologist will direct digging by a machine fitted with a **straight-edged** bucket in order to establish the presence or absence of archaeological remains within the site.

All features of archaeological significance will be excavated by hand in order to establish the date, nature, extent and state of preservation of the deposits. Archaeological features and deposits will be drawn at a scale of 1:20 and section drawings will be drawn at a scale of 1:10. All finds will be retained, and significant archaeological features will be sampled, in the event post-excavation analysis is deemed necessary.

4.2.2 Measured survey

The archaeological evaluation will include a measured survey of the existing boat nausts located at the harbour (per the *Environmental Impact Assessment* by Affric in 2021). The survey will include a level 1 building survey, to include site plans and digital photography of the structures, to be undertaken prior to the dismantling of the structures.

4.2.3 General methodology

The location of all archaeological test pits, evaluation trenches, historic building survey sites, significant findspots and features, will be plotted using a Trimble R8s capable of centimetre accuracy. The archaeological evaluation will be recorded using high resolution digital photography in order to record the process as well as any archaeological features or finds of interest.

Where small discoveries (those requiring less than two hours to deal with) are encountered, these will be excavated and recorded in accordance with AOC Archaeology's standard practice (Appendix 7.9-7.11).

Where larger discoveries are made (those requiring more two hours to deal with) AOC Archaeology will immediately inform the client, to describe the features and propose a mitigation strategy if appropriate for their excavation. If the Highland Council archaeologist agrees to these works a supplementary method statement will be prepared, and the arrangements confirmed by email. All excavation works will be undertaken in accordance with AOC Archaeology's standard procedures (Appendix 9).

Should human remains be uncovered these will be treated in accordance with Scots Law, standard AOC Archaeology policy (Appendix 7.12), *CIfA* standard practice and in keeping with Historic Scotland's *The Treatment of Human Remains in Archaeology* (2006). Any human remains which are encountered will initially be left *in situ*. Their removal will be a matter of discussion with the client and The Highland Council (who must be notified within 12 hours of their discovery). The police will also be informed prior to the removal of any bone material.

In the event of extensive significant archaeology being encountered, AOC Archaeology would request an on-site meeting with the client and the Highland Council archaeologist to discuss an appropriate mitigation strategy for further work.

Following on from fieldwork, recommendations may be made for a programme of post-excavation artefact or ecofact analysis and publication (if appropriate). This will be **fully funded by the client** in accordance with a negotiated mitigation strategy that will comply with the Conditions for Planning Consent. In the event that post-excavation work is not consented by the client within three months of fieldwork, the client will incur costs for all storage requirements of the archaeological assemblage.

5.0 REPORTING

- 5.1 Within one month of the completion of all fieldwork the results of the archaeological works will be presented in the form of a written report. This report will synthesise the results of the fieldwork and determine the significance and extent of any archaeological features identified.

- 5.2 The report will take the form of a Data Structure Report, prepared in accordance with current Highland Council and *CIfA* procedural requirements and AOC Archaeology standard procedures. Specifically the Data Structure Report will contain the following:
- A full descriptive text detailing any features identified and an interpretation of their date and purpose
 - Plans at an appropriate scale showing the location of works and any features located
 - Appropriate lists and diagrams summarising the contexts and artefacts recovered and the records made of them
 - Analysis of the results of the works, including appropriate post-excavation appraisals
- 5.3 PDF copies of the report will be supplied to the client for distribution to the relevant bodies once the report has been approved by the client and the Highland Council.
- 5.4 The catalogued archive from these works will be prepared for deposition in the National Record of the Historic Environment within 6 months of the completion of all fieldwork. Digital copies of a selection of photographs and plans will be deposited separately for inclusion in the Council SMR.
- 5.5 Finds of objects will be subject to the Scots Laws of Treasure Trove and *Bona Vacantia* and reported by the archaeological contractor to the Secretariat of the Treasure Trove Panel for disposal to an appropriate museum. This process is a standard AOC procedure.

6.0 TIMETABLE

- 6.1 The archaeological evaluation is expected to commence on the 10th of January 2021.

7.0 OPERATIONAL FACTORS

7.1 Health & Safety

- 7.1.1 AOC Archaeology has always maintained high standards on-site and a copy of our Health & Safety policy can be supplied on request. The Project Officer will prepare appropriate documentation, including a Risk Assessment, for inclusion in the site's Health & Safety Plan. A copy of the forms will be provided to the client and any on-site contractors as required. This Risk Assessment will be revised and updated on site daily by surveyors in order to reflect new and unforeseen site-specific hazards.
- 7.1.2 All staff will be familiar with health and safety procedures prior to commencement of fieldwork, including emergency procedures and location of first aid supplies and medical support. AOC field staff are qualified First Aiders.
- 7.1.3 AOC will request any information on access, ecological and service constraints from the client. Measures for dealing with any arisings will be fully detailed in the Risk Assessment.

7.2 Project Team and Facilities

7.2.1 This project will be managed by **Mary Peteranna**, Operations Manager, Inverness.

7.2.2 Any resultant post-excavation analyses or conservation would be conducted by AOC Archaeology's in-house specialists and supervised by Dr Ciara Clarke MClfA who specialises in palaeoenvironmental issues (Appendices 23 & 24) and/or Ms Gretel Evans, Conservation Sector Manager (Appendix 25).

7.2.3 AOC Archaeology has all the facilities necessary to undertake all resultant works, including fully equipped conservation and palaeoenvironmental laboratories, secure storage and walk-in refrigeration units.

8.0 REFERENCES

Birch, S. 2021. Staffin Bay Lithic Scatter Sites. An Corran, Staffin, Skye. Unpublished report.

Chartered Institute for Archaeologists (ClfA) 2019. *Code of Conduct*.

Chartered Institute for Archaeologists (ClfA) 2020. *Standards and guidance: Archaeological evaluation*.

Highland Council 2012. Standards for Archaeological Work.

Highland Council 2021. *Highland Historic Environment Record*. Accessed online at: her.highland.gov.uk

Historic Scotland 2006. The Treatment of Human Remains in Archaeology.

Scottish Government 2011. PAN 2/2011 Planning and Archaeology.

Scottish Government 2014. *Scottish Planning Policy*.

APPENDIX 1

Desk-top assessment

1.1 The sources consulted as part of the desk-top study will depend on the type and level of data required and the material that is available to provide that information. Sources used may include, where available, all or some of the following listed below:

i) Walkover survey (Appendix 5).

- ii)* The relevant Local Sites and Monuments Record(s) and the National Monuments Record.
- iii)* British Geological Survey maps.
- iv)* Ordnance Survey maps of the site and its locality.
- v)* Tithe, Apportionment and Parish maps.
- vi)* Historic (pre-Ordnance Survey) and Estate maps of the area.
- vii)* Appropriate archaeological and historical journals and books.
- viii)* Historical documents held in local museums, libraries, record offices and other archives. This may be a selective survey given the scope of potential historic documentation for some sites.
- ix)* Unpublished material held by local professional and amateur archaeological organisations and museums.
- x)* Aerial photographs held by local authorities, Sites and Monuments Record, the National Library of Aerial Photographs, Cambridge University Collection of Aerial Photographs and other local parties.
- xi)* Scheduled Ancient Monuments Lists; listed building lists; registers of parks and gardens and battlefields; any local authority constraint designations (e.g., conservation Areas).
- xii)* All available borehole, trial pit and geotechnical data from the site and its immediate environs.
- xiii)* Plans of services locations held by statutory undertakers.
- xiv)* Fire insurance maps.
- xv)* Old and New Statistical Accounts (in Scotland).
- xvi)* Building Control Records.
- xvii)* Standing Building Assessment (Appendix 10).

APPENDIX 2

Geophysical survey

- 2.1 All geophysical survey work will be sub-contracted to an appropriate professional organisation but directly managed by AOC Archaeology.
- 2.2 Selection of techniques will be made in consultation with the survey organisation taking into account land use, geology, complicating factors (e.g. metal pipes and fences), known and/or suspected archaeology.
- 2.3 The report will contain background information on the site (as above) and a description of any anomalies located. An interpretation of the anomalies will also be given.

- 2.4 At least one plot of the data will be included, normally of dot density or grey scale type. Any enhancement of the image will be explicitly stated and the likely affect of the processing described.
- 2.5 Clear interpretative plans will be provided in a form that a non-technical reader can understand.
- 2.6 Plots and interpretative diagrams will be reproduced at a scale from which exact measurements can be taken. These will normally be 1:1000 for detailed survey and 1:2500 for other plans.
- 2.7 The basic computerised data will form part of the site archive.

APPENDIX 3

Surface collection survey (fieldwalking)

- 3.1 This type of survey will only be carried out in suitable ground visibility conditions. This effectively restricts the technique to arable land which has been ploughed, harrowed and left to weather for several weeks in autumn to early spring.
- 3.2 The collection grid will align with the Ordnance Survey grid unless surveying for a linear scheme when the transects will be parallel to the centre of the scheme. The grid will be established using measured survey techniques.
- 3.3 The spacing of transects and length of collection units will be as specified in the main part of the Written Scheme of Investigation. Each transect will be 2m wide. Collection units will be logged using a numeric 12 figure National Grid Reference which will identify the southern end of the unit.
- 3.4 Transects will be measured cumulatively on the ground using fixed-length strings to avoid variation in individual pace. Sighting poles will be placed at opposite ends of the land parcel to mark transects.
- 3.5 All material considered to be man-made or not local to the area will be collected and recorded by the individual collection unit. The exception to this is where dense concentrations of building material are present when a representative sample is retained per collection unit.
- 3.6 Stone scatters, areas of soil discolouration and outcrops of natural substrata will be recorded and plotted by stint.
- 3.7 Pro-forma sheets will be used to record details of walker, soil/crop conditions, slope/topography, and lighting/weather conditions for each transect and presence/absence of finds for each collection unit.
- 3.8 Finds will be washed and sorted into groups in order to facilitate identification. Finds will be bagged according to artefact class within each collection unit.
- 3.9 Finds will be identified, quantified and recorded directly on to computer. The results will be plotted using a CAD graphics programme.
- 3.10 All significant artefact distributions will be plotted by field, group of fields or appropriate length for a linear scheme, at 1:2500, with separate plans for each period or relevant subdivision, indicating the numbers of artefacts per stint.
- 3.11 The pottery and other relevant artefacts will be scanned to assess the date range of the assemblage.
- 3.12 All finds and samples will be treated in a proper manner and to standards agreed in advance with the recipient museum or other body. These will be cleaned, conserved, bagged and boxed in accordance with the guidelines set out in UKIC's "*Conservation Guidelines No 2*".

APPENDIX 4

Earthwork surveys

- 4.1 Base points will be established using a Total Station.
- 4.2 Hachured plans will normally be prepared at 1:1250 or 1:2500 for most classes of earthwork. In certain cases more detailed survey by contouring will be carried out.
- 4.3 Appropriately experienced personnel will undertake the survey work.

- 4.4 All prepared plans will be presented with an accompanying descriptive text.

APPENDIX 5

Walkover Survey

- 5.1 The proposed study area will be walked over in a systematic manner. Approximately 30m wide transects will be used, although this can be reduced where conditions demand.
- 5.2 All features identified (including modern features) will be given a unique number. The location of each feature will be marked on a 1:10,000 map. A photographic and written record will be compiled.

APPENDIX 6

Test pits

- 6.1 Spacing and size of test pits will vary according to local topography, geology, and known or potential archaeology. Spacing and size will be as specified in the Written Scheme of Investigation.
- 6.2 Test pits will be laid out in relation to the Ordnance Survey national grid.
- 6.3 The most appropriate tools will be used taking into account the prevailing conditions at the time of the work.
- 6.4 A specified volume of topsoil from each test pit will be sieved through a 10mm mesh.
- 6.5 Conditions, contexts and artefact totals will be recorded on pro-forma sheets.
- 6.6 Subdivisions within the excavated material will be based on soil stratigraphy and spits of 100mm within each stratigraphical unit.
- 6.7 All artefact totals will be recorded by class.
- 6.8 Finds will be washed and sorted into groups in order to facilitate identification. Finds will be bagged according to artefact class within each collection unit.
- 6.9 Finds will be identified, quantified and recorded directly onto computer where appropriate. The results will be plotted using a CAD graphics programme when appropriate.
- 6.10 All significant artefact distributions will be plotted by field, group of fields or appropriate length for a linear scheme at 1:2500, with separate plans for each period or relevant subdivision, indicating the numbers of artefacts per test pit.
- 6.11 The pottery and other relevant artefacts will be scanned to assess the date range of the assemblage.
- 6.12 All finds and samples will be treated in a proper manner and to standards agreed in advance with the recipient museum or other body. These will be cleaned, conserved, bagged and boxed in accordance with the guidelines set out in UKIC's "*Conservation Guidelines No 2*".

APPENDIX 7

Machine excavated trenches

Excavation

- 7.1 The entire site will be visually inspected before the commencement of any machine excavation. This will include the examination of any available exposures (e.g. recently cut ditches and geo-technical test pits).
- 7.2 Normally trench positions will be accurately surveyed prior to excavation and related to the National Grid. It may be necessary to survey the positions after excavation in some instances.
- 7.3 All machining will be carried out by plant of an appropriate size. Normally, this will be a JCB 3CX (or similar) or 360^o tracked excavator with a 1.4 or 1.8m wide toothless bucket. Where access or working space is restricted a mini excavator such as a Kubota KH 90 will be used.
- 7.4 All machining will be carried out under direct control of an experienced archaeologist.
- 7.5 Undifferentiated topsoil or overburden of recent origin will be removed in successive level spits (approximately <0.5m) down to the first significant archaeological horizon.
- 7.6 Excavated material will be examined in order to retrieve artefacts to assist in the analysis of the spatial distribution of artefacts.
- 7.7 On completion of machine excavation, all faces of the trench that require examination or recording will be cleaned using appropriate hand tools.
- 7.8 All investigation of archaeological horizons will be by hand, with cleaning, inspection, and recording both in plan and section.
- 7.9 Within each significant archaeological horizon a minimum number of features required to meet the aims of the project will be hand excavated. Pits and postholes normally will be sampled by half-sectioning although some features may require complete excavation. Linear features will be sectioned as appropriate. Features not suited to excavation within the confines of narrow trenches will not be sampled. No deposits will be entirely removed unless this is unavoidable. As the objective is to define remains it will not necessarily be the intention to fully excavated all trenches to natural stratigraphy. However, the full depth of archaeological deposits across the entire site will be assessed. Even in the case where no remains have been located the stratigraphy of all evaluation trenches will be recorded.
- 7.10 Any excavation, whether by machine or by hand, will be undertaken with a view to avoiding damage to any archaeological features or deposits which appear to be demonstrably worthy of preservation *in situ*.
- 7.11 For palaeoenvironmental research different sampling strategies will be employed according to established research targets and the perceived importance of the strata under investigation. AOC Archaeology conventionally recovers three main categories of sample.
 - i)* Routine Soil Samples; a representative 500g sample from every excavated soil context on site. This sample is used in the characterisation of the sediment, potentially through pollen analysis, particle size analysis, pH analysis, phosphate analysis and loss-on-ignition;
 - ii)* Standard Bulk Samples; a representative 20 litre sample from every excavated soil context on site. This sample is used, through floatation sieving, to recover a sub-sample of charred macroplant material, faunal remains and artefacts;

iii) Purposive or Special Samples; a sample from a sediment which is determined, in field, to either have the potential for dating (wood charcoal for radiocarbon dating or *in situ* hearths for magnetic susceptibility dating) or for the recovery of enhanced palaeoenvironmental information (waterlogged sediments, peat columns, etc).

- 7.12 Any finds of human remains will be left *in situ*, covered and protected. In Scotland the local police will be informed. If removal is essential this will only take place with police approval, and in compliance with Historic Scotland's Operational Policy Paper '*The Treatment of Human Remains in Archaeology*'. In England and Wales the coroner's office will be informed. If removal is essential, it will only take place under the relevant Home Office licence and local authority environmental health regulations.
- 7.13 All finds of gold and silver will be moved to a safe place. Where removal cannot be effected on the same working day as the discovery, suitable security measures will be taken to protect the artefacts from theft or damage. In Scotland the recovery of such material, along with all other finds, will be reported to the Queen's and Lord Treasurer's Remembrancer. In England and Wales the recovery of such material will be reported to the coroner's office according to the procedures relating to Treasure Trove.
- 7.14 After recording, the trenches will be backfilled with excavated material.

Recording

- 7.15 For each trench, a block of numbers in a continuous sequence will be allocated.
- 7.16 Written descriptions, comprising both factual data and interpretative elements, will be recorded on standardised sheets.
- 7.17 Where stratified deposits are encountered a 'Harris'-type matrix will be compiled during the course of the excavation.
- 7.18 The site grid will be accurately tied into the National Grid and located on the 1:2500 or 1:1250 map of the area.
- 7.19 Plans will normally be drawn at a scale of 1:100, but on urban or deeply stratified sites a scale of 1:50 or 1:20 will be used. Burials will be drawn at 1:10. Other detailed plans will be drawn at an appropriate scale.
- 7.20 Long sections of trenches showing layers and any cut features will be drawn at 1:50. Sections of features or short lengths of trenches will be drawn at 1:20.
- 7.21 Generally all sections will be accurately related to Ordnance Datum. There may, occasionally, be instances where this is unnecessary when it will be agreed with the local authority's archaeological representative in advance.
- 7.22 Registers of sections and plans will be kept.
- 7.23 A full colour print and colour transparency photographic record will be maintained. This will illustrate the principal features and finds both in detail and in a general context. The photographic record will also include working shots to represent more generally the nature of the fieldwork.
- 7.24 A register of all photographs taken will be kept on standardised forms.
- 7.25 All recording will be in accordance with the standards and requirements of the *Archaeological Field Manual* (Museum of London Archaeology Service 3rd edition 1994).

Finds

- 7.26 All identified finds and artefacts will be collected and retained. Certain classes of material, i.e. post-medieval pottery and building material, may on occasion be discarded after recording if a representative sample is kept. No finds will be discarded without the prior approval of the archaeological representative of the local authority and the receiving museum.
- 7.27 Finds will be scanned to assess the date range of the assemblage with particular reference to pottery. In addition the artefacts will be used to characterise the site, and to establish the potential for all categories of finds should further archaeological work be necessary.
- 7.28 All finds and samples will be treated in a proper manner and to standards agreed in advance with the recipient museum. Finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the guidelines set out in United Kingdom Institute for Conservation's *Conservation Guidelines No. 2*.
- 7.29 In England and Wales, at the beginning of the project (prior to commencement of fieldwork) the landowner and the relevant museum will be contacted regarding the preparation, ownership and deposition of the archive and finds. In Scotland all archaeological material recovered belongs to the Crown and its disposal is administered by the Queen's and Lord Treasurer's Remembrancer.

APPENDIX 8

Evaluation reports

- 8.1 The style and format of the evaluation report will be determined by AOC Archaeology, but will be compliant with Historic Scotland's issued guidance on Data Structure Reports. The report will include as a minimum the following;
- i) A location plan of the site.
 - ii) A location plan of the trenches and/or other type of fieldwork strategy employed.
 - iii) Plans and sections of features and/or extent of archaeology located. These will be at an appropriate scale.
 - iv) A summary statement of the results.
 - v) A table summarising per trench the deposits, features, classes and numbers of artefacts encountered and spot dating of significant finds.
 - vi) Consideration to the methodology will be given along with a confidence rating for the results.
- 8.2 When an evaluation is followed by an excavation the procedures defined in English Heritage's *Management of Archaeological Projects* 2nd edition 1991 will be followed for immediate post-field archive preparation and initial assessment. It will then be agreed with the local authority's archaeological advisor which aspects will need to be taken forward to the report stage.

APPENDIX 9

Area excavation

- 9.1 Prior to the stripping of any area excavation, all appropriate surveys (e.g. geophysical, earthwork, contour) or sampling strategies (e.g. for topsoil artefact densities, metal detecting, phosphate analysis) will be undertaken.
- 9.2 In most cases sites will be mechanically stripped of topsoil and other overburden. An appropriate machine will always be used. This will normally be a 360° tracked excavator with a between 1.4 and 2.4m wide toothless bucket. In other cases a JCB 3CX (or similar), or for work with restricted access or working room a mini-excavator such as a Kubota KH 90 will be used. Suitably sized dumpers or lorries will be employed to remove spoil. No plant will be allowed to cross stripped areas.
- 9.3 All machining will be undertaken under the direct control of experienced archaeologists.
- 9.4 All undifferentiated topsoil or overburden will be removed down to the first significant archaeological horizon in level spits. The archaeological horizon to which the material will be cleared will have first been established by an evaluation or by the digging of test pits.
- 9.5 Depending on the aims of the project, the excavated spoil may be monitored in order to recover artefacts. Where their findspots are plotted this will usually be on a 2m grid.
- 9.6 The surface exposed by the stripping will be cleaned using appropriate hand tools.
- 9.7 Should the site grid not have already been established it will be done at the cleaning stage. The grid will normally be based on a 10m spacing and related to the National Grid. A temporary benchmark related to Ordnance Datum will be founded
- 9.8 After the cleaning and planning of the excavation area the sampling strategy will be finalised. This will take into account the project aims (which may need modifying at this stage) and the type, quality and quantity of remains revealed. The sampling strategy will normally seek to maintain at least the following levels;
- i)* all structures and all zones of specialised activity (e.g. funerary, ceremonial, industrial, agricultural processing) will be fully excavated and all relationships recorded;
 - ii)* ditches and gullies will have all relationships defined, investigated and recorded. All terminals will be excavated. Sufficient lengths of the feature will be excavated to determine the character of the feature over its entire course; the possibility of re-cuts of parts of the feature, and not the whole, will be considered. This will be achieved by a minimum 10% sample of each feature (usually a 1m section every 10m).
 - iii)* Sufficient artefact assemblages will be recovered (where possible) to assist in dating the stratigraphic sequence and for obtaining ample ceramic groups for comparison with other sites;
 - iv)* all pits, as a minimum, will be half-sectioned. Usually at least 50% (by number) of the pits will be fully excavated. Decisions as to which pits will be fully excavated will be taken in the light of information gained in the half-sectioning taking into consideration, amongst other things; pit function, artefact content and location;
 - v)* for post and stake holes where they are clearly not forming part of a structure (see above) 100% (by number) will be half-sectioned ensuring that all relationships are

investigated. Where deemed necessary, by artefact content, a number may demand full excavation;

- vi) for other types of feature such as working hollows, quarry pits, etc the basic requirement will be that all relationships are ascertained. Further investigation will be a matter of on-site judgement, but will seek to establish as a minimum their extent, date and function;
- vii) for layers, an on-site decision will be made as to the limits of their excavation. The factors governing the judgement will include the possibility that they mask earlier remains, the need to understand function and depositional processes, and the necessity to recover sufficient artefacts to date the deposit and to meet the project aims.

9.9.1 For palaeoenvironmental research different sampling strategies will be employed according to established research targets and the perceived importance of the strata under investigation. AOC Archaeology conventionally recovers three main categories of sample;

- i) Routine Soil Samples; a representative 500g sample from every excavated soil context on site. This sample is used in the characterisation of the sediment, potentially through pollen analysis, particle size analysis, pH analysis, phosphate analysis and loss-on-ignition;
- ii) Standard Bulk Samples; a representative 10 litre sample from every excavated soil context on site. This sample is used, through floatation sieving, to recover a sub-sample of charred macroplant material, faunal remains and artefacts;
- ii) Purposive or Special Samples; a sample from a sediment which is determined, in field, to either have the potential for dating (wood charcoal for radiocarbon dating or *in situ* hearths for magnetic susceptibility dating) or for the recovery of enhanced palaeoenvironmental information (waterlogged sediments, peat columns, etc).

9.10 Any finds of human remains will be left *in situ*, covered and protected. In Scotland the local police will be informed. If removal is essential this will only take place with police approval, and in compliance with Historic Scotland's Operational Policy Paper '*The Treatment of Human Remains in Archaeology*'. In England and Wales the coroner's office will be informed. If removal is essential it will only take place under the relevant Home Office licence and local authority environmental health regulations.

9.11 All finds of gold and silver will be moved to a safe place. Where removal cannot be effected on the same working day as the discovery, suitable security measures will be taken to protect the artefacts from theft or damage. In Scotland the recovery of such material, along with all other finds, will be reported to the Queen's and Lord Treasurer's Remembrancer. In England and Wales the recovery of such material will be reported to the coroner's office according to the procedures relating to Treasure Trove.

Recording

9.12 All on-site recording will be undertaken in accordance with the standards and requirements of the *Archaeological Site Manual* (Museum of London 1994).

9.13 A continuous unique numbering system will be employed.

- 9.14 Written descriptions, comprising both factual data and interpretative elements, will be recorded on standardised sheets.
- 9.15 Where stratified deposits are encountered a 'Harris'-type matrix will be compiled during the course of the excavation.
- 9.16 The site grid will be accurately tied into the National Grid and located on the 1:2500 or 1:1250 map of the area.
- 9.17 Plans will normally be drawn at a scale of 1:100, but on urban or deeply stratified sites a scale of 1:50 or 1:20 will be used. Burials will be drawn at 1:10. Other detailed plans will be drawn at an appropriate scale.
- 9.18 Long sections of trench edges or internal baulks showing layers and any cut features will be drawn at 1:50 or 1:20 depending on amount of detail contained. Sections of features will be drawn at 1:20.
- 9.19 All sections will be accurately related to Ordnance Datum.
- 9.20 Registers of sections and plans will be kept.
- 9.21 A full colour print and colour transparency photographic record will be maintained. This will illustrate the principal features and finds both in detail and in a general context. The photographic record will also include working shots to represent more generally the nature of the fieldwork.
- 9.22 A register of all photographs taken will be kept on standardised forms.

Finds

- 9.23 All identified finds and artefacts will be collected and retained. Certain classes of material, i.e. post-medieval pottery and building material may on occasion be discarded after recording if a representative sample is kept. No finds will be discarded without the prior approval of the archaeological representative of the local authority and the receiving museum.
- 9.24 All finds and samples will be treated in a proper manner and to standards agreed in advance with the recipient museum. Finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the guidelines set out in United Kingdom Institute for Conservation's *Conservation Guidelines No. 2*.
- 9.25 In England and Wales, at the beginning of the project (prior to commencement of fieldwork) the landowner and the relevant museum will be contacted regarding the preparation, ownership and deposition of the archive and finds. In Scotland all archaeological material recovered belongs to the Crown and its disposal is administered by the Queen's and Lord Treasurer's Remembrancer.

Archiving, post-excavation and publication

- 9.26 Following completion of each stage or the full extent of the fieldwork (as appropriate) the site archive will be prepared in the format agreed with the receiving institution.
- 9.27 On completion of the archive a summary report will be prepared. This will include;
 - i) an illustrated summary of the results to-date indicating to what extent the project aims were fulfilled;
 - ii) a summary of the quantities and potential for analysis of the information recovered for each category of site, artefact, dating and palaeoenvironmental data;

iii) proposals for analysis and publication.

9.28 The proposals for analysis and publication will include;

- i) a list of the revised project aims arising from the fieldwork and post-excavation assessment;
- ii) a method statement which will make clear how the methods advocated are those best suited to ensuring that the data-collection will fulfil the stated aims of the project;
- iii) a list of all tasks involved in meeting the stated methods to achieve the aims and produce a report and research archive in the stated format;
- iv) details of the research team and their projected work programmes in relation to the tasks. Allowance will be made for general project-related tasks such as project meetings, management, editorial and revision time;
- v) a publication synopsis indicating publisher, report format and content shown by chapters, section and subheadings with the anticipated length of text sections and proposed number of illustrations.

9.29 The summary report embracing the analysis and publication proposals will be submitted to the client and the local authority's archaeological representative for approval.

9.30 Any significant variation in the project design, including timetables, proposed after the agreement of the proposals must be acceptable to the local authority's archaeological representative.

9.31 The results of the project will be published in an appropriate archaeological journal or monograph. The suitable level of publication will be dependent on the significance of the project results, but as a minimum the basic requirements of Appendix 7.1 of *Management of Archaeological Projects* (English Heritage 1991) will be met.

APPENDIX 10

Standing Building Assessment

- 10.1 A standing building assessment will normally take place in concordance with a Conservation Plan, but may also form part of a Desk-Based Assessment if required.
- 10.2 A visual inspection will be made of both the interior and exterior of the building(s) with a view to establishing the extent of the architecturally important elements that should be included in a later phase of historic building recording work.
- 10.3 A brief written record will be made in addition to digital photography of areas of interest to support recommendations and outline architectural features within the building(s).

APPENDIX 11

Historic Building Recording: The Written Record (Levels 0-6)

- 11.1 Pro forma building recording sheets will be used for the basic written record of the building(s) including comments on the condition, construction techniques, materials, fixtures and fittings

and interpretation of function. A competent analysis will be made of all building phases and any relationship between buildings. Day Book records will also be kept for any levels of recording above Level 1.

- 11.2 At Level 4, the written record will encompass a thorough context description of each broad phase of construction and alteration with a view to formulating a stratigraphic matrix of the site.

APPENDIX 12

Historic Building Recording: Photography (Levels 1-5)

- 12.1 Photography will take place at all levels of building recording, and will be undertaken with a single lens reflex camera with through-the-lens (TTL) light metering. A standard 28-90mm lens will be used at all times except where wider or shorter angle lenses are required for longer elevation photography and detailed photography.
- 12.2 The camera will be placed at mid-height to the subject with due care and attention to lighting situations. Two shots will be taken of each feature, undertaken by a light-meter reading of a two-step change in aperture. This change up or down will depend on light conditions.
- 12.3 Interior photography will be undertaken with appropriate lighting conditions and the use of a tripod. Where light access is still quite minimal, an automatic flash will be used.
- 12.4 All photography will be taken on colour slide and black & white negative film, such as Kodak PLUS-X or Ilford FP4, or approved equivalent. It should be exposed and processed to an archival standard, i.e., fix and wash in accordance with the manufacturer's specifications.
- 12.5 The use of a digital camera may be used as a reference to survey and drawn elevations and ground plans on-site.

APPENDIX 13

Historic Building Recording: Rectified Photography and Photogrammetry (Level 3)

- 13.1 An external contractor will carry out rectified photography and photogrammetry in compliance with the following guidelines:
- i)* All photography will be carried out with an approved type of camera. Details of the camera used may be supplied on completion of the project.
 - ii)* The smallest permissible photographic negative scale will normally be defined as follows: for 1:50 scale plotting, negative scale should be no more than 1:200 and for 1:20 scale plotting, negative scale should be no more than 1:200.
 - iii)* All rectified photography will be taken on black & white negative film, such as Kodak PLUS-X or Ilford FP4, or approved equivalent. It should be exposed and processed to an archival standard, i.e., fix and wash in accordance with the manufacturers specifications.

APPENDIX 14

Historic Building Recording: Elevation Recording (Level 2)

- 14.1 All elevations drawn or surveyed will be a 'preservation by record' of the current state of the building. The following categories will be recorded:
- i)* All architectural features with associated decorative detail including windows, doors, quoin stones, string courses, roof lines and other structural stonework and jointing.
 - ii)* Fixtures and fittings such as drainpipes and guttering, signs, brackets and vents.
 - iii)* Later modifications and/or damage to the building such as structural cracks, areas of erosion, patches of rendering, blocked doorways, windows and other openings.
- 14.2 Large or small repetitive features such as windows, capitals, mouldings, etc. sampling will be undertaken as appropriate.
- 14.3 Where the façade is of stone construction each individual stone may be recorded. However, in most instances, a representative area, usually 1m², will be sufficient, although windows, corner stones and other architectural details will always be fully recorded. The degree of recording for ashlar will be depend upon the scale with which the elevation is to be produced and will be determined in advance of the start of works. When drawings are carried out at 1:50, a single line between the joints of the stone will normally be considered satisfactory. However, if there is a considerable gap between the stones, both sides of the stone will be shown. At a scale of 1:20 or larger, then all joints will normally be shown except where the stone is very fine ashlar.
- 14.4 Elevation recording by hand will normally take place if it is inappropriate to do so by survey. The size and complexity of an elevation will determine what on-site scale will be required. In general, a scale of 1:50 will be deemed appropriate with a larger scale adopted if portions of this elevation are more complex. For highly detailed architectural detail a scale of 1:1 may be appropriate.
- 14.5 All hand-drawn measured elevations and detail will be drawn using water-resistant paper with a hard 4H – 6H pencil. A levelled datum line will be taken through the centre of the elevation with offset measurements. All datum points will be accurately positioned within the site either by hand or by survey.

APPENDIX 15

Historic Building Recording: Elevation Recording – By Survey (Levels 2-4)

- 15.1 Where appropriate, elevations may be recorded by radiation survey using a reflectorless EDM (REDM) Leica TCR 705. This method of survey allows the accurate capture of data of upper floor levels. If more than one elevation is to be recorded, then a traverse will be created around each building or group of buildings. Extra stations may be set up in places where there is limited access. Values in the traverse will be adjusted by Bowditch adjustment to

compensate for any errors in measurement. The adjusted values will then be calculated using LisCAD Plus v5.0 (Surveying and Engineering Module). Co-ordinates will be located by resection from existing traverse points. The survey data will be downloaded to a laptop computer on-site via Leica Office software. All measurements taken by survey will consist of three-dimensional co-ordinates relating to the Ordnance Survey National Grid.

- 15.2 The recording of an elevation will not be carried out by survey equipment if:
- i) There are too many obstructions;
 - ii) The surface of the building is too dark or mossy;
 - iii) There is too much curved architectural detail;
 - iv) The distance required to set up the survey equipment in front of the elevation is too large (i.e., more than 25m) or too short to capture data from the upper levels of the elevation.
- 15.3 Where appropriate, elevations carried out by survey will be supplemented by detail measured by hand.

APPENDIX 16

Historic Building Recording: Interior Recording (Levels 2-4)

- 16.1 The recording of the interior(s) of the building(s) will consist of a written record and, where appropriate, measured sketch plans of the ground plan and the roof elevations based on the following guidelines:
- i) Critical analysis of the interior condition, construction, materials, fixtures and fittings will be made using *pro forma* recording sheets.
 - ii) Measured interior ground plans of each room of the interior will be carried out using tapes and a Leica Disto™ Classic electronic distance measurer.
 - iii) All measured plans will contain: notes on the size of structural members, and finishes; floor levels, change in levels, and ceiling heights; direction of stair rises in plan with each riser numbered; the positions of service entry points, plant and machinery and sanitary fittings; below-ground drainage; soil and vent stacks and rainwater pipes where appropriate.

APPENDIX 17

Historic Building Recording: Standard Report Illustrations (Level 6)

- 17.1 All final illustrations for archive will be produced digitally on the Computer-Aided Drawing package, AutoCAD 2000i/2000LT and/or Adobe Illustrator v9/v10. A standard methodology will be used with all drawings adhering to the following guidelines:
- 17.2 Line Weight. The appropriate line weight will depend on anticipated plot scale and may need editing if the output scale is to change. The degree of detail used will affect the line weight utilised in the finished drawing. All fine architectural detail (stonework, moulded stonework, brickwork, etc.) will be produced at a line weight of 0.05mm. More general architectural features (outlines of doors and windows, etc.) will be produced at a line weight of 0.09mm. A much heavier line will indicate the changing of plane in complex elevations.

- 17.3 Text. Text will be made clear and informative, with orientation, position, size and letter spacing remaining appropriate to the layout of the plotted sheets.
- 17.4 Scale. No archaeological or historic building survey will be carried out without a particular scale or range of scales in mind.
- 17.5 Layers. The layering system in Computer Aided Drawing packages allow the separation of data into specified criteria. To achieve this, there is an AOC standard layering system. This system is largely based on the coding system inherent in the use of the reflectorless EDM Leica TCR705.
- 17.6 Digital Archiving. All drawings are produced at a 1:1 scale for easy scaling in .dxf or .dwg format. At the end of a project, all data is stored on CD-ROM.

APPENDIX 18

Historic Building Recording: Dendrochronological Analysis (Level 3)

- 18.1 Dendrochronological analysis of timbers from standing building is primarily undertaken to provide accurate dates for its construction. Where appropriate, samples may be taken for analysis to provide information on the source and quality of the timber, thus informing on the social and economic context of the building.
- 18.2 Samples for analysis will take place under the following conditions:
- i) That the timber sample taken is from a species where date chronologies already exist, namely oak and pine.
 - ii) A minimum of eight timbers per phase or building are required to cross-match results.
 - iii) The ring patterns inherent in a timber sample must be over a certain length, usually seventy rings.
- 18.3 The method of the removal of samples of timber will be to use a corer attached to a power-driven drill, removing a core leaving a hole in the timber 10mm in diameter. The core will be taken so that a maximum radius from pith to bark is taken, thus ensuring the maximum numbers of growth rings for analysis. Timbers will be selected which have retained a full ring sequence as possible (i.e., those where the outermost rings have not been trimmed off or destroyed by woodworm).
- 18.4 Where it is impossible to use this intrusive method of sample, for example, in the case of painted ceilings and carved panels, the ring sequence can be measured *in situ* using a hand lens. Silicone rubber casts can also be taken where the end grain is exposed.

APPENDIX 19

Historic Building Recording: Paint and Wallpaper Analysis (Level 3)

- 19.1 Paint and/or wallpaper analysis will usually only take place where layers that have been applied over the years have not been removed. Where appropriate, paint analysis can take place by

methods of scraped samples or thin section analysis. Cross-sections may also be obtained from samples of paint to reveal a stratigraphy of paint layers.

APPENDIX 20

Historic Building Recording: Reporting (Levels 0-6)

20.1 The style and format of the final report on historic building recording works will be determined by AOC Archaeology, but will be compliant with Historic Scotland's issued guidance on Data Structure Reports. The content of this report will depend greatly in the level of works that have taken place but at minimum will include:

- i) A location plan of the site showing the areas under investigation numbered and cross-referenced in the text;
- ii) A summary statement of the results;
- iii) An introduction, methodology and results of the works;
- iv) Photographic plates to illustrate the text.

20.2 Where a programme of historic building recording has taken place at Level 2 or above, the Data Structure Report will contain a number of illustrations, the format of which is outlined in more detail in Appendix 17.

APPENDIX 21

Watching Briefs

21.1 Where the archaeologist (Watching Brief Officer) has no remit over the working methodology of the site (specification of machine or depth of excavation). The Watching Brief Officer will simply observe the works and record their nature and form. Where the Watching Brief Officer specifies the site methodology, i.e. type of machine and depth of excavation. AOC Archaeology's preferred approach is to consider the Watching Brief Area as a large evaluation trench and follows in general, Appendix 7.

21.1 It is important to stress that the client determines the area affected and unless instructed by a curator the Watching Brief Officer has no power to extend the area unless it is to fully excavate a human body that otherwise would have been truncated by the works.

21.2 In addition to the general principles outlines in Appendix 7 the following approaches will be undertaken:

21.3

- i) a record will be made of all site attendances;
- ii) in general a written and photographic record will be kept of the excavated sediments;
- iii) where archaeological features are identified and they can be dealt with in less than two hours this work will be undertaken by the Watching Brief Officer. Recording and excavation protocols will follow Appendices 7.9 –7.11;

- iv) where archaeological remains requiring more than two hours of excavation and recording, the Watching Brief Officer will stop the works and both the curator and the client will be contacted to devise a mitigation strategy. All delays will be kept to a minimum. Any resultant excavation and recording work will be in keeping with the methods outlined in Appendix 9;
- v) the extent of the watching brief area will not be recorded unless specifically required by either the client or the curator. Where such recording is required the area will be accurately recorded by total station and linked into the Ordnance Datum;
- vi) Reporting of Watching Briefs will follow methods specified in Appendix 8.

APPENDIX 22

General

22.1 The requirements of the Brief will be met in full where reasonably practicable .

22.2 Any significant variations to the proposed methodology will be discussed and agreed with the local authority's archaeological representative in advance of implementation.

22.3 The scope of fieldwork detailed in the main part of the Written Scheme of Investigation is aimed at meeting the aims of the project in a cost-effective manner. AOC Archaeology Group attempts to foresee all possible site-specific problems and make allowances for these. However there may on occasions be unusual circumstances which have not been included in the programme and costing. These can include;

- i) unavoidable delays due to extreme weather, vandalism, etc;
- ii) trenches requiring shoring or stepping, ground contamination, unknown services, poor ground conditions;
- iii) extensions to specified trenches or feature excavation sample sizes requested by the local authority's archaeological advisor;
- iv) complex structures or objects, including those in waterlogged conditions, requiring specialist removal.

Health and Safety

22.4 All relevant health and safety legislation, regulations and codes of practice will be respected.

22.5 With the introduction of the Construction, Design and Management Regulations 1994, AOC Archaeology works with Clients, Main Contractors, and Planning Supervisors to create a Health and Safety Plan. Where CDM regulations apply, each project will have its own unique plan.

Insurances

22.6 AOC Archaeology holds Employers Liability Insurance, Public Liability Insurance and Professional Indemnity Insurance. Details can be supplied on request.

22.7 AOC Archaeology will not be liable to indemnify the client against any compensation or damages for or with respect to;

- i) damage to crops being on the Area or Areas of Work (save in so far as possession has not been given to the Archaeological Contractor);
- ii) the use or occupation of land (which has been provided by the Client) by the Project or for the purposes of completing the Project (including consequent loss of crops) or interference whether temporary or permanent with any right of way light air or other easement or quasi easement which are the unavoidable result of the Project in accordance with the Agreement;
- iii) any other damage which is the unavoidable result of the Project in accordance with the Agreement;
- iv) injuries or damage to persons or property resulting from any act or neglect or breach of statutory duty done or committed by the client or his agents servants or their contractors (not being employed by AOC Archaeology) or for or in respect of any claims demands proceedings damages costs charges and expenses in respect thereof or in relation thereto.

22.8 Where excavation has taken place evaluation trenches will be backfilled with excavated material but will otherwise not be reinstated unless other arrangements have previously been agreed. Open area excavations normally will not be backfilled but left in a secure manner unless otherwise agreed.

Copyright and confidentiality

22.9 AOC Archaeology will retain full copyright of any commissioned reports, tender documents or other project documents under the Copyright, Designs and Patents Act 1988 with all rights reserved; excepting that it will provide an exclusive licence to the Client in all matters directly relating to the project as described in the Written Scheme of Investigation.

22.10 AOC Archaeology will assign copyright to the client upon written request but retains the right to be identified as the author of all project documentation and reports as defined in the Copyright, Designs and Patents Act 1988.

22.11 AOC Archaeology will advise the Client of any such materials supplied in the course of projects which are not AOC Archaeology's copyright.

22.12 AOC Archaeology undertake to respect all requirements for confidentiality about the Client's proposals provided that these are clearly stated. In addition AOC Archaeology further undertakes to keep confidential any conclusions about the likely implications of such proposals for the historic environment. It is expected that Clients respect AOC Archaeology's and the Institute of Field Archaeologists' general ethical obligations not to suppress significant archaeological data for an unreasonable period.

Standards

22.13 AOC Archaeology conforms to the standards of professional conduct outlined in the Institute of Field Archaeologists' Code of Conduct, the IFA Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology, the IFA Standards and Guidance for Desk Based Assessments, Field Evaluations etc., and the British Archaeologists and Developers Liaison Group Code of Practice.

22.14 Project Directors normally will be recognised in an appropriate Area of Competence by the Institute of Field Archaeologists.

22.15 Where practicable AOC Archaeology will liaise with local archaeological bodies (both professional and amateur) in order that information about particular sites is disseminated both ways (subject to client confidentiality).

APPENDIX 23

Specialist staff

The following specialist staff may be used on this project depending on the type of artefacts and soil samples recovered during the course of the fieldwork.

AOC Archaeology Staff:

| | |
|-------------------------|--|
| Dr. Anne Crone | Dendrochronology, charcoal and timber analysis |
| Dr. Ciara Clarke | Pollen analysis |
| Dr. Dawn McLaren | Ceramics and coarse stone |
| Mr. Rob Engl | Lithics |
| Ms. Melissa Melikian | Human bone |
| Ms. Jackaline Robertson | Soils and sediments analysis charcoal identification |
| Mr. George Haggarty | Medieval and post-medieval pottery |
| Ms. Gretel Evans | Conservation |

APPENDIX 24

Post-excavation

24.1 Sample Flotation

Sample flotation is a water recovery technique designed to separate organic remains from the soil matrix. A Siraf style system of flotation and wet-sieving will be operated by the archaeological contractor. This system comprises an enclosed area of water into which the soil samples are deposited and agitated. Due to the difference in densities of organic and inorganic remains the light fractions will float, the heavy fractions will sink and the silt fraction will be washed away. The resulting floating material (flot) is collected in sieves of 0.3 mm and 1 mm, the non-floating residue (retent) is wet-sieved through a 1 mm mesh.

All flots and retents are air dried, bagged and labelled accordingly. Throughout this process all equipment is kept clean to prevent contamination of the samples. For each sample, a Sieving Assessment sheet is completed. This gives basic information about the sample, retent and flot. Prior to flotation and wet-sieving, the volume of each sample is measured by means of a graduated bucket.

If in a sample a high concentration of clay can be observed and therefore separation of the different fractions of the soil is difficult, an aqueous solution of defloculant 'Calgon' is added and the sample is left to soak overnight, before processing by flotation and wet-sieving.

Sample flotation will be carried out on site and/or at the premises of the archaeological contractor.

24.2 Sample Wet sieving

Sample wet sieving, also a water recovery technique, is carried out in laboratory conditions and is designed to recover waterlogged material. For the recovery of waterlogged botanical material, small soil samples (0.5 to 1.0 litre) are processed through a 0.3 mm sieve. The sediment is placed in a bucket with water and agitated before being washed through the 0.3 mm sieve. This process is repeated until the sample is totally disaggregated. The resulting material is stored in water or ethanol depending on the length of the storage period. Sample wet sieving can also be used to recover larger waterlogged material such as leather and wood in which case larger volumes of soil are processed.

24.3 Sample Dry sieving

Sample dry sieving is carried out to retrieve smaller artefacts that might be missed during normal excavation procedure, e.g.. small sherds of pottery and bone. Done in laboratory conditions, all samples are air dried in the first instance. Done in the field, the samples are processed with the sample in a field-moist state. In both cases the sample is passed through a 4 mm mesh and any items of interest are recovered and recorded.

24.4 Residue sorting

All residue (retent) sorting is carried out in laboratory conditions, and is designed to recover not only material that might be missed during normal excavation procedure (see dry sample sieving), but also material that would be impossible to recover during normal excavation procedure e.g.. charred and uncharred plant remains, insect remains and small fragments of charcoal.

The volume of the residue is recorded and then passed through a set of sieves (mesh sizes 8 mm, 4 mm, 2 mm and 1 mm). Each fraction is spread out onto a separate tray, is scanned with the naked eye and all items of interest are recovered. Under normal circumstances all identifiable material from all fractions is recovered. The only exception to this is burnt wood (charcoal) which is only retrieved from the > 4 mm fractions. All material recovered is bagged individually by material type and the material types and weights recorded on the Retent Sorting Sheet. Also recorded on this sheet are the project number, context number, area, sample number, the sorters initials, date, sample volume, retent volume and percent of the retent sorted. Under normal circumstances 100 % of all fractions are sorted. In those instances where this is not the case, this will be recorded. Where no material is recovered from a retent, the Retent Sorting Sheet will be filled out as usual, with the word sterile written across it.

24.5 Flot sorting

All flot sorting is carried out in laboratory conditions. The volume of each flot is measured. The flots are sorted by means of a low powered binocular microscope. The macro plant remains and

other archaeological or ecological material are extracted from the flots and put into gelatine capsules or glass tubes. An estimate of the number of items recovered and the species represented are recorded. The charcoal larger than 4mm is extracted from the flots and weighed. All extracted items are bagged and labelled accordingly.

24.6 Routine Soils Analysis

All the samples taken on-site will have a routine partner. Four standard routine soil tests will be carried out by the archaeological contractor. These are pH analysis, Loss on Ignition, Calcium Carbonate content and Easily available phosphate content.

The pH value is the measure of the acidity (H+) or alkalinity (OH+) of the sample. Dissolving a portion of the soil in distilled water, then measuring the sample using pH meter carries this out. This is to allow us to estimate the potential for preservation within the sediment.

Loss on Ignition is the measure organic content of the sample. This is measured by burning a small amount of the sediment in a furnace at 400°C for four hours. By measuring the weight before and after burning the organic content can be calculated. The organic content allows us to examine whether manuring or treatment of the natural soil has taken place.

Calcium Carbonate content can be measured by dissolving a few grains of the sample using Hydrochloric acid. If calcium carbonate is present then a small amount of Carbon Dioxide is given off, the greater the amount of CO₂ released the greater the amount of CaCO₂. The Calcium Carbonate content shows us if there is any natural calcium carbonate within the sediment, or if not, any mortar or shell has been included artificially.

The amount of phosphate within a sample is examined at the same time as CaCO₂. After the CO₂ has been released Ascorbic acid is applied, if Phosphate is present a colour change will occur. The phosphate content may show the presence of animals or to a lesser degree indicate where animals were kept.

24.7 Soil Micromorphological Analysis

Micromorphology is the study of undisturbed soils and loose sediments and other materials at a microscopic scale. A 25-30 micron thick slice of soil or sediment is mounted on glass and studied using a petrographic microscope. The samples are prepared for thin section analyses at the Department of Environmental Science, University of Stirling using the methods outlined by Murphy (1986). The samples are analysed using the descriptive terminology of Bullock *et al* (1985) and FitzPatrick (1993).

Bullock, P., Fedoroff, N., Jongerius, A., Stoops, G., Tursina, T. & Babel, U. 1985 *Handbook for soil thin section description*. Wolverhampton: Waine research Publications.

FitzPatrick, E.A. 1993. *Soil microscopy and micromorphology*. Chichester: John Wiley & Sons.

Murphy, C. P. 1986. *Thin section preparation of soils and sediments*. Berkhamsted: AB Academic Press.

24.8 Charcoal ID

Only charcoal retrieved from the 4mm sieve (see Sieving and Sorting procedures) is used for species identification, mainly because fragments below that threshold are too small to identify. If there is no charcoal larger than 4mm present then attempts will be made to identify the largest fragments present for the purpose of C14 samples.

Surfaces are prepared for identification by using a surgical blade to prise off flakes of charcoal revealing fresh surfaces on which diagnostic features can be identified. The charcoal fragment is bedded in sand for examination under a reflected-light microscope.

On average, up to 10 fragments of charcoal are identified per bulk sample. If a single species is present then identification can stop at 5 fragments. However, if a great variety of species is present, i.e. more than four, then identification should continue until the analyst is happy that a representative sample has been examined. Unusual or exotic species should be bagged and labelled separately within the bulk sample.

Other variables, such as whether the fragment is young roundwood, with sub-bark surfaces intact, whether it has come from a large piece of wood and whether it is fast or slow grown, should be noted.

Species identification is undertaken with reference to Schweingruber's (1982)

24.9 Wood ID

Waterlogged wood; Surfaces on waterlogged wood are prepared for identification by using a cut-throat razor or a double-sided razor blade to pare off thin-sections which are cell-thick and transparent so that diagnostic features can be identified. It is consequently difficult to identify fragments of waterlogged wood smaller than 10 mm². The thin-sections are temporarily mounted in water on slides for examination under a transmitted-light microscope.

Sampling for identification is carried out on the same basis as that for charcoal. Species identification is undertaken with reference to Schweingruber's (1982) *Microscopic Wood Anatomy* and the in-house reference collection of the archaeological contractor.

24.10 Non-charcoal charred plant macrofossil analysis and Waterlogged plant analysis

Analysis of the charred plant macrofossils and waterlogged plants involves identification, quantification and interpretation. Identification of the macro plant remains is done using a low power binocular microscope with x10 and x40 magnifications. The modern reference collection of the archaeological contractor and various seed atlases (Beijerinck 1947, Berggren 1969 & 1981 and Anderberg 1994) will be used to ease identification. The botanical nomenclature follows Flora Europaea (Tutin *et al* 1964-1981). A standardised counting method is used for quantification. Habitat information for the plant species will be taken from Hanf (1983).

24.11 Dendrochronological analysis

Sample size and species type; Three conditions are necessary to ensure the successful dating of a building or archaeological site. The timber must be a species for which there are already dated chronologies which in the UK usually means oak. Cross-matching is a statistical process, and therefore a number of timbers are required, usually at least 8 per building or phase. Finally,

and for the same reasons the ring-patterns must be over a certain length, usually 70 rings. With these conditions observed it can be relatively straightforward to obtain a date for a building.

On-site sampling; In situ timbers in a standing building are usually sampled using a corer, which is attached to a power-driven drill and removes a core leaving a hole in the timber 10 mm in diameter. The core must be taken so that the maximum radius from pith to bark is sampled, thus ensuring the maximum number of growth-rings for analysis. It is also important to select those timbers which have retained as full a ring sequence as possible, i.e. those where the outermost rings have not been trimmed off or destroyed by woodworm.

Coring is an intrusive method of sampling and it is occasionally impossible to use this method, as in the case of painting ceilings and carved panels. If the end-grain is exposed the ring sequence can be measured *in situ* using a hand lens. Silicone rubber casts can also be taken.

If structural timbers have been removed during the renovation of a building then slices, approximately 50 mm thick can be sampled by saw, usually a chainsaw, from a point along the timber where the maximum radius survives.

Timbers only survive below ground in waterlogged conditions. Waterlogged timbers are sampled as above, by the removal of a 50 mm slice by sawing.

Sample preparation;

Cores are mounted in angle moulding and then the surface is prepared by paring with a Stanley knife followed

by fine sanding with Wet&Dry sandpaper until the ring-pattern is clear and measurable.

Slices (dry); The surface of the slice is sanded, usually with a power sander, using progressively finer sandpaper until the ring-pattern is clear and measurable. It is often necessary to finish off the surface with W&D sandpaper.

Slices (wet); The slice is usually frozen for 24 hours and then the surface is planed flat using a Surform plane. This often achieves the necessary clarity of ring-pattern but where the wood is particularly hard it will be necessary to use a razor blade to pare the surface to achieve a clear ring-pattern.

Silicone rubber casts; These are fixed to battens of wood using silicone rubber, for ease of measurement.

Measurement and analysis; The samples are measured on a custom-made measuring table and the data logged onto the computer using DENDRO (Tyers 2000). Data graphing and statistical analysis are also carried out using the same package.

APPENDIX 25

Conservation

25.1 Conservation principles

The principles, ethical codes and techniques of conservation are under constant review by both practitioners and professional bodies. The archaeological contractor's approach to conservation will reflect current theory and practice, as recommended by the United Kingdom Institute for Conservation, the Scottish Museums Council, Resources for Museums and Galleries, the International Council on Museums and the International Institute for Conservation.

25.2 Security

The archaeological contractor will take all reasonable precautions to ensure the security of items brought in for conservation. The building will be protected by intruder detector systems; all conservation items will be kept in a secure locked store when not being worked on, and will not be left unattended. Particularly valuable items will be stored in a safe where required. A heat and smoke detection system will also be in operation 24 hours a day.

25.3 Insurance

Artefacts for conservation will not be covered by the contents insurance of the archaeological contractor. Insurance cover can be arranged for individual items and collections, but this is expensive. Clients are normally advised that the cheapest option is to extend their own insurance for these items for a fixed period. If required, the archaeological contractor could arrange additional insurance, and these costs would be passed on.

The archaeological contractor will have full professional indemnity cover for all its staff.

25.4 Health and safety

All relevant Health and Safety legislation, Regulations, Guidelines and Codes of Practice will be respected; Health and Safety plans will be compiled where Construction, Design and Management Regulations 1994 apply.

25.5 Conservators and allied specialist services

Professionalism: The conservators of the archaeological contractor will be graduates of approved conservation courses, and will have a thorough knowledge of current conservation practices in their particular specialist fields. The conservators will have been actively encouraged to broaden their skills and experience, and to obtain professional accreditation through the United Kingdom Institute for Conservation or PACR.

25.6 Specialist post-excavation analyses

Other services which the archaeological contractor will be able to offer are:

- wood identification and woodworking analysis
- tree ring dating
- pollen analysis
- building materials analysis
- metal artefacts
- metalworking and glass working debris
- materials analysis
- textile analysis
- insects
- fish and shells

- bird bones
- plant remains
- bone identification
- soils specialist/geologist
- artefact specialist
- fibre identification
- leather identification

25.7 Documentation

Conservation complements the work of other professionals by preventing the deterioration of the artefact, and by ensuring that the wider community benefits from the additional information recovered about an artefact in the course of conservation work.

Conservation reports are normally supplied as a hard copy, but can also be supplied on disc in a variety of formats, according to the client's requirements. Reports are normally printed on paper with a guaranteed life expectancy of 150 years; photographic materials are processed to professional industry standards such as Q-Lab.

25.8 Archival considerations

The archaeological contractor will endeavour to ensure that the materials used to document artefacts undergoing treatment have a reasonable life span. Paper used will have an estimated lifetime of 150 years (HMSO specification), and all photographic films will be processed to industry standards by a processing company that specialises in high quality work for professional photographers. Radiography films and chemicals will be fresh and well within their expiry dates. All labelling of boxes etc. will be carried out with archival quality inks; labels will generally be duplicated for safety's sake.

Wherever possible, the archaeological contractor will consider the archiving requirements for the site, and may consult the receiving museum or archive about their requirements; the archaeological contractor will follow guidelines proposed by the Association of Museum Archaeologists.

The archaeological contractor will abide by current guidelines on the care and disposal of artefacts and human remains, as set out in:

- The Disposal and Allocation of Finds
- Publication and Archiving of Archaeological Projects
- Treatment of Human Remains in Archaeology
- Archaeological Project Design, Implementation and Archiving

25.9 Museum of London Guidelines

Museum of London requirements for conservation, recording, documentation, packing and archiving will be applied where these are a pre-condition.

25.10 Assessment and estimating

The assessment determines the condition of the artefact and the best means to ensure its survival. Radiography (x-raying) of the object is normally carried out at an early stage, and is compulsory for iron objects, which have poor survival prospects, and for some copper alloy artefacts.

The estimate for the work normally applies for six months; it may be necessary to review it thereafter. Conservation rates are agreed by negotiation.

25.11 Recording

Text and image records (paper, digital and/or film as appropriate) will be made of all artefacts before conservation commences. Any information recovered during cleaning and conservation (e.g. associated material, residues, corrosion products, manufacturing techniques) will be carefully recorded, with samples taken where necessary. Soil removed from an artefact during the process will normally be retained and returned with the object, unless the excavator and/or client decides that it is not required. Where necessary, experts will be consulted on the nature of any material discovered during cleaning or conservation of artefacts. All samples and slides will become part of the site archive and remain with the artefact.

The conservation report will also include recommendations for the care and curation of the assemblage; special finds with particular packing requirements will have clear handling and lifting instructions on the outside of any packaging.

25.12 Conservation Record

The conservation assessment sets out the proposed treatments for each type of artefact or material: these treatments can be discussed with the client, and with the museum, to take into account any priorities and display requirements. (See Section 9, Assessment)

25.13 Radiography

The archaeological contractor will x-ray all excavated iron objects, as well as some of the copper alloy, and any other items as requested by the excavator: information from the x-rays are incorporated into the conservation report. All metal artefacts can be x-rayed if required; only film and chemicals within their expiry date are used, washing periods are the optimum to maximise film preservation.

X-rays normally become part of the archive, and are returned to the client, with full details of exposure time and voltages used.

25.14 Record photography

All artefacts selected for conservation will be photographed (on colour slide film) at least once; usually before and after conservation, with a label and scale in the frame. Unusual artefacts, noteworthy features or modified conservation treatments will be photographed whenever appropriate.

All images will be recorded in the conservation report, and each slide labelled with the context and find number. The archaeological contractor will use Professional grade film, and a professional developing service to ensure maximum film stability. The slides form part of the conservation archive, and will remain with the artefact.

25.15 On-site conservation and conservation on call

A conservator can be available on site if required, and the conservators of the archaeological contractor can provide immediate advice over the phone at any time (specific arrangements must be made for out of hours working).

Advice on packing, lifting and transporting artefacts may be given in the early stages of a project.

25.16 Conservation treatments

The requirements of each artefact will be considered individually, and any remedial treatments carried out will use only recognised conservation treatments and approved materials. The archaeological contractor will be committed to CPD, which ensures that its conservation staff are fully cognisant with new developments in the field.

25.17 Post-excavation storage

It is recognised that budgetary arrangements may mean considerable time can elapse between excavation and conservation or Finds Disposal. All finds will be examined by a conservator on receipt; packing and storage materials will be renewed as necessary, and the archaeological contractor will ensure that all finds will be kept in a secure, stable environment until conservation treatments begin. Any finds that require immediate treatment will undergo conservation as soon as the conservators have consulted the Project Field Officer. Large volume storage at 1° C and -20° C; and storage for waterlogged material will be available in-house.

25.18 Packing

All artefacts will be packed in suitable inert materials, with silica gel if required. Fragile objects will be supported by Ethafoam, or similar, and lifting and handling instructions on the container. Especial care will be taken for artefacts, which will be going into long term storage. All containers will be carefully labelled, and box lists supplied.

APPENDIX 26

Archiving and finds disposal

26.1 Finds disposal

All artefacts and ecofacts recovered during an excavation sponsored by Historic Scotland (HS) are reported directly to HS via their own collections registrar. If all material has been fully analysed at this point, it is in most cases, transferred to an HS store. HS's Finds Disposal Panel (FDP) with permission of the Queen and Lord Treasurers Remembrancer (Q<R) then allocates the material to the appropriate museum for long term storage and possible display.

Artefacts and ecofacts recovered from excavations sponsored by other funding bodies are reported to the Crown via the Treasure Trove Advisory Panel (TTAP). The TTAP with permission of the Q<R then allocates the material to the appropriate museum for long term storage and possible display. Once the material has been allocated, it is then the museum's responsibility to arrange collection from the archaeological contractor.

26.2 Archiving

All archiving will be undertaken according to standards and guidelines set out by the National Monuments Record of Scotland (NMRS), located at the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS). The archives of all archaeological works will be deposited to the NMRS.

APPENDIX 27

Publications

27.1 General

All publications by the archaeological contractor will be clear, correct and concise accounts of what was done and will reach standards acceptable to the archaeological profession. Final reports will be published within five years of the end of fieldwork. Publications should be published in popular archaeological, general and specialist formats to inform a wide readership of what work was done and must be made available to both lay and professional audiences for the foreseeable future. Publications must also provide good value for money in terms of the content and style of the publications. In DES entries and journal publications the role of the client will be fully acknowledged. In the popular publications and monographs suggested below the role of the client will be more fully promoted, with the display of the client's logo on the cover and a foreword by their representative. The over-riding aim of the procedures outlined in this section is to ensure that, during the duration of the project, a continuous stream of information about the archaeological works is made available for peer review and public consumption. The following stages and publication vehicles are envisaged.

27.2 DES entries

After the completion of each piece of on-site work, whether it be a watching brief, evaluation, set-piece excavation or building recording exercise a Data Structure Report (DSR) will be produced (see Fieldwork procedures). These are not reports intended for publication but they usually include a short summary which will be submitted for publication in *Discovery and Excavation Scotland* (DES), an annual summary of fieldwork published by the Council for Scottish Archaeology. It is proposed that an individual entry for each piece of on-site work will not be submitted; rather a single entry summarising all the works carried out in any one year will be compiled by the Project Manager. The DES summary is a standard requirement of planning authority archaeologists and ensures that notice of ground-breaking works is disseminated throughout the archaeological community.

27.3 Journal publications

Reports on the results of excavations are normally published either as an article in an academic journal or as a monograph in an appropriate series, depending on the scale of the results. The results of the set-piece excavations will be published as journal articles with reference to other on-site works such as watching briefs and building recording, where appropriate. The publication of these articles will follow on timeously from the completion of post-excavation works.

27.4 Monograph publications

The results of all the on-site works will be drawn together in a single volume, a monograph designed primarily for academic consumption. This will be published within 5 years of the completion of on-site works.

27.5 Popular publications

The results of all the on-site works will also be drawn together in 'popular' publications that augment the academic publications in making the results available to a wider public. This is a method of providing 'community gain' to the local and national community in return for its consent, through the planning process, to alter or demolish elements of the archaeological heritage. Popular publications may include, as deemed appropriate by the client, Internet reports within the web site of the archaeological contractor, printed colour booklets, leaflets, on-site interpretative panels and exhibitions.

27.6 Editorial procedures

The archaeological contractor will apply their in-house editorial policy and procedures, through which any projects nominated for publication are normally submitted.



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Appendix 8D – Scottish Fossil Code

Scottish Fossil Code



NatureScot
NàdarAlba

Scotland's Nature Agency
Buidheann Nàdair na h-Alba

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FOREWORD



Scotland's nature is defined as including biodiversity, geodiversity and the natural elements of our landscapes and seascapes. Our fossil resources, some of which date back well over a billion years, can be thought of as our ancient nature providing glimpses into past environments, their plants, and the lives lived by the animals of times long gone. The extraordinary fossil heritage tells the story of evolution – how life evolved and adapted to changing environmental conditions and how ecosystems grew, responded or disappeared. Today, our understanding of what the fossil heritage has to tell us can help us anticipate how life will change and adapt as we face the twin challenges of climate change and biodiversity loss.

Scotland is the home to a remarkable and diverse fossil heritage. One of the jewels in the crown are 407 million year old fossil remains of the world's oldest known complete terrestrial wetland ecosystem at Rhynie in Aberdeenshire. Perfect preservation of the Rhynie plants and early animals, to the cellular level, allow us for example to learn about the adaptation of plants to high atmospheric levels of CO₂. Another globally important asset is the Middle Jurassic vertebrate fossils of Skye, that are incredibly rare elsewhere in the world, and help inform thinking on the evolution of our mammal ancestors and iconic dinosaurs.

As the fossil heritage is vulnerable to abuse and damage, such nationally and internationally important sites have statutory protection. The Skye Nature Conservation Order (2019) provides additional protection for globally important fossil localities on Skye. However, additional approaches are required to ensure that our fossil heritage, wherever it occurs, including fossil collections, is safeguarded and managed appropriately to ensure its survival for future generations. Hence, provision for Scottish Natural Heritage (now known as NatureScot) to prepare the Scottish Fossil Code is included in the Nature Conservation (Scotland) Act 2004. The Code, which was first published in 2008, aims to provide guidance for those who have an involvement in the owning, collection and care of Scottish fossils.

The Code recognises the challenges faced in the conservation management of our globally significant fossil resource to ensure its continuing and sustainable use for scientific, educational and recreational purposes. The Code applies to all those with an interest in fossils, whatever it may be. From owners of fossil localities, to collectors for research or recreational purposes, to those with a commercial interest, and to everyone who promotes and celebrates our fossil heritage. The Code encourages all of these groups to have a role looking after Scotland's fossil heritage and chimes with Scotland's Geodiversity Charter, which encourages the wise management and promotion of Scotland's globally important geodiversity.

The Code, revised to adopt a more pragmatic and impactful approach, may be thought of as a 'can-do' document. I hope it will encourage the responsible utilisation and enjoyment of Scotland's fossil heritage. The Code's guidance should empower continuation of the Scottish amateur fossil collector tradition which

includes in its roll call famous 19th century collectors such as Hugh Miller and lesser known but important collectors including Elizabeth Gray, who made a substantial contribution to palaeontological research in the 20th century. Much remains to be discovered both in terms of actual fossil finds and interpretation of what they can inform us about our journey from the past into the future. The Code will not only encourage and enable responsible discovery it will lead to enhanced public interest in the fossil heritage of Scotland for generations to come.

I celebrate the re-publication of the Scottish Fossil Code and hope that it will continue to encourage responsible utilisation of a world-class resource that is an intrinsic part of Scotland's nature. I encourage everyone with an interest in fossils to support the guidance it contains.

[Redacted]

Lorna Slater MSP
Minister for Green Skills, Circular Economy and Biodiversity
Scottish Government

PREFACE

Scotland is recognised in the global context for its rich, diverse and highly significant fossil heritage. This geological aspect of Scotland's nature is our record of past life and environments on planet Earth and it helps us to understand the rapidly changing world that we live in today. New fossil finds are constantly being made in Scotland that help to fill the gaps in our understanding of the evolution of life on Earth.

Scotland's fossil heritage is an irreplaceable and non-renewable resource that has been millions of years in the making. Consequently, if not properly looked after and managed, aspects of it may be susceptible to damage and destruction through factors including irresponsible collecting and the neglect of collected specimens. In recognition of this the Nature Conservation (Scotland) Act 2004 required Scottish Natural Heritage, now known as NatureScot, to prepare the Scottish Fossil Code. The requirement acknowledges the value and vulnerability of Scotland's fossil heritage and that legislative measures alone cannot entirely safeguard it.

The Code provides essential information on the nature of Scotland's fossil heritage and the need for its appropriate management and safeguard. It is aimed at everyone with an interest and involvement in the fossil heritage and outlines the roles and responsibilities of those that own and utilise palaeontological resources. It therefore applies to owners and managers of fossil localities and those that collect, study and curate fossils including palaeontological research scientists, recreational collectors and those with a commercial interest.

The Code recognises that seeking out and collecting fossils is an essential activity providing the raw material and data for the science of palaeontology as well as being an educational and recreational hobby. It therefore provides information, advice and best practice recommendations concerning the responsible collection of fossil specimens in Scotland, irrespective of where they occur, with the objective of ensuring that collecting is undertaken responsibly within the law. Just as importantly the Code also provides information and best practice recommendations in the identification, conservation, acquisition, sale, careful storage and donation of specimens. In doing so it aims to ensure that Scotland's fossil-bearing resources and collections are managed in such a way that they will be useful to future generations. As well as benefiting Scotland's fossils, both in collections and that still await discovery, it is hoped that the Scottish Fossil Code will enhance public interest and awareness of Scotland's fossil heritage.



LEGAL STATUS OF THE CODE AND ADHERENCE EXPECTATIONS

Although established by statute the Code itself is non-statutory. The Code is, therefore, not a law and so the best practice recommendations concerning the collecting and care of fossils is not mandatory. However, the Code provides important information on the legalities of ownership, and the regulations concerning protected fossil localities, which should be taken into consideration if fossil collecting in Scotland.

Whilst setting out the precise legal obligations, the Code aims to be fair and balance the objectives of helping prevent damage to fossil localities and resources whilst not impeding generally harmless and responsible fossil collecting. In this respect, the Code recognises that seeking out details of land and mineral right ownership may be beyond the resources of otherwise responsible and minor-scale collectors.

The Code's pragmatic approach means that judgement and proportionality are important when considering the legal obligations and best practice recommendations. There is an expectation that professional research scientists, recreational collectors with an interest in research, and commercial collectors, attain and adhere to the highest standards concerning the collecting and care of fossil specimens in Scotland.

Due regard of compliance or otherwise with the Code may be given in the consideration of any offences and associated prosecution.



HOW THE SCOTTISH FOSSIL CODE IS ORGANISED

Part 1

An introduction to fossils and the fossil heritage of Scotland, outlining their importance and use. The various threats to the fossil heritage are noted together with the means employed to conserve it.



Part 2

Legal information and advice concerning the ownership, collecting and sale of fossils.



Part 3

Information and best practice recommendations for the responsible collecting and care of fossils including advice on donating specimens.



Part 4

Information and best practice recommendations for owners and managers of fossil localities, specialists and other groups with a particular involvement in Scotland's fossil heritage.



Appendix

Information on museum and other public collections.



ESSENTIALS OF THE SCOTTISH FOSSIL CODE

Collector responsibilities:

If collecting fossils in Scotland, please do so responsibly and follow the best practice in the collection and storage of fossil specimens outlined in the Scottish Fossil Code.



Seek permission

Traditionally common fossils and small geological specimens are collected without permission and hindrance. However, lawfully the right thing to do is to obtain permission to extract, collect and retain fossils.



Access responsibly

Consult the Scottish Outdoor Access Code prior to accessing land. Be aware that there are restrictions on access and collecting at some locations protected by statute.



Collect responsibly

Exercise restraint in the amount collected and the equipment used. Be careful not to damage fossils and the fossil resource. Record details of both the location and the rocks from which fossils are collected.



Seek advice

If you find an exceptional or unusual fossil do not try to extract it; but seek advice from an expert. Also seek help to identify fossils or dispose of an old collection.



Label and look after

Collected specimens should be labelled and taken good care of.



Donate

If you are considering donating a fossil or collection choose an accredited museum, or one local to the collection area.



Owner and land manager responsibilities:

Owners of fossil localities and those that manage the land where they occur have an important role in looking after the fossil resource. Your responsibilities may include ensuring that any fossil collecting taking place on your land follows the best practice guidance set out in the Scottish Fossil Code. This is particularly the case if a fossil locality on your land has statutory protection.





PART 1: INTRODUCTION TO SCOTLAND'S FOSSIL HERITAGE AND HOW IT IS USED

1.1 What is a fossil?

Historically, the word 'fossil' was applied to anything dug up out of the ground. Thus, mineral deposits and archaeological relics were referred to as 'fossil'. However, since the early 19th century, the term has become exclusively applied to the remains of ancient life.

Palaeontology is the study of fossils; it may be defined as the study of life forms that existed in past geological periods, as represented by fossilised remains of plants and animals. Geologists, specifically palaeontologists, utilise and study fossils.

For the purposes of the Code the great majority of fossils can be defined simply as 'the remains of, or traces made by, an ancient animal, plant or other organism preserved in rock'. There are basically two types of fossils:

Body fossils – representing the whole or parts of an actual animal or plant. The actual original material of the organism, such as shell, bone and wood, may be preserved as it is, or is altered physically and chemically by rock-forming processes (fossilised) to another substance. Even if only an impression or cast of the object is preserved, it is still a fossil.

Trace fossils – the evidence of the activity of an organism. These include fossil footprints and trackways made by animals such as dinosaurs and scorpions; burrows made by worms and many other animals; and even fossil excrement (coprolites).

The fossilisation of an organism or its traces is an unlikely process that occurs only in certain geological circumstances. Therefore, all fossils may be regarded as special.

Most fossils that are collected are 'macrofossils', those large enough to be seen without the use of a microscope. However, many sedimentary rocks, especially limestone and shale, contain numerous 'microfossils', some of which are only fractions of a millimetre in length, that require specialist extraction and study techniques. Chalk, for example, consists almost entirely of microfossils.

Objects known as 'pseudofossils' are pieces of rock, or patterns within rock, that superficially resemble an organism. Many pseudofossils are rocks weathered by chance into a shape resembling an organism, or are chemically produced features in rocks, or marks made on rocks by modern organisms. All fossil collectors find objects that may be identified as pseudofossils.

1.2 Where fossils are found and collected from

Scotland's land surface is underlain by a complex patchwork of rock types of different ages. Large areas are formed from igneous rocks (derived from molten rock) and metamorphic rocks (rocks altered by heat and pressure) which are normally unfossiliferous. A few fossils occur in rocks associated with volcanic activity, and are preserved in ash, or in some exceptionally rare cases lava. However, nearly half of the 78,000 km² land surface of Scotland is underlain by sedimentary rock and it is in these rocks that Scotland's fossil heritage is found.

Sedimentary rocks generally form from the accumulation of layers of sediments such as sand and mud, within a variety of environments such as oceans, tropical seas, rivers, lakes and deserts that have existed through geological time. Fossils are the remains of life that lived in these environments.

Rocks that were originally deposited in marine conditions are generally more fossiliferous than those deposited on land, and limestones are generally more fossiliferous than sandstones. Fossils might in principle be found in any outcrop of sedimentary rock, but the most productive localities, where rock is typically more exposed, are:

- coastal exposures on foreshores;
- natural outcrops associated with streams, rivers and hills; and
- quarries and other man-made exposures.

Some of Scotland's sedimentary rocks of Precambrian age yield fossils, but the majority occur in rocks of Cambrian to Quaternary age. Marine fossils from Carboniferous limestones of the Midland Valley of Scotland are among the most commonly found Scottish fossils. These include brachiopod shells and corals found in locations such as the Fife coast, Ayrshire and East Lothian. Fossils from the Jurassic Period include those of marine animals such as ammonites and belemnites and are reasonably common in certain areas of Skye and the north-east coast of Scotland in the vicinity of Brora and Helmsdale. Fossil fish remains, dating from the Devonian Period are common in some areas of Caithness and Orkney.



The distribution of sedimentary rocks of different ages is shown on geological maps, and descriptions of fossil localities may be given in some geological field guides. Information is also available through websites and museums. Providing specific advice on localities where fossils may be collected is beyond the statutory direction given to prepare this Code. Geodiversity Conservation Groups and Geological Societies may be able to offer advice and recommendations on where fossils may be found in your local area. Advice may be available on-line posted by groups and commercial organisations. However, care should be taken to ensure that following advice and recommendations, from such sources, is not at odds with the best practice recommendations outlined in this Code.

NatureScot owns Achanarras Quarry in Caithness where the opportunity to collect fossils is available to all provided the on-site guidance is adhered to and any fossils that are collected are not sold.

1.3 How fossils are preserved and classified

Fossils are preserved in a wide variety of ways. The rock-forming processes, by which most fossils are preserved, can take place gradually over millions of years. This is a continuous process, and the point at which an object becomes a fossil can be the subject of debate based on a number of criteria such as the decay of organic matter, the point at which organic material is replaced by minerals (mineralised), and its age. On rare occasions fossils may be preserved by catastrophic events such as volcanic ash falls.

The process of fossilisation involves initial burial of the object beneath successive layers of sediment. Eventually the object may become buried over a time period, that may span millions of years, tens to thousands of metres below the surface. During burial, processes involving circulating ground water and elevated temperature and pressure, turns the sediment to rock and the object becomes fossilised. In most situations for a buried fossil to be found, the rocks have to go through tectonic uplift and erosion so that the fossil-bearing rock is exposed at the Earth's surface.

Examples of preservation:

Relatively unaltered – for example insects preserved in amber.

Physically altered – for example shells crushed in shale, fossil fish in Caithness flagstone.

Chemically altered – the organic material may be replaced by minerals (petrification), or minerals may fill spaces in the organic structure (permineralization). The internal structure in, for example, shell, wood or bone, may not be preserved if the object is replaced by a new mineral. The most commonly observed examples are the petrification of wood by silica or calcium carbonate, and the replacement of shell material by calcium carbonate (calcite), iron sulphide (pyrite) or silica (for example quartz, flint, or chert).

Fossils are sometimes found within concretions, which are spherical to oval-shaped structures, that develop inside sediments, when they are still soft, before they harden into rock. They form as minerals within a sediment precipitate around a fossil or other nucleus. When a concretion is broken open it can sometimes reveal a fossil which, in the Devonian rocks of the Moray Firth area, can be the remains of fossil fish.

It is important to be able to recognise features of physical and chemical preservation, since these have an important bearing on the methods used to extract and clean the fossil, and may affect the conditions in which it needs to be kept.

The word 'rock' in the above definitions includes not only hard ('lithified') rocks that require a hammer to break them, but also poorly consolidated clays and sands. The remains of animals and trees within peat, soil, and other unconsolidated material, that date from around the time of the last glaciation to fairly recent times, may still be regarded as fossils.

Fossils are classified in the same manner as modern animals, and are scientifically described, and given binomial formal scientific (Latin) names. Thus, *Homo sapiens* is the formal scientific name applied to human beings. Very few fossils have been given common names, hence fossils are generally referred to by their formal scientific names. Most palaeontology textbooks are organised according to biological classification.



1.4 When a fossil is an archaeological find

Although animal and plant remains in peat, soil and other unconsolidated material may be regarded as fossils, when such finds are associated with archaeological sites, they are, for the purposes of this Code considered archaeological finds. They are therefore excluded from the Scottish Fossil Code, even though some processes of fossilisation may have taken place after burial.

Archaeological finds comprise all human artefacts and other objects made or modified by people, including natural objects altered by human action such as bones that had been cut or worked in any way. Archaeological finds are subject to the Crown's right to Treasure Trove and the common law of bona vacantia (the legal name for 'ownerless goods') irrespective of material, age, origin, location or context. They must therefore be reported to the Treasure Trove Unit c/o National Museums Scotland. Doubtful cases must also be reported, as failure to report is an offence.

The Scottish Fossil Code also excludes all human remains, as they have special legal status. These are not 'collectable', cannot be owned as property, and must be treated with the respect afforded them under the law.



1.5 The nature of the fossil resource

In general terms Scotland's fossil resource can be regarded as vast. The natural processes of weathering and erosion, such as occur at the coast, and human activities, for example quarrying, continue to reveal new fossil-bearing rocks. Together, these processes provide opportunities for the discovery and collection of fossil material.

A layer of rock that represents and preserves the floor of an ancient sea can provide a huge resource of fossilised marine creatures. However, not all fossil-bearing resources are that extensive. The remains of some ancient environments such as hot springs or lagoons, preserved as localised layers in the rock record are, by their nature, of limited extent. The fossil resource within rocks only accessible in a disused quarry or coastal cliff, where there are low rates of erosion, can also be regarded as limited. There are also many situations where the fossils themselves are naturally rare.

1.6 The scientific importance of the fossil heritage

Scotland has a remarkable variety of fossiliferous rocks. In what is a relatively small area, there are fossils representing all the periods of geological time from the Precambrian to the Quaternary, spanning more than 1,200 million years of Earth's history.

Some of the major geological events that shaped Scotland are documented by fossil assemblages. The similarity of Cambrian fossils in the North West Highlands with those in North America show that the two areas were once geographically very close to each other. The fossil record of Ordovician and Silurian marine animals in the Midland Valley of Scotland and the Southern Uplands shows that they were mixing with other populations of marine creatures from opposite sides of a closing ocean, as plate tectonics brought slices of the crust that forms Scotland's foundations together. During ocean closure, sediments from the ocean floor were uplifted and now form the Southern Uplands. An understanding of precisely how and when this occurred, and therefore how the evolution of the Southern Uplands took place, has been achieved partly through the study of fossilised planktonic organisms known as graptolites.

Scottish fossils have, in such ways, played an important role in the interpretation of the succession of changing geographies and environments that existed throughout Scotland's long and varied geological history. Fossils are also used to date rock sequences and enable correlation with other areas of the world allowing Scotland's geological history to be tied into the global story.

Historically, Scotland was at the cutting edge of geology when the science developed in the late 18th and early 19th centuries. The early Scottish geologists James Hutton, Charles Lyell, Roderick Murchison, James Nicol, Hugh Miller and others established basic geological principles based on rocks and fossils from Scottish localities. The fossil collecting activity of Miller and other important fossil hunters, such as Elizabeth Gray, made some of these fossil localities widely known to the general public. These fossil localities are of historical and cultural importance to the world as well as being scientifically valuable.



1.7 Scotland's world-class fossil heritage

Scotland has many world-class fossil localities. Examples of exceptional Scottish fossils include:

- Extraordinary Silurian sea scorpions and other arthropods found at Lesmahagow.
- Some of the world's earliest terrestrial arthropods discovered at Stonehaven, Aberdeenshire.
- Perfectly preserved small plants and arthropods in an Early Devonian hot spring deposit at Rhynie, Aberdeenshire, representing the world's earliest and most complete terrestrial wetland ecosystem.
- Middle Devonian fossil fish of Caithness, Orkney, Shetland and the Moray Firth, which lived in a vast freshwater lake that once covered the area.
- Fossilised shrimp-like crustaceans of Lower Carboniferous age, superbly preserved at Gullane, East Lothian.
- The first complete remains of a fish-like organism known as the 'conodont animal'; a formerly enigmatic organism only known by its microscopic teeth, found in Carboniferous rocks at Granton, near Edinburgh.
- One of the most important fossil shark localities in the world found in Carboniferous rocks at Bearsden in Glasgow.
- Stands of Carboniferous fossil tree stumps in Victoria Park, Glasgow, and at Saltcoats on the Ayrshire coast, which are fragments of equatorial coal forests.
- Bones, moulds and trackways of Permian and Triassic reptiles that lived around desert sand dunes in what is now the Elgin area.
- Middle Jurassic dinosaur, pterosaur and mammal remains of Skye.
- Exceptionally well preserved leaves of Palaeogene age on Mull and Skye from trees that were living in a warm climate as the North Atlantic Ocean was opening.
- The remains of animals, including polar bear, in the caves of Assynt, dating from around the time of the last glaciation.

These are just a few of the fossil highlights scattered in space and time through the long geological history of Scotland. All of these locations are of great significance from the perspective of understanding the evolution of life on Earth and in the historical development of geology.

1.8 How fossils are used

Scotland's fossil heritage is an important scientific, economic, educational and leisure resource which has a wide range of users including research scientists, students, school pupils, recreational collectors, commercial collectors and the general public.

1.8.1 Scientific research and display

Scientific palaeontological research is active in Scotland, involving universities, museums, the British Geological Survey, and recreational collectors. There is little doubt that much fossil material awaits discovery and description in Scotland with new scientific techniques such as CT scanning being utilised to investigate fossil finds. Fossil discoveries are described in scientific journals such as the Scottish Journal of Geology and the Earth and Environmental Science Transactions of the Royal Society of Edinburgh, and particularly spectacular finds are frequently reported in the media. On behalf of the public, museums collect and purchase fossils for research and display.



1.8.2 Education

Fossils are used in teaching from primary school to postgraduate education and lifelong learning. Schools, colleges, universities and museums all have roles to play in geological education involving the use of fossil specimens. Educational themes include the use of fossils in demonstrating the evidence for biological evolution; dating and correlating rocks in different places; and interpreting ancient environments and their ecologies and geographies (palaeoecology and palaeogeography). The process of forming a documented scientific collection is also an educational exercise.

1.8.3 Recreational collecting

Recreational fossil collecting is an enjoyable, rewarding and popular leisure activity that can contribute to the science of palaeontology. Involvement ranges from those who casually make chance finds, to those for whom collecting is a hobby and make journeys to fossil localities specifically for fossil collecting. Such recreational 'field collecting' is educational, and finds of scientific value are frequent. Serious recreational collectors maintain labelled collections of their finds, and seek professional advice on identification. The hobby may extend to researching fossils found and the geological setting in which they occur giving rise to collaborative work with professional research palaeontologists.

There are also 'assemblers of collections of fossils', sometimes referred to as 'cabinet collectors', who choose not to undertake field collecting themselves, their collections being made through purchase and/or gift and exchange.

1.8.4 Tourism

International interest in Scotland's fossil heritage results in tourist visits from the rest of the UK and from overseas. Tourists visit museums to view displays, and some visit fossil localities to collect. Some locations offer spectacular fossils still in the situation where they were discovered, such as the fossil tree stumps at Fossil Grove in Glasgow's Victoria Park, MacCulloch's Tree on the west coast of Mull, the reptile footprints and trackways of Elgin and the dinosaur footprints of Skye.

1.8.5 Commerce

There is a worldwide market in fossils. Scottish fossils form part of that market, with specimens being extracted and then sold commercially, both in the UK and abroad. Currently, there are no figures available on the value of the fossil 'industry' to the Scottish economy.

Rare and unusual fossils may command a high price in the world of collectors and museums, and may also have a high scientific value to researchers. Common fossils such as ammonites, belemnites and brachiopods may sell for a few pounds, with larger, well-preserved and prepared specimens commanding higher prices (tens to hundreds of pounds) according to rarity and quality. Common Scottish fish fossils can be bought for less than £50, but rare fish, amphibians and reptiles can sell for many thousands of pounds depending on condition. Costs also reflect the labour and skill in preparing fossils for scientific research and display; the commercial value of the most common fossils may be below the cost of collection, when time and travel are considered.

Many large and visually impressive fossils sold for large sums are not necessarily rare, and if locality details are missing, they are of diminished scientific value. Some insignificant-looking fossils, on the other hand, may have a high scientific value, but small commercial value.

Commercial collectors provide museums, universities and educational outlets with an opportunity to purchase fossil material. Most commercial collectors are skilled and responsible and provide a service to science, to other collectors and the general public.

1.9 Threats to Scotland's fossil heritage

Scotland's fossil heritage is an irreplaceable and non-renewable resource that has been millions of years in the making. Consequently, if not properly looked after and managed, it is vulnerable to being damaged and destroyed. There are six principal threats: natural erosion, climate change, quarrying, land-use change, irresponsible collecting and the neglect of collected specimens.

1.9.1 Natural erosion and climate change

In certain areas, particularly sea and river cliffs, weathering and erosion can reveal fossil material. However, the natural mechanisms that uncover fossils in the first instance also damage and destroy them. In these cases, it is argued that the responsible collection of newly exposed fossils, especially if loose, is highly desirable and of conservation value, since without collection the fossils would inevitably only become weathered, eroded and lost.

Sea level rise, driven by a warming climate, is likely to lead to the loss, through submergence, of fossil resources within intertidal areas. Human activity to combat the effects of rising sea level could lead to coast protection works that may involve the building of rock armour berms, gabion banks and wave-return walls exacerbating pressure on palaeontological resources. Such development could have the impact of obscuring rock exposures and preventing access for scientific research, education and collecting.

1.9.2 Quarrying

Commercial quarrying of a fossil-bearing rock, a limestone for example, is the other main means by which new fossil material is revealed, but it can also be a threat. However, this is the nature of quarrying, and in many cases the loss of fossils during the lifetime of a quarry is not significant as the resource being quarried is vast and therefore some of it will survive for scientific research and educational purposes. There are however some rare situations where quarrying could lead to the loss of a fossil-bearing rock layer that has only a very limited extent.

The importance of quarrying to palaeontology is highlighted by the fact that many extremely important fossil discoveries are made in active quarries. It is also reflected in the considerable number of disused quarries which are now geological sites protected by statute. In many instances quarrying, like natural erosion, is valuable in renewing exposures of fossil bearing rock and making available previously inaccessible rock sections.

1.9.3 Land-use change

One of the primary causes of losing fossil localities in Scotland is through changes in land-use. The infilling of quarries, river valleys and disused railway cuttings with waste, are means by which fossil localities become obscured, buried and lost.

Similarly the afforestation of hillsides and river banks with conifers and woodland regeneration, undertaken without due consideration for fossil-bearing resources, can lead to the prevention of access and the accumulation of plant debris that in time can lead to soil formation and rock outcrops becoming lost from view.

Regeneration of woodland to help combat rising CO₂ levels and promote gains in biodiversity, if not carefully managed, could in some instances, exacerbate pressure at some palaeontological localities.

1.9.4 Irresponsible collecting

In some circumstances, fossil collecting may not be harmful to fossil resources and fossil localities. This is particularly true where the fossils are relatively common or the locations in which they are found are subject to high levels of natural or artificial degradation, such as coastal cliffs that are being eroded rapidly or large quarries that are being actively worked. In such situations collecting fossil specimens, that might otherwise be destroyed, can benefit our understanding of geology provided that they are properly documented and made available for study. Collecting also helps prevent fossil locations becoming neglected and overgrown. Ongoing fossil collecting can therefore be a valuable activity in the management and safeguarding of our fossil heritage.

However, some localities are highly sensitive to certain fossil collecting activities, and if these activities are not carefully managed, the scientific value of the resource can be damaged and, in the worst case, destroyed. Locations where there is either a limited fossil-bearing resource, or the fossils are exceptionally rare, are particularly vulnerable and susceptible to damage. Such locations include disused limestone and building stone quarries in the Midland Valley of Scotland and Caithness, which may date back to the 19th century and have an important role in the development of palaeontological science. Other sensitive locations include slowly eroding coastal cliffs, such as occur on Skye, and situations where fossils exposed at the surface are used for educational field demonstrations. In geoconservation terms, when a fossil-bearing resource is extremely limited in extent, it is regarded as 'finite' and particularly vulnerable to irresponsible collecting. Such resources include fossil-bearing cave deposits.

Mechanical diggers, rock saws, crowbars, sledgehammers and even explosives have all been used to collect fossils in Scotland, to the benefit of palaeontological research. However, in the hands of irresponsible collectors, such equipment can cause enormous damage and can threaten to destroy vulnerable fossil-bearing resources and the fossils they contain. Excavation by collectors at river and coastal exposures can cause undermining, resulting in the collapse of rock faces, and burial of fossil-bearing layers.

When rare and particularly significant fossils are collected by inexperienced and/or irresponsible people, the fossils can lose their geological context and much of their value as objects of study. The collectors may not recognise the importance of a find, or fail to record essential information at the locality.

1.9.5 Neglect of collected specimens

The failure to adequately care for collected specimens and collections as a whole can result in their deterioration and loss. This threat to the fossil heritage is not peculiar to specimens and collections in the possession of recreational collectors, since inadequacies in funding and staffing can threaten curated museum-based and research collections.



1.10 Conserving Scotland's fossil heritage

The landscape and its underlying geology comprise a fundamental part of the natural heritage underpinning Scotland's biodiversity. Although they give the impression that they are solid and fixed for all time, they are vulnerable to development pressures and changes in land-use. Scotland's irreplaceable geological heritage, including fossil resources, have to be adequately conserved and managed wisely for the benefit of future generations.

In an effort to conserve and afford protection to the geological heritage of Britain, the then Nature Conservancy Council undertook the Geological Conservation Review (GCR). This project, which began in 1977 and was completed in 1990, used the highest scientific standards to identify systematically the key Earth science sites in Britain. Together these GCR sites reflect the range and diversity of Great Britain's geological heritage and demonstrate the geological history and development of the country.

Each site selected for the GCR is of at least national importance for geological heritage conservation, and many of the sites are of international importance. In Scotland, the GCR process selected 804 sites, of which 84 were selected specifically for their fossil fauna and flora. An additional 107 sites selected to represent various periods in Scotland's geological history contain fossil-bearing rocks.

In time the list of Scotland's GCR sites will be reviewed. It is expected that some new palaeontological sites will be added to the register, as new discoveries are made. Some GCR sites may be removed from the register if they are destroyed by damaging over-collecting that has 'worked out' a particular fossil horizon. A public record of all Scotland's palaeontological GCR sites is available through the published Geological Conservation Review Series.

Most GCR sites in Scotland have statutory protection and are designated Sites of Special Scientific Interest (SSSI). Designation as an SSSI affords GCR sites protection from damaging activities.





PART 2: FOSSILS AND THE LAW: OWNERSHIP, ACCESS AND CONSERVATION

The fossil heritage of Scotland, like any other aspect of our natural and cultural heritage, is owned and managed property some of which, given its national or global importance, has statutory protection. This part of the Code outlines key legalities governing how fossil resources and specimens are considered. This encompasses fossil resource and specimen ownership, protected site management, access to land for the purpose of seeing fossils and also for their excavation, collection, removal and sale in accordance with the law. It also addresses instances where collecting is not permitted and how to deal with collections that are no longer required. Best practice recommendations are also provided for the purchase of fossil material, and what ought to be done in the event of witnessing damaging fossil collecting.

Collectors need to recognise property rights and the statutory protection that is in place for some fossil localities. Scientific researchers, recreational collectors undertaking research and those that collect for commercial purposes need to be acutely aware of their collecting activity in the context of these rights and protections.

2.1 Ownership of Scotland's fossils

From the legal perspective, fossils in Scotland are treated as 'minerals' in the legal sense of the word. 'Minerals' also include coal, building stone and other substances in or under the land obtainable by underground or surface working. Scotland's fossil resources, whether they occur loose or part of bedrock exposure, are owned in law by the relevant holders of the mineral rights, be they private, public, voluntary sector or Crown Estate Scotland.

The owner of mineral rights over an area of land may not necessarily be the owner or even the occupier or manager of the land. This situation can arise where a fossil locality, on an area of farmland, is owned by one person, the mineral rights and thus the fossils are owned by another, and the land itself is occupied and managed by yet another. This can make the process of identifying the mineral rights owner challenging and it is recognised as probably not practically possible for many collectors. However, it becomes particularly important when larger groups are visiting and necessary when significant and large-scale collecting is proposed (see Section 3.2).

Land ownership around the Scottish coast is mixed and complex, Crown Estate Scotland manages around half of the intertidal zone, between mean high water springs (MHWS) and mean low water springs, but sea-cliffs and beaches lying above MHWS will be owned and managed by other organisations or individuals.

2.2 Accessing land to visit fossil localities and collect fossils

Visiting fossil localities in the countryside to see and collect fossils involves accessing land owned by an individual or an organisation. Under the Land Reform (Scotland) Act 2003, everyone has access rights over most land and inland water in Scotland, for recreational purposes, some educational and commercial purposes, and for crossing from place to place. However, access rights come with responsibilities and are conditional on those taking access doing so responsibly. Having the right to take access over land does not mean that people have the right to extract or remove fossils, which are the property of the owner of the mineral rights associated with the land. The Land Reform Act specifically excludes being on or crossing land for the purpose of taking anything away for commercial use or for profit.

The Scottish Outdoor Access Code provides guidance on the responsibilities of the public and owners and managers of land in relation to public access.

- **The Scottish Outdoor Access Code should be consulted prior to accessing land to view or collect fossils.**

Access rights do not extend to works locations such as working quarries and mines, building or civil engineering sites, and railway and motorway cuttings. Access to these places can be dangerous and is restricted by law.

- **Accessing locations such as working quarries and mines, building or civil engineering sites, and railway and motorway cuttings requires appropriate authority.**

2.3 Permission to collect and keep fossil specimens

In practice common fossils and small geological specimens are collected without permission and usually without hindrance. In many situations the collection of fossils that would otherwise be lost, for example through erosion, may be regarded as an act of conservation. However, from a legal perspective removing fossils without permission is illegal. Technically this includes loose fossils, or stones containing fossils, from beaches and the intertidal zone, and in whatever other setting fossils may be found, even if they appear to be abandoned.

To lawfully extract, collect and retain fossils that are either loose or form part of any bedrock exposure, requires permission from the owner of the mineral rights. The permission of the landowner, occupier or manager of the land may also be required. In addition to obtaining permission there are procedures in place at fossil localities that are protected as Sites of Special Scientific Interest (SSSI) which may have to be adhered to. This could involve consent being sought from NatureScot (see Section 2.4.1)

- **Traditionally common fossils and small geological specimens are collected without permission and hindrance. However, lawfully the right thing to do is to obtain permission to extract, collect and retain fossils.**

If collectors decide to seek permission to look for, remove and retain fossil specimens, they should decide for themselves how to go about doing so as there is no overseeing body which undertakes that particular role on their behalf.

2.4 Protected fossil localities and instances where collecting may either be discouraged or not allowed

Internationally Scotland is recognised for having a robust mechanism for the conservation of nature which includes the geological and fossil heritage as well as biodiversity. Many of the most scientifically important fossiliferous localities around Scotland have statutory protection. Locality protection is a 'site-based' approach to nature conservation the foundation of which is the protected areas network. Locations protected for the geological and fossil heritage, often referred to as 'protected areas', are established through the legal provisions in the Nature Conservation (Scotland) Act 2004.

Protected areas may also be established on a voluntary non-statutory basis. For example as part of a Local Nature Conservation Sites (LNCS) network.

2.4.1 Sites of Special Scientific Interest (SSSIs)

Designation as a Site of Special Scientific Interest (SSSI) is the main statutory

mechanism for geological and palaeontological conservation in Scotland. Each palaeontological SSSI, which may be considered as the best, most important and representative palaeontological localities in the country, is underpinned by a GCR site (see Section 1.10).

NatureScot advises land owners and others on the management of SSSIs and, where appropriate, supports work to enhance the value of SSSIs, for example through clearing rock exposures of rubbish and encroaching vegetation. NatureScot also monitors the condition of the geological and palaeontological features in SSSIs, and may support their scientific study. Where SSSIs have palaeontological features, land owners and land managers have an important role to play in looking after these protected fossil resources on their land.

To ensure that protected features on a SSSI are not damaged, land owners and managers are provided with a list of 'Operations Requiring Consent' ('ORC list'). These are operations that are likely to damage any of the natural features of a SSSI. A land manager must obtain consent from NatureScot before they carry out any of these listed operations. Similarly, a land manager must obtain consent from NatureScot to allow someone else to carry out one of the operations. If NatureScot considers that an operation requiring consent, being proposed on an SSSI, is likely to damage protected features it may suggest other ways to carry out the work. This could be to only partially infill a fossil-bearing quarry, or not plant trees too close to an important fossil bed. NatureScot can only give consent to owners and occupiers of the land, or to public bodies when carrying out their normal functions. NatureScot cannot issue consent to third party members of the public. ORC lists, which are specific to each SSSI, are accessible to view on NatureScot's website.



- **Owners and managers must obtain consent from NatureScot before carrying out or permitting operations likely to damage protected features.**

In cases where public bodies need to undertake operations that affect a SSSI, the Nature Conservation (Scotland) Act 2004 places a duty on them to consult Scottish Natural Heritage (NatureScot); have regard to NatureScot's advice; and take reasonable steps, in the proper exercise of their functions, to further the conservation and enhancement of the natural features of the SSSI. Universities and some museums can be considered public bodies.

- **Public bodies have a duty to consult NatureScot before carrying out, or permitting, any activities which may affect an SSSI.**

SSSI protection helps safeguard sites from development but can also help safeguard them from damaging fossil collecting. In many cases, owners and managers of fossil localities will need consent from NatureScot to excavate and remove fossils and also to allow other people to do so (also see Section 4.1.1). **Generally speaking, collecting loose fossils in many SSSI is not a concern from conservation and scientific perspectives, but collecting fossils from bedrock is a different matter.** However, provided the required permission is sought from the land owner and any necessary SSSI consents are secured from NatureScot, particularly for scientific research, then collecting from bedrock can take place.

- **Owners and managers of fossil localities should be aware that some fossil collecting activities within SSSI, particularly the extraction of fossils from bedrock undertaken by visiting collectors, requires them to seek consent from NatureScot.**

NatureScot has sampling guidance for scientific researchers in place that, in relation to palaeontological sites, allows the development of a considered and sustainable approach to collecting fossils from bedrock in SSSIs. Although the collection of fossils from bedrock, that is a protected feature of an SSSI, is damaging, if it is undertaken for research, it is acknowledged that the gain for science can outweigh the damage.

It is important to note that in the absence of any specific mention of fossil collecting in the ORC list, for a particular SSSI, the requirement to seek permission and SSSI consent, to collect fossils, may still apply (for example where extraction of minerals is on the list). **The exclusion of an ORC pertaining to the removal of rock, minerals and fossils from an ORC list does not imply that a third party fossil collector is free to collect as they wish.** It is important to be aware that, regardless of the operations listed in the ORC list, damaging protected geological features in a SSSI, for example by hammering, is still an offence.

Having secured permission, and any necessary consents, a responsible approach to fossil collecting in SSSIs is essential to minimise damage to rock outcrop and conserve the resource. Achieving this maintains the scientific value of the sites for research and the benefit of future generations.

- **Collectors should be familiar with any collecting regulations that may be in place before visiting SSSIs. If they don't know, they should ask.**
- **Collectors should be aware that in SSSIs collecting from bedrock, and in some rare cases loose rock and fossils, may involve requesting land owners to approach NatureScot to secure SSSI consent on their behalf.**
- **If collectors are in doubt about collecting regulations at an SSSI then they should not collect.**

The fossil-bearing rock resource in some SSSIs can be very limited in extent. Similarly the fossils in a particular SSSI may be incredibly rare and of considerable scientific value. Consequently, such sites are vulnerable to fossil collecting of any kind. In these locations fossil collecting for scientific research may be regarded as acceptable 'loss' and 'damage', to the fossil-bearing resource, with all other collecting approaches being actively discouraged. Even in research situations, to ensure the information derived during excavation is maximised, investigation may have to adopt a multidisciplinary approach. A multidisciplinary approach involves a team with a wide range of specialist palaeontological and geological interests coordinating and concentrating attention on a minimum amount of excavated fossil-bearing resource. This approach avoids a particularly limited resource being targeted multiple times for excavation in pursuance of different but related scientific research projects.

It is an offence for any person to intentionally or recklessly damage the natural features of an SSSI. Some SSSIs, that have suffered damage as a consequence of fossil collecting, carry signage conveying messages specific to collecting at the site.

- **Signage regulating collecting at fossil locations must be adhered to.**
- **The absence of signage, prohibiting collecting, at fossil localities does not imply a right, freedom, or permission to collect.**

2.4.2 Areas of Skye protected by the Skye Nature Conservation Order 2019

In addition to the SSSI designation the Nature Conservation (Scotland) Act 2004 also includes provision for the protection of a natural feature by means of a Nature Conservation Order (NCO). There is one NCO in operation in Scotland designed to give extra legal protection to fossils. The 'Skye Nature Conservation Order 2019' was issued to prevent damage to, and removal of, Middle Jurassic vertebrate body and trace fossils on Skye. It bolsters the statutory protection of fossil remains within existing SSSI and other areas, where the principle threat is from irresponsible collecting. It is an offence for any person to undertake prohibited operations in areas of Skye protected by the NCO. Exceptions are in place to ensure the continuation of scientific research.



- **A Nature Conservation Order (NCO) affords extra statutory protection at fossil localities on Skye.**

2.4.3 Non-statutory Local Geodiversity Sites

Although Scotland has a network of statutorily protected sites, fossil localities in the wider countryside are also under threat from damaging activities. Some fossil locations not protected by statute have 'Local Geodiversity Site' recognition, belonging to the 'Local Nature Conservation Sites System'.

- **Fossil collecting at non-statutory protected Local Geodiversity Sites may not be encouraged. If there is doubt the local geoconservation group could offer advice.**

It is possible for individuals to volunteer and become involved in the conservation of fossil localities, through a local geological society, and by either joining or forming a local geodiversity conservation group.

2.4.4 The built heritage

Some Scottish building stones contain fossil material. Similarly, field boundary dry-stone dykes and animal pens sometimes incorporate fossiliferous blocks of stone. In these situations, the fossils are an educational resource to be examined in situ. They are not to be collected, as this would be a criminal offence.

- **On no account should fossils be collected from stone in dry-stone dykes, walls or buildings.**

2.5 Selling Scottish fossil specimens and taking fossils from the UK

In accordance with the law, in order to sell fossil specimens collected in Scotland, for example by means of the internet, a vendor requires to obtain full legal title to the specimen from the owner. The owner might be the owner of the land but sometimes title to fossils (usually under reference to “mineral rights”) will have been reserved to a previous owner of the land, so care should be taken. This requires communication between the collector and owner with agreement on title transfer.



- **“Having ownership title to a fossil means it may be sold lawfully.”**

The United Kingdom Government retains customs powers. Under the existing system controlling export from the UK, licences can be refused or deferred for certain categories of ‘cultural objects’ of special historical, aesthetic or scholarly importance (includes palaeontology), usually to provide an opportunity to UK-based institutions to buy the object.

The system for export licences is administered by Arts Council England (ACE), on behalf of the UK Department for Digital, Culture, Media & Sport (DCMS). Export licenses can apply to palaeontological material exported both permanently and temporarily (for example for display or scientific research).

- **Those intending to export Scottish fossils from the UK should check the current situation regarding export legislation.**

This brief guidance does not cover:

- General customs regulations and laws, for example on false declaration of goods.
- Special issues concerning stolen and other illicitly collected fossils (for instance, export of such fossils from the UK may be illegal depending on the cultural heritage laws or international treaties of the state of destination).
- Import of fossils into the UK.



2.6 Buying Scottish fossil specimens

Many collectors, and museums, purchase fossil specimens to add to their collections. This may be to gain more examples of a particular group of fossils, to obtain material from classic localities, to acquire material for scientific research, or to provide material for displays.

There are several factors to bear in mind before making a purchase:

- Is the seller the legal owner of the specimen? This may be difficult to establish. If it is unclear, you could be purchasing stolen property.
- Is the specimen correctly described, and are locality details given correctly? Vague locality details (for example ‘Caithness’) are of little scientific value.
- Are the item and its data genuine? Faking is not currently believed to be a significant problem with Scottish fossils, but the buyer should be cautious,

especially if the offer is unexpectedly good. Faking is common in the fossil trade worldwide, especially in the overseas tourist souvenir market. Fossils are also often restored or made up from incomplete specimens, or inserted into new 'stone' matrix, simply to make them look better and command a higher price as décor fossils.

- Has it been well prepared? Some material offered in rock shops has been varnished, carved, repaired and polished to enhance the superficial appearance may therefore only be useful as a decorative curio.
- Be cautious of language claiming legitimacy without proof; purchasers should always satisfy themselves of ownership and provenance.

- **If purchasing a fossil specimen it is recommended that purchasers use a reputable dealer.**
- **Purchasers should satisfy themselves that a fossil for sale is genuine and has been properly prepared.**
- **Assurance should be sought that a fossil for sale has been collected legally, that the seller has legal title to sell it and that they are prepared to provide the specimen's locality details.**

2.7 What to do in the event of encountering people collecting irresponsibly

You may come across a situation where you suspect that irresponsible collecting is taking place with damage to a fossil locality and excessive fossil material being removed. For example, a crow bar, sledgehammer or rock saw being used to extract fossils from bedrock and a vehicle being loaded with broken fossil bearing-rock. If so, it may be appropriate, provided you are not putting yourself at risk, to enquire whether the person or persons has or have permission to collect fossils, and have heard of the Scottish Fossil Code. The incident ought to be reported as soon as possible to the land owner, occupier or land manager. If you consider that the collecting may be taking place illegally or you find evidence of suspected illegal collecting having taken place, for example damage at a fossil locality that is an SSSI, the incident should be reported to the police by telephoning 101 or reporting it online via the 'contact us' portal on the Police Scotland website. State that you believe a crime may have taken place and request an incident is created and titled as a 'Wildlife Crime'. You could also report by calling Crimestoppers on 0800 555 111 where you will not be asked your name and you can leave your information anonymously. The local office of NatureScot should also be contacted.

Whether you suspect either irresponsible or illegal activity a useful action would be to note down details including the date and time of the incident, an exact location or grid reference, the registration number, make, model and colour of motor vehicles in the area, description of those involved and the tools being used, but only do this if you can keep yourself safe.

- **If you encounter what you consider to be irresponsible collecting, use your common sense and do not put yourself at risk by intervening. Try to inform the land manager and, if the location is an SSSI, report the incident to the police and NatureScot as a 'Wildlife Crime'.**



PART 3: COLLECTING AND CARING FOR FOSSILS

Fossils are a limited resource and should not be taken without good cause. Once a fossil specimen is collected and removed from a fossil locality there is a responsibility to care for it. This part of the Scottish Fossil Code provides information and best practice recommendations for the collection, identification, care and storage of fossil specimens. Whatever your reason for collecting fossil specimens, be it for scientific research, recreational, or commercial reasons, this part applies to everyone.

Part 2 of the Code should be referred to regarding legal responsibilities associated with access to land and fossil collecting.

3.1 Knowing about fossils and where they are found

In order to find fossils it helps to know what you are looking for and museum collections represent a good place to start. The more you know, the more you are likely to find and recognise fossils. There are online and other publications that provide information on the different types of fossils, and the biological groups to which they belong.

- Those interested in fossils, and fossil collecting, are encouraged to learn about the fossil heritage and to visit museums to see some of the best preserved fossil specimens.

3.2 Approaches to collecting and the levels at which it is undertaken

It is important to note that our fossil heritage is there to be observed and appreciated as much as to be collected from. It is not always necessary to remove fossils from a fossil locality, to learn about and enjoy them. Taking photographs, making drawings, recording what you discover and reporting any finds, can be just as rewarding. This alternative approach to collecting could also benefit palaeontological science.

- Finding fossils to observe, appreciate or record them is an alternative approach to collecting and removing them from a fossil locality.

If removing fossils from a fossil locality it is important to be familiar with the various approaches to collecting and levels at which it is undertaken. This reflects the various interests in Scotland's fossils and the purpose of those involved in collecting. If you are able to describe the purpose and level of your collecting then that can be helpful in any dialogue with landowners, land managers and others when you are either collecting or proposing to collect at a fossil locality.

Find and observe 'collecting' – does not involve removing fossil material but instead looking for undiscovered, or already known about, fossils to appreciate and learn from them. Can involve taking photographs, making drawings, and recording other information of what you see or find. This can extend to reporting new finds.

Casual collecting – represents the irregular instance of collecting and removing a small loose individual item of rock or fossil, out of general interest and curiosity, that may be retained as a memento.

Minor collecting – involves collection and removal of a few small pieces of loose broken rock or common fossil (that could fit in the palm of the hand or smaller), that are found lying around. Minor





collecting may be carried out by research scientists, but it is more commonly undertaken by recreational collectors, young people and groups with an educational aim or for the purposes of securing and creating a small collection.

Significant collecting – represents the noticeable removal of amounts of fossil-bearing rock or fossil specimens. Significant collecting may be characterised by the excavation of rock and fossils from the solid bedrock, perhaps using lightweight hammers and chisels and/or the removal of a few kilograms of already loose rock or fossil specimens. Significant collecting is an approach adopted by scientific researchers and some serious recreational collectors building a collection or perhaps undertaking research.

Large-scale collecting – involves excavation of many kilograms of rock from bedrock and/or the removal of many kg or more in weight of already loose rock. It is associated with the use of tools and equipment such as mash hammers, sledge hammers, crowbars, pinch bars, picks, shovels, rock saws. Rarely mechanical excavators, gas-bursting capsules and explosives are utilised. Transport is required to remove fossil-bearing rock and specimens from the locality. Large-scale collecting is necessary in certain circumstances for scientific research. It is also an approach adopted by some serious recreational collectors undertaking research and commercial collectors.



- **Given the variety of approaches to fossil collecting, it may be useful to be able to describe the purpose and level of your own collecting as this could be helpful in any dialogue you may have with landowners and others.**

Section 1.9.4 outlines the issue of irresponsible collecting and the threat that poses to Scotland's fossil heritage. In the context of the various approaches to collecting and the levels at which it is undertaken, outlined here, irresponsible collecting may be defined:

Irresponsible collecting – an approach that is inappropriate for the characteristics of a fossil resource, including the circumstances in which it occurs, that causes unjustifiable damage and loss.

3.3 Collecting fossils responsibly

3.3.1 Fossil collecting and respecting wildlife

Fossil localities are usually intimately or closely associated with other features of the natural heritage. Be aware that plants and habitats can be easily damaged and that some birds and other animals can become alarmed or distressed if you do not take care. Depending on the season of the year be mindful of nesting birds on coastal cliffs, inland and quarry faces, and that some birds nest on the ground. Also be aware that disturbing soil whilst fossil collecting can lead to soil erosion affecting the biodiversity it supports.

- **Always take proper account of wildlife and other aspects of the natural heritage by following the guidance in the Scottish Outdoor Access Code.**

3.3.2 Equipment usage in fossil collecting and extraction

Hardened steel hammers and chisels, specifically manufactured for breaking rock, are the traditional hand tools of the fossil collector. In Scotland, most fossil-bearing rocks are hard and the careful use of such a hammer is necessary to extract a fossil in a proper manner. However, since many good specimens can be found by looking through loose and weathered material the use of a hammer is not always required.

- **It is not always necessary to use a hammer and chisel to find fossils.**

Hammering or chiselling exposed bedrock that is a protected geological or palaeontological feature in an SSSI risks recklessly damaging the site, as does clearing vegetation to expose bedrock within an SSSI. In both cases, a 'Wildlife Crime' may be committed.

- **Do not hammer exposed bedrock, if it is a protected geological feature, or clear vegetation to expose bedrock, within an SSSI, without first obtaining consent.**

Rock saws can be used responsibly in the extraction of fossils and for trimming excess rock from fossil specimens. However, the use of rock saws, power tools and other equipment, such as drills, mechanical excavators and tools, to extract fossils from outcrops is generally not regarded as a sustainable and responsible activity. Such activity accelerates the depletion of fossil-bearing resources and can cause unsightly damage to outcrops.

- **Apart from trimming specimens, the use of mechanical equipment to extract and remove fossils should only occur for the purposes of palaeontological research projects (for example by museums and universities) and then only when essential.**

A hand lens or magnifying glass is a useful item of equipment allowing the examination of details on fossils and associated rock. A GPS system and/or detailed maps, notebook and camera are essential items of equipment to record finds.

3.3.3 How much fossil material to take and its careful removal

At most locations where fossils are to be found there is adequate broken rock lying around from which to collect. However, it is important to consider carefully your reasons for collecting and the vulnerability of the locality to fossil extraction as fossils are a limited resource and should not be taken without good cause. You should exercise restraint ensure that you do not 'over-collect' and therefore deplete the fossil resource. It is good practice to aim for a representative collection rather than many examples of the same fossil. The exception would be, for example, an academic objective of collecting specimens ranging in age (juvenile to adult) to gather data related to growth and age related changes.

- **Do not over-collect by taking many examples of the same fossil.**
- **Ensure that you leave fossil specimens that you do not want at the locality for others to find.**

A fossil in a collected rock sample can become either damaged or destroyed through the collector's efforts to reduce the size of the fossiliferous rock sample for ease of carrying and transport. The successful reduction of a rock specimen to a more convenient size, minimising risk of damage to the fossil, will require the use of appropriate equipment.

- **You should not attempt to reduce the size of a rock sample containing a fossil without the appropriate equipment.**

Remember that incomplete specimens or specimens broken during collection have scientific value, therefore it may be worth retaining them; with the broken specimens being carefully repaired.

When collecting ensure that you have a supply of packaging materials such as boxes, bags, newspaper and tissue in which to wrap specimens even if they are broken. Secure packing of specimens will help prevent them being damaged whilst being carried and during transport.

- **Incomplete specimens may be worth retaining and broken specimens may be carefully repaired.**
- **Fossil specimens should be packaged carefully for carrying and transport.**

3.3.4 Respecting other users of fossil localities

Freshly broken rock debris scattered about is unsightly and can be dangerous. Rock fragments may cause injury and are a hazard to farm animals, vehicles, and other fossil collectors. It is important therefore that fossil localities are left in a tidy condition and are not made more difficult or hazardous for animals, vehicles and those coming after you. This should include returning loose and broken material to where it was found, and not spreading rock debris on pasture, footpaths and other access routes.

- **Leave fossil localities in a condition that does not present a hazard to animals, vehicles and other collectors.**

Fossils and associated rock found at one location must not be disposed of at a different locality. This is an irresponsible action that could confuse the scientific understanding of a fossil locality, with fossils being attributed to the wrong location and rock sequence.

- **Never discard fossil material and associated rock collected from one fossil locality at a different location.**

3.3.5 Recording fossil finds

As soon as a fossil is removed from the rock and the area in which it is found, irreplaceable scientific information is lost. This can be minimised by recording basic information at the time of collection such as the precise locality and position in the exposed rock sequence. Unless this is done, with records kept permanently with the specimen, the potential scientific value of the specimen will be drastically reduced.

- **When you collect a loose fossil take a note of where it was found.**

The locality record for fossils excavated from bedrock should be precise. Try and pinpoint the precise locality, to within a few metres, by using permanent landmarks, ten-figure Ordnance Survey grid references, or an internet available geocode system.

You could sketch the outcrop and record features of the rock, including any layering (bedding) and the position in the exposed rock sequence at which the fossil is found, in a notebook. Ideally photographs should be taken of the outcrop with the location of the fossil find identified making sure there is a scale-bar in view.

- **If you remove a fossil from bedrock, record the location, and the position it was found in the rock sequence.**

3.3.6 Reporting exceptional and unusual finds

An 'unusual' fossil may be:

- A species new to science.
- A species new to the country.
- A species new to the locality.
- A particularly well-preserved specimen, possibly showing features of the animal or plant that have not been previously described.
- The oldest or youngest of a known species. Such a find may extend its fossil record considerably.

If you are fortunate enough to discover an exceptional fossil (for example a rock surface with many fish fossils, a dinosaur bone, or a reptile trackway), it is best to seek advice from a palaeontological expert and report your find. Similarly, if you encounter an unfamiliar fossil or other feature in the rock and you are uncertain what it is, or in your experience it appears unusual, you should also consult an expert. It is possible that others may already know about the find. It may be the focus of a research project, be used for educational purposes, or be waiting for collection and removal by palaeontological experts and therefore should not be damaged or collected.

- **If you discover an exceptional, large, unfamiliar or unusual fossil seek expert advice and report your find.**

Record the position of the find, take photographs and contact your local or national museum, university or the British Geological Survey. An expert will then be able to assess the find, determining whether it has already been discovered and is being used for research or education purposes. If found to be of particular significance, arrangements may be made for its extraction and removal.

- **Do not attempt to extract part of a fossil specimen as this will damage it and reduce its scientific value.**

You should consider donating scientifically important specimens to an accredited museum, or other research institution. The specimen is then available for fuller study to determine its importance and may go on public display. If it proves to be new to science, it will require a name and a detailed published description and illustration. Finders of new species frequently have their name incorporated in the name of the fossil when it is described. A permanent memorial to the finder and the fossil!



- **It is good practice to donate scientifically important specimens to an accredited museum.**

3.3.7 Identifying fossil finds

The identification of fossils is an important part of collecting. Most fossil collections are organised according to biological classification and thus some knowledge of the classification of animals and plants is useful. Some collectors will be content to identify fossils to a general level (for example fish, trilobite, ammonite), but most wish to identify specimens to genus and species level. There are many books, with fossil illustrations, that the recreational collector can use. However, only a tiny proportion of known fossils is illustrated in such guides, and help and advice from a palaeontological expert is normally required.

- **Try to identify the specimens you have found using reference books, online resources and seek expert help if required.**

The major museums, the British Geological Survey and university geology departments generally provide an informal service for fossil identification and are pleased to help collectors through offering advice. However, the staff in these institutions do not have time to identify whole collections of fossils, and are not experts in all fossil groups. Your local or national museum or university may have a specialist geological curator and be in a position to offer advice.

3.3.8 Informing land owners and land managers of your finds

It is recommended that those who have given their permission to collect fossils are informed of the results of your collecting efforts.

3.4 How to care for the fossils you collect

Fossils are a limited resource, and are irreplaceable. You should therefore take good care of them, and also of their accompanying data once they have been found and removed from the ground. If you cannot do this, then collecting fossils, or retaining a fossil collection, is wasteful of Scotland's fossil resource. Better to leave fossils for others to find, or pass them to a more suitable home.

- **Take good care of collected fossils and the information that you have recorded about your finds.**

Standards of collections care are well established for museums. Scientific researchers, serious recreational collectors and those collecting for commercial purposes should follow broadly similar standards. However, it is unreasonable to expect young people, casual and less experienced recreational collectors to follow such high standards. Nevertheless, the basic principles still apply and are to be encouraged at all levels.

A brief outline of good practice is given here. It is not possible to be more specific, as the actual standards to be expected depend on individual collectors' expertise and resources, the content and significance of their collections, as well as currently available materials and techniques.

3.4.1 Cleaning and preparation of newly collected fossil specimens

To prevent damage to the specimen, fossils or fossil-bearing rock that is wet with seawater should be rinsed and soaked for at least several hours, in clean fresh water, to remove as much salt as possible. This action will help prevent damage when salt crystallises in the pores of the specimen. Other wet material should be dried gently and slowly to avoid cracking.

Soil and other substances adhering to the specimen should be removed very gently using a brush or other tool that will neither mark nor otherwise damage the fossil. Beware that cleaning of fossils preserved in soft shales can present problems, as wetting may damage the fossil or cause it to disintegrate.

Preparation of a fossil refers to the act of removing rocky matrix surrounding the fossil enabling its use in palaeontological research or for exhibition purposes. The degree of 'preparation' required to remove rock, that obscures part of a fossil, will depend on the specimen and collector. However, in general, it should inflict no damage on the fossil specimen itself, or promote cracks, which could in time lead to more damage. In general, some rock material should remain with the specimen as it, together with any associated fossils, provides information which will probably add to its scientific value.

In the laboratory a variety of tools is available for preparing fossils. Apart from hammers and chisels, electrically powered engraving tools, air abrasives, rock saws, dental tools and a variety of chemical treatments, including acids, can be used. Safety rules must be followed in preparation techniques. It is wise to practice techniques on poor material, and to take advice before attempting the preparation of a good specimen. Specimens can be ruined by poor preparation.



- **Fossil material should be cleaned and prepared for storage and display as soon as possible after collection.**
- **If you are in doubt about the techniques and lack the necessary equipment to clean and prepare a fossil specimen, consult publications on palaeontological preparation techniques and seek expert help before attempting to work on it.**

The unnecessary use of adhesives and varnishes is not considered good practice, even to 'improve' the look of a specimen. Varnish and other types of coatings may damage surface detail and reduce the scientific value of a specimen. Coatings can deteriorate with time, and further problems may arise when they are removed.

- **Varnish should not be used to 'improve' the look of fossil specimens.**

Glues used in fixing together the component parts of a broken fossil specimen should be 'reversible', i.e. soluble in a solvent such as water, so that the joint can be remade if need be. For this reason, reactive adhesives such as 'superglue', epoxy resin and contact adhesives generally, should not be considered suitable. Archival neutral pH PVA emulsion, which is a non-reactive adhesive, is recommended for those starting collecting.

- **Use reversible glues if fixing fossil specimens.**

3.4.2 Labelling and documentation

The basic information such as where and when found, recorded when a fossil specimen is collected (see Section 3.3.5), should be carefully transferred and included on an accompanying information label. This allows for accurate data to be attributed to the specimen before the collector's memory fades.

- **Collected specimens should be labelled.**

The information on a label ideally should include:

- find locality, including National Grid Reference;
- geological horizon (e.g. rock layer or bed, geological age);
- date collected;
- specimen number;
- name of the collection to which it belongs (this may be indicated as a prefix to the specimen number);
- identification, for example genus and species (less important than find locality, horizon and collection information, as this data can be added or modified at any time);
- collector; and
- details of collecting permission, where appropriate (although collecting permission may be better filed with the collection as a whole).

Each specimen should bear a unique number written in waterproof permanent ink, ideally on a label of acid-free paper stuck with 'reversible' glue that, if required at a later date, can be detached from the specimen. Although more difficult to remove, a patch of matt white paint may also be used to allow number labelling of a specimen. Whatever labelling method is used, it should be applied to the edge or back of the rock on which the fossil occurs so as not to obscure any details of the specimen. A coat of clear varnish should be applied over the paper label or paint patch to preserve the number. This number must also be put on the accompanying data label and on any other information records, for example field notebooks recording the location of the find. Using numbers ensures that the information on the data label cannot be mixed up with that for any other specimen. It is good practice to have a running list of all your specimens and their details in a hardbound book (a register), to avoid duplication of numbers. When labelling the matching halves of a fossil on two separated sections of rock, known as the 'part' and 'counterpart', the use of suffixes is recommended.

The information should be in good quality paper form. Computers can be used to generate and process the information, but should not be used as the primary (or sole) information store. Good documentation is essential for any fossil material that is being considered for donation to a museum.

3.4.3 Storing and displaying

Your fossil collection should be organised so that individual specimens can readily be located. Specimens in most fossil collections are primarily divided and stored by fossil group. Some popular ways are:

- fossil group, then geological age;
- geological age, then fossil group; and
- geological age, then locality, then fossil group.

At the simplest level, the storage and display of fossil specimens will comprise of placing them in dustproof conditions, protected to stop them rolling around and abrading each other, for instance when a drawer is opened. A simple way to do this is to keep each specimen in its own cardboard tray, with its label, and if necessary some rolled tissue padding to stop it moving around (cotton wool is not good as it catches on specimens). At a more sophisticated level, you could use museum-quality materials such as acid-free card and tissue.

Damaging environmental conditions, such as those in an unheated garage in winter, should be avoided because of the effect of damp and mould growth on storage boxes, other packaging and labelling. Direct sunlight can also cause labels to fade and lead to problems associated with excessive drying out and fluctuating temperature.

Humidity and temperature-sensitive material (see below) may need particular care, to avoid excessively high or low humidity (the latter can happen in centrally heated houses in winter). This care extends to the maintenance of a reasonably stable temperature.

- **The storage and display environment for your fossils should not damage, or cause deterioration to, the specimens.**

3.4.4 Problems associated with conserving collected specimens

There are problems associated with the conservation of specimens in a collection. If these are not adequately dealt with they can permanently damage a specimen and in extreme cases lead to its loss.

Breakage and abrasion – are commonly the result of poor storage, and subsequent handling and not just caused through transport.

Dust and dirt – commonly accumulate through poor storage and display.

Damp – causes mould growth on specimens, especially dirty ones, and encourages insects and other pests to attack the packing and labelling.

Extremes of humidity and temperature – can damage vulnerable specimens especially if changes are rapid. Varnishing a specimen will not prevent or halt such damage and can make matters worse. It may be necessary to consider special storage conditions for important collections. Whether a given specimen is at risk from extremes of humidity and temperature depends on the mineralogy of the specimen and also the locality and source rock.

Fossil material potentially vulnerable to humidity and temperature includes:

- 'Poorly mineralised' bones from Quaternary deposits (for example mammal teeth and bones).
- Specimens in shale or clay rocks, especially those which expand and shrink with changes in humidity.
- Specimens containing some forms of the mineral pyrite, under conditions of fluctuating temperature and humidity, tend to deteriorate through pyrite oxidisation. This can result in the specimens falling apart. Specimens containing pyrite should be stored separately in dry stable conditions to try and prevent their loss and acidic vapours damaging other specimens.

3.4.5 Collection security

A collection that, for example, has significant scientific importance, should enjoy an appropriate level of physical security, and perhaps also financial insurance, against fire, flood or theft. Where appropriate, a photographic record of the collection (or at least key specimens) can help in proving the identity of stolen material and seeking to recover it, especially if it has been sold.

- **An important fossil collection should enjoy an appropriate level of physical security.**

3.5 Dealing with old and perhaps neglected collections

Old fossil collections, whether in museums or private hands, are an important part of Scotland's fossil heritage. They may be of interest and significance because of their history and personal connections, and because of scientific work done on the specimens. They may also contain specimens that are rare, and perhaps no longer collectable (for instance because the locality has been worked out or is a quarry that has now been infilled).

Unfortunately, old collections are sometimes neglected, badly stored or disordered, and they may suffer the problems mentioned above (for example covered in dirt or have suffered from pyrite oxidation). A natural reaction is to unpack, sort and wash the collection. Such action can be disastrous as this is the wrong treatment, which can damage the collection's labelling and documentation. Sorting out, assessing and reorganising an old collection, neglected or otherwise, needs special care to avoid loss of old information and the introduction of spurious new information.

If you have reason to believe that an old and perhaps neglected collection is important, you should, if possible, leave it undisturbed until you have sought advice from a palaeontological expert (for example through a specialist museum curator).

- **Seek expert advice when dealing with an old and perhaps neglected fossil collection.**

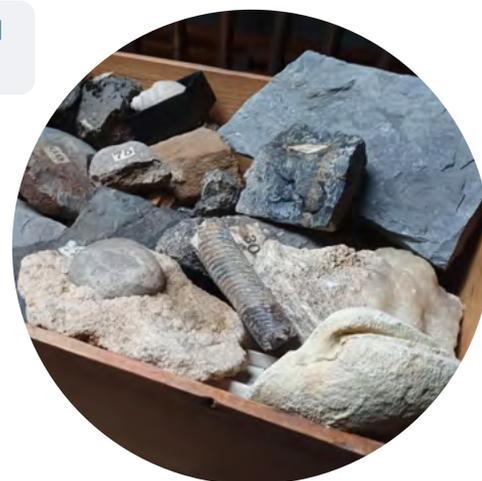
3.6 Disposing of an old or redundant collection

The method of disposal of an old or redundant collection depends on its quality. If in doubt seek advice from a specialist museum curator. If the collection is well documented and contains good specimens it may (wholly or partly) be of interest to a museum. If it is poorly documented and the specimens are generally common it may still be of interest to schools, colleges or museums to provide teaching and handling material.

- **When disposing of an old fossil collection seek advice and consider donating it to a museum or educational establishment.**

3.7 Donating a fossil or collection to a museum

If you are considering a home for your finds for the public benefit, you should choose an accredited museum (which may be operated by national or local government, a charitable trust, or a university) or the British Geological Survey. To avoid disenfranchising parts of Scotland, through removal of significant aspects of the fossil heritage to larger city centre museums, there should be consideration for donating a fossil or collection to a museum that is the most local to the location(s) where specimens were found.



A scientifically important specimen should normally go to a museum with specialist staff to care for it and arrange for it to be studied. Other specimens can be used by museums for any of the uses mentioned in section 4 of the Appendix. The museum will be especially accountable for the specimens added to the permanent collection.

- **If you are considering donating a fossil, or collection, to a museum you should choose one that is accredited and perhaps close to where the fossil or most of the collection was found.**

In order for a museum to accept your donation, you will need to demonstrate that you are the owner of the fossil, if the museum is to obtain valid title of ownership from you. You will also be asked to make the gift (or sale) an absolute one, without strings, and to let the museum deal with the find as it thinks fit.

The museum may decide not to accept your offer if your finds duplicate what the museum already has, or may not be a priority for the museum. It has to be judicious in what it acquires and stores, owing to limited resources and storage space. If this is the case the museum may well suggest another museum better suited for your finds. Different museums have different priorities and an accredited museum will have an acquisition policy, often on its website. National and university museums tend to be particularly interested in scientifically important fossils. Local authority and local trust museums tend to be more interested in fossils from their geographical area of coverage.

It was once common to place fossils from private collectors on 'long loan' to museums, however, this is no longer good practice. The museum has the cost of housing and insuring the fossil without being able to deal with it properly. In addition, the museum cannot plan for the future if the fossil may be removed at short notice. Therefore museums need to own collections when they accept responsibility for them. It is however quite proper for the museum to borrow a fossil for an agreed short-term period, typically for an exhibition, identification, research, or to enhance a display.

3.8 Bequeathing a collection

If you are the owner of a significant private fossil collection, you cannot usually expect your family or executors to know what to do with your collection in the event of your death. Thought should therefore be given to its long-term future with instructions left in your Will. Instructions should be sufficiently flexible to allow for changing situations (for example the policies of particular museums), and for the fact that museums may not accept an entire collection, or may use some of it for exchange or as handling material (see Section 4 in Appendix). Sometimes it is best to deal with the matter yourself while you are still able to do so drawing upon the recommendations in section 3.7.

- **If you are the owner of an important fossil collection, thought should be given to its long-term future with instructions left in your Will.**



PART 4: ADDITIONAL INFORMATION AND BEST PRACTICE RECOMMENDATIONS FOR LAND OWNERS, LAND MANAGERS, RESEARCHERS, RECREATIONAL COLLECTORS INTERESTED IN RESEARCH AND OTHER GROUPS

This part of the Scottish Fossil Code provides additional information and best practice recommendations in fossil resource management and the collection and treatment of fossils. It is intended for land owners, land managers, scientific researchers, recreational collectors, specialist groups and others with a particular involvement in Scotland's fossil heritage including promoters of aspects of the fossil heritage and fossil collecting.

4.1 Owners of mineral rights and land managers

If you own the mineral rights for your land it is very likely that any fossil-bearing resources that occur are your property. The resource can be thought of as the rock layer or layers in which fossils occur. You are encouraged to find out about the fossil resource including its extent on your land, the particular fossils it contains, their age, their rarity and the importance of the fossils to science and education. This knowledge will guide the appropriate management and use of the fossil resource, including its conservation, if that is required.



- You are encouraged to find out about the fossil-bearing resource on your land and to conserve it through appropriate management.

The attractiveness of a fossil resource to fossil collectors, whatever their particular interest, influences how a fossil resource is managed from the perspective of collecting. It is important, if you can, to establish the level of fossil collecting the resource can sustain without it becoming 'worked-out' and effectively destroyed.

A general approach to fossil locality conservation may be to ensure that loose fossils are safeguarded through encouraging responsible collecting without hindrance, rather than letting them continue to be damaged and destroyed through natural weathering and erosion. Should a fossil discovery of major palaeontological significance be made on your property you are encouraged to help facilitate its excavation and removal for scientific research and public display. You may wish to donate the specimen to an accredited collection allowing its research and public display.

- You are encouraged to show sympathy to the interests of collectors.

If fossil collecting is being proposed or is already happening on your land it is useful to be aware of the various approaches to collecting, and levels at which it is undertaken, as outlined in section 3.2. In most cases the people interested in collecting fossils from your land will be recreational collectors and young people collecting on a casual or minor-scale. The fossils may also be of interest to research scientists. If the fossils on your land are particularly sought after commodities then they could be a focus for commercial exploitation.

- Be aware that there are a variety of approaches to fossil collecting and also the levels at which it is undertaken.

Fossil collectors may contact you seeking permission to access and collect in advance of collecting on your land. However, it is important to recognise that collectors may turn up on your land to collect fossils without contacting you, beforehand, probably for the simple reason they do not know who to ask. **If your land has protection status as an SSSI that has an important bearing on the character of the fossil collecting permissible (see Section 4.1.1).**

- Be aware that collectors may not know who to request permission from to collect fossils.
- If collectors are encountered, who are in ignorance of the Scottish Fossil Code, then you should bring it to their attention.

Signs of fossil collecting vary depending on the nature of the fossil-bearing rock type. Excavated freshly broken rock in heaps close to, or scattered around, a rock exposure, which may have marks consistent with being hammered or chiselled, usually indicates significant collector activity. There may also be rock-saw cut marks which could indicate large-scale collecting that could potentially have damaged the fossil resource. **It is important in this context to understand the nature of the fossil resource and to be able to appreciate what could constitute damage.**

If you come across, or find signs of, collecting that you have not given permission for and that you consider is irresponsible, causing damage to your property, or you suspect theft, then you may wish to take appropriate action. Whatever you decide to do may depend on whether or not damaging irresponsible collecting is an isolated incident or there are repeated instances and if numerous members of the public, or particular individuals, are involved. Erecting signage that discourages collecting could help prevent future instances of damage to a fossil resource.

- You may wish to take appropriate action if you suspect that irresponsible collecting activity has damaged a fossil locality on your land

4.1.1 Owners and land managers of fossil localities protected as SSSIs

If you are an owner of a fossil locality that is a SSSI the guidance above concerning the appropriate management of fossil localities, including fossil collecting, applies to you. However, with SSSIs the management of the fossil resource requires particular and careful consideration.

Generally, casual and minor collecting activity, as outlined in section 3.2, does not damage notified SSSI features, and the choice is entirely yours to permit such collecting. However, if the list of Operations Requiring Consent (ORCs) for your SSSI includes “Removal of geological specimens, including rock samples and fossils” (Standard Ref. No. 25), unless you already have consent for this from NatureScot, you are required to obtain consent from NatureScot to permit collecting of geological samples even if it’s casual collecting. Significant and especially large-scale collecting, as outlined in section 3.2, is more likely to damage notified SSSI features and to require you to obtain consent from NatureScot to allow such collecting to be undertaken. ORCs involving the removal of loose material, such as numbers 20 and 24, may also apply for significant and large-scale collecting.

Where casual and minor collecting will not damage the notified SSSI feature it is suggested you might allow researchers, recreational collectors and groups of visitors such as a geological society, and young people, to visit and collect fossils.

It is also recommended that you ask them:

- who they are;
- what the purpose of the collecting is;
- if they are aware of the Scottish Fossil Code;
- not to excavate or hammer bedrock; and
- to let you know if they discover rare or unusual fossils.

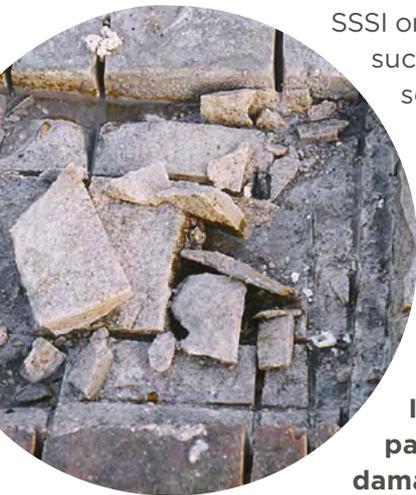
In granting permission to access and to collect fossils, you may wish to set some conditions, such as:

- a restriction on equipment used; and
- being informed of what is found.

If you encounter people collecting fossils from an SSSI on your land, who have not requested permission, then it is recommended you respond in accordance with the purpose and level of collecting and the consent process for the SSSI. For casual and minor collecting that is not damaging the SSSI features, you may choose to permit collecting or not as you see fit. However, it is recommended that you are sympathetic to minor collecting by researchers, recreational collectors and educational groups.

- **It is recommended that your response to those seeking permission to collect fossils from your land, and those encountered on your land that have not sought permission, should depend on the purpose and level of the collecting and the consent process for the SSSI.**

Public bodies should apply directly to NatureScot for consent (see Section 2.4.1), but still need your agreement to excavate and remove fossils from the SSSI on your land. You may permit collecting by public bodies such as universities and some museums, providing they have secured their SSSI consent from NatureScot. If however an individual university researcher has not applied to NatureScot for consent, you may still allow them to carry out minor collecting as described above. If they wish to undertake significant or large-scale collecting and cannot produce a relevant consent it is recommended that you contact NatureScot for advice before allowing them to approach the SSSI on your land.



It is important to the conservation of our shared palaeontological heritage that collectors are not damaging SSSI features.

This is particularly the case if they are undertaking significant or large-scale collecting or excavating bedrock, as this could constitute the offence of 'reckless damage' to an SSSI. A significant level of collecting is usually undertaken for research purposes with good scientific justification. Some researchers and commercial collectors, particularly those from outside Scotland and from outside the UK, may be unaware of the Scottish Fossil Code, and the legalities of land ownership and collecting, and may unwittingly act irresponsibly causing reckless damage to the fossil resource and the SSSI.

If you encounter collectors undertaking significant or large-scale collecting from an SSSI on your land, which you believe may constitute reckless or intentional damage to the SSSI features, and therefore a 'Wildlife Crime', you are encouraged to contact immediately both the police and NatureScot. Be careful not to touch or move any equipment or other objects that may have been left, or otherwise disturb the scene, as it could form the basis of a criminal investigation.

- **Be aware that irresponsible collecting can damage a fossil resource and constitute the offence of 'reckless damage' to an SSSI.**
- **You should contact the police if you suspect that irresponsible collecting activity has damaged the SSSI.**

4.1.2 Those that live in close proximity to a fossil locality

If you live in close proximity to a fossil locality and have an interest in the fossil heritage, but do not have any management responsibility for the site, you may wish to keep a watchful eye over the fossil resource. You may also wish to familiarise yourself with the terms casual, minor, significant and large-scale collecting set out in section 3.2. If you suspect irresponsible collecting activity that may have damaged the fossil-bearing resource you could take action in accordance with the recommendations in section 2.7.

4.2 Recreational collectors interested in research

The 18th and 19th century pioneers of palaeontology were, by today's standards, almost all recreational collectors. Even today, geology and palaeontology remain accessible to all and this provides a great opportunity for highly informed hobbyists to continue to make significant contributions to palaeontological research. As a recreational collector, with an interest in research, you may have the opportunity to work on and study a particular fossil locality or area of special interest and consult research publications on a topic. In time, you may develop considerable knowledge of this special interest, and such detailed knowledge can yield important new information or highlight gaps in existing research.

4.2.1 Working with other recreational research collectors and sharing your knowledge

It is important to share the knowledge gained through collecting and to cooperate and work with other collectors. There are few organised clubs, including those online, that cater for fossil collectors, so it is useful to form a small group of collectors with similar interests. Excursions can be organised to localities, and finds shared, discussed and appreciated. Sharing your knowledge may also be achieved for example by giving a talk at a school or club, showing others your fossil collection, or organising a display of your collection. At such educational events you will have the opportunity to encourage others to take an interest in fossils, the local geology and responsible fossil collecting.

- **You could share your fossil collecting knowledge and news of finds with other collectors, arrange visits to fossil localities, show your collection to others and encourage others to take an interest in Scotland's fossil heritage and responsible collecting.**

4.2.2 Working with professional researchers

If you have an interest, for example, in taxonomy (classification of organisms) or the ancient environments in which the organisms, that gave rise to the fossils, lived you may collect material or gather data that is of scientific value, and worthy of publication. Publication is the main way in which scientific information is made public and some recreational researchers attain a level of knowledge and skill that enables them to write magazine articles and publish papers in scientific journals. However, cooperation and collaboration with a professional palaeontologist working in a museum or university is another and often quicker way to publish your finds, and is a better strategy for most recreational research palaeontologists.

- **If you undertake palaeontological research, consider working in collaboration with a professional palaeontologist.**

It is relatively straightforward to find out to whom an approach should be made at a university, the British Geological Survey, or one of the museums. Successful collaborations of this nature are common in palaeontology and the levels of achievement and subsequent rewards to the recreational researcher can be significant and satisfying. If you wish to participate in research it is essential to attain the best standards advocated in the Scottish Fossil Code. This includes ensuring that data recording and labelling is appropriate for research and the accessioning of specimens to museum and other institutional collections.

4.3 Commercial collectors and dealers

In the business of commercial extraction and sale of fossils, the roles of Commercial Collector and Fossil Dealer may be defined as:

‘Commercial Fossil Collector’ – someone whose income is obtained partly or wholly through the employment of themselves and/or others in the physical collection of fossils and their sale.

‘Fossil Dealer’ – buys, sells or exchanges fossils originally collected by others not directly in their employ.

These roles are frequently combined.

4.3.1 Resource selection and the discovery of new fossil localities

As a commercial collector you should ideally be involved in identifying new locations for collection rather than seeking permission to further reduce the reserves at known localities that already have statutory protection as SSSI. Be aware that large excavations may require planning permission from the appropriate authority and that terms for the extraction and sale of fossil material will have to be agreed with the owner of the mineral rights and other land managers.

- **You must agree terms for the commercial exploitation of a fossil locality with the owners or their representatives.**

Newly discovered localities producing notable fossils should be worked in close liaison with museum, university-based or British Geological Survey palaeontologists. Working in this way will allow a co-operative and sympathetic partnership that will best serve the commercial, scientific and natural heritage interests. All parties, and Scotland’s fossil heritage, can benefit greatly from such co-operation.

For the benefit of both science and education, efforts should be made to work with landowners and the local geodiversity conservation group to document and determine the feasibility of conserving fossiliferous sections produced through large-scale excavation.

- **In partnership with others, you should consider the documentation and conservation of new exposure.**



4.3.2 Systematised collecting and information recording

The commercial exploitation of fossil localities should be well planned and undertaken responsibly and systematically. This should entail the keeping of accurate records of the rock layer sequence exploited, important in any future research work conducted on the fossil specimens. A photographic record of the work and a written account should be lodged with the landowner and owner of the mineral rights for posterity and with the local museum.

- **Documentation including locality information should accompany specimens that are marketed.**

4.3.3. Ownership of fossils extracted for commercial purposes and selling exceptional fossils

Given the scale and frequency of commercial collecting it is almost inevitable that exceptional and unusual fossils (see Section 3.3.6) will be found. Such fossils are invaluable for the advancement of palaeontological science and ought to be secured within a curated permanent collection, within an accredited museum in Scotland (see Section 3.7), where they are available for research purposes. There may be some fossil locations where access and collecting permission is given on condition that scientifically important specimens will, in the first instance, be offered to museums.

- **You should offer finds of exceptional fossils to an accredited local or national museum in Scotland for donation or possible purchase on the nation's behalf, before considering other museums and the open market.**

Commercial collectors will require the owner of the fossils (typically the owner of the mineral rights to the land on which the fossils are collected) to transfer ownership of any fossils before the collector can lawfully sell them.

- **Lawful sale of collected fossils requires ownership transfer typically from the mineral rights owner.**

4.4 Professional palaeontological researchers

Palaeontological research requires a resource of fossil material with which to work. However, if you are collecting for research purposes you have a duty to collect responsibly to ensure the sustainable use of the fossil-bearing resource to enable the continuation of future research. No researcher has the right to 'dig out', in other words, remove in its entirety, a fossil-bearing resource. Research collecting of a particularly limited fossil-bearing resource should adopt a multidisciplinary approach across various palaeontological and geological disciplines. This approach will minimise the impact of excavation and thereby maintain resource viability for future research.

- **You should strive to minimise the quantity of material removed and the amount of damage undertaken at a fossil locality.**
- **Research collecting from particularly limited fossil-bearing resources should be multidisciplinary.**

You should also contribute to the conservation of the fossil resource, through detailed fossil provenance recording, curating the material you collect. Effort should be made to maximise use of fossils already held in museum, university and British



Geological Survey collections. Searches should be undertaken of specimen databases for existing specimens and collections of material from a particular fossil locality. By doing so, present and future researchers can use existing collected and curated material and associated information, without having to resample a location's diminishing resource. Your responsibilities also extend to becoming familiar with the best means of preparing and preserving fossil samples.

Use should also be made of the skills, experience and knowledge of recreational researchers and commercial collectors if appropriate safeguards and checks are in place.

- **Maximum use must be made of fossils already held in existing collections, using only curated material for research that is to be published.**
- **Collected research material should be curated in a museum or British Geological Survey collection.**

You should ensure that rock faces are not disfigured with core holes and permanently engraved or painted numbers or symbols, especially in aesthetically sensitive locations. Effort should be taken to restore or/and disguise areas of rock face or loose blocks where there has been extensive sampling and excavation work to remove important fossil material. This not only has aesthetic benefit but is less likely to attract the attention of other collectors to your research locality.

- **The Geologists' Association's *Geological Fieldwork Code* should be adhered to.**

Fostering good relations with those that have given their permission to extract, collect and retain fossil specimens, should include offering copies of any resulting publications and, if appropriate, duplicates of fossils to show other visitors.

As a university or museum employee your institution may be considered as a public body which has implications for collecting in SSSI and the associated consents process. In this situation landowners are not expected to apply to NatureScot for consent to allow collecting by university or museum-based researchers to go ahead. Instead research collectors are required to secure consent directly from NatureScot. However, in addition, researchers are also expected to make contact with the landowner for their permission to collect and remove fossils.

- **University or museum researchers approaching NatureScot for SSSI consent to collect and remove fossils require landowner permission as well.**

4.5 Quarry operators, managers and developers

If you operate, manage or work a quarry from which fossiliferous rock is extracted, you are encouraged to find out about any fossils that are to be found there. Any unusual or rare fossils uncovered during quarrying should be set aside and the local museum, university or the British Geological Survey alerted to enable scientific study and collection (see Section 3.3.6).

- **Any unusual or rare fossils uncovered during quarrying should be set aside and experts in palaeontology alerted to enable scientific study and collection.**

Sympathy should be given to the interests of hobbyists, researchers, commercial collectors and educational groups in granting access to the land for collecting. Those given access and collecting permission should be encouraged to collect responsibly and follow the Scottish Fossil Code. Close working and co-operative arrangements may be fostered between quarry operators and staff and those with an interest in fossils exposed by quarrying. Collaboration can be of benefit to all, and the fossil resource.

If following the cessation of quarrying, after-use proposals include infilling, efforts should be made to maximise opportunities to rescue any fossil resource and associated data which would be lost by infill of the site. In addition, efforts should be made, when planning and undertaking site restoration, to conserve the most important areas and faces in a stable and safe condition to facilitate future research, fossil collecting and use of the site as an educational resource.

4.6 Collectors from outside Scotland

Fossil collectors from outside Scotland must be aware of the legalities of fossil resource ownership, and the SSSI system of palaeontological resource management, when planning and undertaking collecting visits to Scottish fossil localities (see Sections 2.1 - 2.6 inclusive) particularly the paragraph on signage in Section 2.4.1.

- **Collectors from outside Scotland have a responsibility to collect fossils in accordance with Scottish law.**

4.7 Those that promote awareness of the fossil heritage

The geological and palaeontological heritage of Scotland is justifiably celebrated and promoted having significant educational, awareness-raising and tourism value. Books and Internet sites and pages highlight aspects of this heritage with some having a national, regional or locality-based focus. Interpretative panels and leaflets, associated with nationally and locally important fossil localities, highlight famous and particularly interesting or significant finds and their geological context. Local community effort can include setting up and maintaining a display of fossils in a public building. Particularly celebrated fossil localities, that become particularly well-known and accessible, may be the subject of large group visitation for educational and tourism purposes. These and other activities, that interpret and promote the fossil heritage, however, come with responsibility to ensure that information or advice provided does not give rise to irresponsible collecting and collector pressure on vulnerable fossil localities.

4.7.1 Operators of websites that promote fossil localities and fossil collecting

Websites that promote fossil localities and fossil collecting can represent a useful resource, providing general geological information, illustrating fossil material and detailing information specific to particular fossil localities. They may have an associated club that organises field trips or fora through which experiences of collecting may be shared. However, promotion of the palaeontological heritage of Scotland via Internet websites should be undertaken in a responsible manner. Every effort should be made to ensure information supplied is accurate, does not encourage exploitation and damage to SSSIs and fossil localities generally

- **Websites that promote fossil locations in Scotland should encourage responsible collecting, request adherence to the Scottish Fossil Code and carry a link to the Code on NatureScot’s website.**

4.7.2 Interpreters of the fossil heritage and authors of guides and other publications aimed at the general public

Raising awareness, interest, and understanding amongst local people and visitors, of the local geological and fossil heritage, including fossil localities, is an activity pursued by individuals and groups across Scotland. There are many ways this is undertaken including:

- producing interpretative materials such as leaflets and on-site panels;
- creation of a website or using other on-line media;
- organising local talks and planning open days and activities for families;
- preparing displays of local fossils; and
- preparing press releases and engaging the media.

Promoting local palaeontological assets can benefit local communities through attracting visitors and having educational value. Such effort can also encourage interest in geodiversity and nature generally. However, the planning and execution of efforts to advertise or encourage an interest and engagement with the fossil heritage should ensure that information supplied is accurate and does not encourage damaging exploitation of the fossil heritage being interpreted and promoted. This should include reference to the Scottish Fossil Code in interpretative products, media posts, guides and displays.

Similarly the authors of publications that either have a palaeontological subject matter and association, or mention fossils or fossil localities in the wider national context, should make reference to the Scottish Fossil Code. This is particularly the case if there is encouragement for readers to visit fossil localities.

- **Efforts to raise awareness and promote the palaeontological heritage, or aspects of it, either locally or nationally, in publications and any interpretative products such as panels and leaflets, should make reference to the Scottish Fossil Code.**

4.7.3 Leaders of field parties for education or tourism

Many locations in Scotland that are important for their fossil heritage attract groups such as geological societies, and university and school study parties, largely for educational purposes. Some Scottish fossil localities are also destinations for ‘geotourists’. With the attention of many potential collectors focussed on an area, perhaps at regular intervals over time, a vulnerable fossil locality may be at threat from over-collecting.

It is essential therefore that in leading an educational group an individual, tourism business owner or organisation ensures that the spirit of the Scottish Outdoor Access Code (SOAC) and the Scottish Fossil Code is upheld by demonstrating and encouraging good practice in accessing fossil localities and in all aspects of collecting and data recording.

- **Group leaders should demonstrate and encourage good practice in accessing fossil localities and in all aspects of collecting and bring the Scottish Fossil Code and the Scottish Outdoor Access Code to the attention of group members.**
- **Be aware of any restrictions at any fossil location(s) visited and the threat to localities from over-collecting.**

4.7.4 Those wishing to set up a local museum or permanent display

Those who seek to promote and safeguard their local fossil heritage may feel it necessary to set up a publically available permanent display or museum if no local museum deals with fossils or provides a public service. The Scottish Museums Council provides valuable advice and guidance that will help you think about what you really want to do, and can realistically achieve.

Where appropriate and practical, loans from museums such as the National Museums Scotland may be organised. Clearly, if you want to display borrowed fossils in a visitor centre, then that means an appropriate degree of security and insurance cover will also be required.

- **Seek expert advice if setting up a publically available permanent display of local fossils.**





APPENDIX: THE ROLE AND VALUE OF SCOTLAND'S MUSEUM AND OTHER PUBLIC COLLECTIONS

The main museum gallery of The Hunterian, University of Glasgow – Scotland's oldest public museum contains some of the earliest fossil and rock and mineral collections from Scotland. © Neil Clark, The Hunterian.

Many Scottish fossils are held in public museums. Museums are important places for the public to see, learn about and handle fossils. They are also important for palaeontological research, and have a role in tourism and encouraging the wider public understanding of Scotland's fossil heritage. Museums are important for preserving the information about specimens just as much as for the specimens themselves. Given their importance, this appendix to the Scottish Fossil Code concerns collections in Scotland and fossil donations to museums.

1. The nature of fossil collections

As an important resource of our geological heritage, fossils in museum collections must be looked after, just as much as new finds. Old museum specimens and new finds complement each other. Older finds are often the only evidence of fossils from quarries and fossil locations that are now worked out or infilled. They may also be historically interesting. Newer finds tend to have more complete information and to have been collected with more modern techniques.

Fossils in private collections are not normally publicly accessible; in the long run, well documented private collections often end up in museums, whose collections frequently grow more in this way than by direct field collection. The collections of Scottish fossils in National Museums Scotland include vast and important collections which initially were in private hands, but which are now part of the National Collections and are available for study.

2. Museum Accreditation

Museum accreditation is a voluntary quality assurance scheme for museums across the United Kingdom. It was formerly known as the Museum Registration Scheme. It recognizes that a museum conforms to, or is working towards, basic nationally agreed standards of collections care and documentation, organisation and management, and services to users. In particular, it helps safeguard the collection if the holding institution is dissolved (for example goes bankrupt). Accreditation is increasingly used as a benchmark by funding organisations (for instance, the National Heritage Lottery Fund).

3. Museum services in Scotland

Different museums are run in different ways and with different priorities as regards fossils. Many museums have collections and perhaps also displays of fossils, but only some have specialist curators such as geologists or palaeontologists on their staff, or as volunteers. In other words, not all museums, even those with fossil collections, have people with a wide knowledge of fossils.

The Scottish Fossil Code 'Further Information' pages on the NatureScot website provides a link to information on Scotland's Fossil Collections housed in museums and elsewhere. Most have displays of fossils (allowing for closures and renovations), although not all will have palaeontologists on their staff at any given time.

Museums with small collections are not listed for practical reasons, but that does not mean that their collections are not useful. Some, such as the Hugh Miller Museum at Cromarty, and the National Mining Museum Scotland at Newtongrange, hold interesting fossil collections in support of the broader aims of the organisations.

Scottish fossils are also held by museums in other parts of the UK (for example the Natural History Museum in London) and abroad. This is testimony to palaeontology being an international science.

3.1 National Museums Scotland

Scotland's national museum service is National Museums Scotland, which is partly funded by the Scottish Government. It has an important national fossil collection of its own and displays fossils to the public at its museums and by loans to other Scottish museums. It has specialist palaeontological staff experienced in the study and research of fossils, and in their interpretation to the public. National Museums Scotland collects its own finds of fossils, as well as those found by others and also offers advice, expertise and co-operation to the museums community across Scotland.

3.2 University museums

University museums include The Hunterian at the University of Glasgow, which collects fossils from all over the world. The Hunterian has specialist staff experienced in the study and research of fossils, and in their interpretation to the public.

3.3 Local museums

Many local museums, run either by local authorities or independent trusts, have fossil collections. Local museums tend to focus on a particular geographical area, although they will sometimes have fossils from elsewhere in Scotland and beyond, to complement their local fossils.

Many local museums have geological collections, perhaps acquired long ago. Only some have specialist staff in the natural sciences including geologists or palaeontologists, but they provide a valuable service over much of Scotland.

3.4 British Geological Survey

The British Geological Survey (BGS) holds a major collection of Scottish fossils palaeontological slides in its Edinburgh office including type fossil examples. Access for bona fide study is available by appointment or loan, and public displays form part of BGS Open Days. It has experienced geologists available to answer enquiries from the public. The Survey also holds significant collections of Scottish fossils at its headquarters in Keyworth, Nottinghamshire, and these are also available for study by appointment. Internet access to the collections database is available on the BGS website.

3.5 Scottish Museums Council

The Scottish Museums Council (SMC) is the membership organisation for museums and galleries in Scotland. It provides advice and funding from the Scottish Government to all museums (except for National Museums Scotland which is directly funded) but does not offer specialist advice on collecting objects, and does not take a direct role in dealing with fossils.

4. The use of fossils in museums

Museums usually add new specimens to their permanent collections for one or more of the following reasons:

Display – the fossil is an especially good, complete and clear example, which will enhance a display. Only a small proportion of fossils in a museum will be on display. The majority are usually in storage. Some are unsuitable for display purposes but are held for reference and research. Many may go on display in the future, as permanent and temporary exhibitions change.

Local provenance – the fossil helps build up a representative collection of finds in the geographical area of especial interest to the museum.

Study and research – the fossil is interesting to palaeontologists, for example because it is evidence for the occurrence of a particular organism at a particular place and time, or because it shows certain features of the original animal. The most important specimens are those that have been cited in papers published in scientific journals. This reflects partly their inherent scientific value, and partly the importance which publication confers. Good science demands that work can be repeated by other scientists, thus scientists must be able to examine published specimens. Therefore it is especially important that such specimens are permanently placed in public collections. Specimens which are simply mentioned or discussed in publications are called **cited specimens**; **figured specimens** are more important, as they have been illustrated in publications; most important of all are **type specimens** – those which are the defined reference specimens for a species or genus of animal, plant or microorganism. On these rest all classification, and therefore all palaeontology.

Teaching – where fossils are abundant or critical in helping students understand the uses, preservation, and meaning of fossils. If the fossil is rare, but an important teaching tool, it is sometimes moulded and cast to allow more students an equal learning opportunity.

Historical importance – the fossil was found, or is otherwise associated with, an interesting historical figure, perhaps a famous scientist or author, or a local collector.

Handling and exchange specimens – these specimens are not registered in the permanent collections but provide a really worthwhile service, used for handling by school parties and visitors, or loaned out to schools. They are inevitably relatively prone to damage and loss in a way which would be unacceptable for the permanent collections. Exchange specimens are saved for swapping with collectors and other museums, or for giving out to schools for them to keep.

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Complete Ordovician trilobite fossil from Girvan, Ayrshire. Width of view 2 cm. © Colin MacFadyen/NatureScot.

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9 Water Quality

9.1 Introduction

The Staffin Community Harbour development is located within an existing harbour and therefore works will be carried out in and adjacent to the sea. In addition, works will also take place at the Lealt Borrow Pit, in an already modified landscape. It is important to ensure pollution control measures are in place to protect the surrounding environment from potentially harmful impacts which could be caused during construction.

9.2 Legislation

Fuel oil and hazardous materials will be stored on site for refuelling construction plant and equipment. Storage of these materials is required to comply with different levels of authorisation.

In this instance, fuel oils are required to be stored under Generally Binding Rules (GBR's) 26 and 28 under The Water Environment (Controlled Activities) (Scotland) Regulations 2011 as amended, and hazardous materials are required to be stored in compliance with the Control of Substances Hazardous to Health (COSHH) Regulations 2002.

9.3 Mitigation

9.3.1 Surface Water Management

Onshore construction activities must not have a significant impact on the water environment. Under Condition 4 of Planning Consent 21/04525/FUL, a Surface Water Management Plan is required. The Surface Water Management Plan relates to works undertaken at the Lealt Borrow Pit only and is provided in Appendix 9A.

9.3.2 Fuel Storage

Fuel will be stored to prevent any spillages into the water environment at both the harbour and Lealt Borrow Pit sites. Should a spill occur, the Pollution Prevention Plan detailed in Appendix 9B should be followed.

Where fuel is stored, and plant is refuelled the following will apply:

- Fuel storage should be under strict management controls and compliant with SEPA's GBRs 26 and 28.
- A suitable double skinned bowser or tank (or bunded tank) will be utilised for fuel storage.
- Where practicable, the bowser or tank will be situated at least 10m from the water or nearest drain and protected from collision risks.
- Where oil is stored in a container, the container must be of sufficient strength and structural integrity, and, installed so as to ensure that it is unlikely to burst or leak in its ordinary use.



- Containers must be situated within a secondary containment system which have a capacity of no less than 110% of the container's storage capacity, or if there is more than one container within the system, of no less than 110% of the largest container's storage capacity.
- The distribution hose will be fitted with a shut off type filling nozzle.
- The filling nozzle will be fitted with a security lock to prevent unauthorised use.
- A drip tray will be provided below the distribution hose and nozzle when not in use.
- A fuel accountancy system will be employed.
- All refuelling will be carried out in accordance with site procedures by trained personnel in a designated area.

9.3.3 Hazardous Material Storage

Hazardous materials will be stored to prevent any spillages into the water environment at both the harbour and Lealt Borrow Pit sites. Should a spill occur, the Pollution Prevention Plan detailed in Appendix 9B, should be followed.

Where hazardous material is stored on site, the following rules will apply:

- All oils and chemicals will be subject to Control of Substances Hazardous to Health (COSHH) assessments under the COSHH Regulations 2002.
- COSHH assessments will include a section of the environment to highlight any specific precaution or mitigation requirements relevant to the site.
- Storage cabinets for COSHH items will be appropriately banded.
- The COSHH store will be locked, access will be controlled, and an inventory of materials stored will be maintained.

Where practicable, biodegradable hydraulic fluids will be utilised in machinery.

9.3.4 Sediment Loading

There is a potential for increased in sediment loading in the water column during the placement of material for land reclamation works and in the construction of the new breakwater. Visual checks of water quality will be carried out to ensure that any visible plumes are localised and disperse quickly. If increases in sediments are not as predicted, the construction technique will be reviewed to identify areas for improvement to prevent reoccurrence.

9.3.5 Pollution Prevention Plan

A Pollution Prevention Plan is included in Section 9B.

9.3.6 Provisional Oil Spill Contingency Plan

A Provisional Oil Spill Contingency Plan for use during the operational Phase of the Staffin Harbour Development has been produced and is included as Section 9C.



Appendix 9A – Water Management Plan; Lealt Borrow Pit

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1 Scope

Dalglish Associates Ltd (DAL) has been commissioned by Staffin Development Trust to prepare a Water Management Plan (WMP) for the operations at Lealt Borrow Pit project, as required by planning condition.

This WMP covers the requirements of Condition 4 of Planning Permission 21/04525/FUL, as follows:

"No development or work shall commence until a Water Management Plan has been submitted and agreed in writing by the Planning Authority in consultation with SEPA. The water management plan shall include the following:

- *details of all the expected potential contaminants i.e., fuel, oil, suspended solids;*
- *details of all works around watercourses (CAR Practical Guide) etc;*
- *details of all discharges of surface water from the site (as covered by GBR10 CAR Practical Guide);*
- *draining the excavation void shall be via natural infiltration or directed to a sump for re use/discharge into a minor watercourse. Any discharge into the minor watercourse will need to comply with GBR10 CAR practical Guide and so the sump will need to be big enough to allow suitable settlement to occur. Additional mitigation measures may be required.*
- *Abstraction from the excavation void (likely to fall under GBR15 CAR Practical Guide);*
- *details of the drainage surface water drainage for the road into the site;*

Thereafter the development shall be carried out in accordance with the details approved."

This WMP is a working document which will be updated, as necessary throughout the life of the development.

2 Basic Principles

The underlying principles that shall be employed in the management of water on the site includes:

- Interception of clean surface water run-off from land outwith the site;
- The provision of sump/settlement facilities to control drainage, where required;
- Regular inspection and maintenance of all cut-off ditches and settlement facilities to ensure they are in good working order; and
- The promotion of vegetation growth on restored areas and soil storage mounds to prevent erosion and reduce entrainment of suspended solids.



3 Surface Water Management

3.1 Existing Site Drainage

The Borrow Pit is located within the Lealt River catchment. The main stem of the river is 11.3km in length. The coastal water immediately east of the Borrow Pit is the Sound of Raasay, this coastal water body covers 173.7km².

The existing surface water drainage at the Borrow Pit is illustrated in Drawing 73.17.01. The site and surrounding area can be split into two sub-catchment areas (labelled Sub-Catchments A and B).

Sub-Catchment A comprises the main historic hard rock quarry void. Incident rainfall and any minor groundwater seepages are collected within the void, whereby the water either infiltrates through underlying strata or is discharged via a drainage ditch into the minor unnamed watercourse that bounds the site to the east, which flows directly into the sea, some 120m to the south-east of the site. These flows do not contribute to the Lealt River catchment.

Sub-Catchment B comprises the access track, car parking areas and associated former quarry periphery to the south and west of the site. Incident rainfall currently infiltrates through underlying strata or sheds via natural overland flow to the south and east of the site into the Lealt River catchment, or directly to the sea.

3.2 Proposed Site Drainage

The Lealt River to the south, and an unnamed minor watercourse to the east, of the Borrow Pit, will not be affected in any way by the proposed Borrow Pit; either from physical disturbance from channel removal or re-routing, or by direct disturbance to the watercourse bed.

There will only be minor alterations to the surface water flows as a consequence of Borrow Pit operations; during operations any incident rainfall will be managed within the site.

Sub-Catchment A shall increase slightly in size, due to the Borrow Pit excavation area being extended laterally to the west and north-west. Incident rainfall shall continue to collect within the proposed excavation void, and either disperse via infiltration, or be directed to a collection sump and be utilised for dust suppression and processing, as required, or discharged under controlled conditions into the minor watercourse to the east of the site, as occurs at present.

Sub-Catchment B comprises the existing access and yard area which will be used for armour stone stocks and loading. Soil mounds are proposed on the western and north-western boundaries of the excavation area (Drawing 73.02.03 refers). Overland flow from the north



and west will be diverted around the headwalls of the excavation. This is in order to avoid flow of surface water over borrow pit faces and into the excavation void and will help to maintain geotechnical stability of the strata. This is an accepted and common mitigation measure within the UK quarry industry.

Following cessation of extraction, surface water within the Borrow Pit will largely be held on site, aiding flood water attenuation. A shallow waterbody will likely form in the north-western area of the final void (Drawing 73.02.06 refers).

3.3 Soil Handling

No surface water from the surrounding catchments will enter the site due to the topography of the site and the surrounding area and formation of peripheral soil mounds.

Soil mounds will be seeded at the earliest opportunity to ensure maximum stability and early establishment of vegetation cover.

As soil stripping and soil storage areas are established, shallow bunds or temporary blind catch ditches shall be constructed, in order to ensure that runoff from soil operations will be contained and prevented from entering the existing drainage network and from there into nearby watercourses. Any runoff entering the blind ditches will be allowed to disperse by infiltration.

Monitoring of surface water run-off within the ditches downstream of the quarrying activities will be undertaken during this process.

3.4 Works Around Watercourses

There are no proposed works around or within watercourses. If any watercourses are to be affected by any potential future works, the appropriate CAR authorisations shall be sought, and all CAR General Binding Rules adhered to.

3.5 Discharges of Water

All groundwater and surface water collected within the Borrow Pit area will be diverted to a sump, to allow infiltration into underlying strata via joints and fissures. The sump may use collected water for dust suppression on haul roads during drier periods during spring and summer, as necessary. If required, surface water within the sump will be allowed to discharge into the unnamed burn to the east of the site, as it does at present. The Applicant understands the requirement to obtain any necessary permits or licences from SEPA for any associated activity.

There will be no discharge of water into the Lealt River during quarrying operations.



3.6 Collection and Settlement Sumps

Collection and settlement sumps are proposed to be constructed within the excavation void in order to contain and control incident rainfall generated within the site. The sumps shall be designed as operational requirements dictate, and shall have sufficient capacity to allow settlement of suspended solids and particulate matter.

3.7 Abstraction of Water

There are no proposed abstractions of water within the site operations. If any abstractions are to be required during any potential future works, the appropriate CAR authorisations shall be sought, and all CAR General Binding Rules adhered to.

3.8 Roadside Drainage

Drainage from alongside the A855 road shall continue as at present, with roadside drainage channels being culverted under the proposed access point, as necessary.

Any surface water generated within the site access roads shall be directed to shallow drainage channels adjacent to the access roads and thereafter into the site's water management system. No surface water shall be allowed to flow freely from the site.

3.9 Groundwater Management

Groundwater management will follow the policies and guidelines set out by the Water Framework Directive (2000/60/EC), the Groundwater Directive (80/68/EEC) and the Groundwater Daughter Directive (2006/118/EC) and their translations into Scottish law under the Water Environment and Water Services (Scotland) Act 2003 and the Water Environment (Controlled Activities) Regulations 2011. All aspects of groundwater management will be in accordance with current best practice techniques.

There are no identified vulnerable aquifers. There are no wells or groundwater extractions points within the area of the excavation or the area surrounding within the examined radius or 1km around the borrow pit.

Hazards associated with potential pollution of groundwater at the site relate to matters of contamination by oils, fuels or chemicals used in the operational process. Measures to control and/or mitigate these hazards are as set out in Section 9.5, Water Contamination.

4 Mitigation Measures

4.1 Particulates and Suspended Solids

Surface Water from the surrounding catchment will be prevented from entering the site, owing to local topography, and by appropriate use of peripheral bunding and soil mounds. It



is not, therefore necessary to consider particulate matter and suspended solids from the surrounding catchment area.

Incident rainfall to the excavation will not be diverted for treatment but will collect within the base of the borrow pit where initially it will infiltrate into the underlying bedrock, through naturally occurring joints and fissures enhanced by the effects of blasting. For operational purposes surface water within the excavation void shall be led to a sump or sumps, as operations dictate. Water from the sumps shall be utilised during drier months for dust suppression on haul roads, as necessary.

As the development deepens, review of the water treatment facilities shall be undertaken.

4.2 Contamination from Fuel/Oils used by Plant

Fuel shall be stored on site within a dedicated refuelling area, all tanks shall be double skinned with the appropriate bunding, as per the procedures outlined below.

All Oil and fuel storage and handling on site will be undertaken following published guidance, in particular SEPA's Guidance for Pollution Prevention (GPP) 2 – Above Ground Oil Storage Tanks (NIEA, SEPA & EA, 2017), and in compliance with the Control of Pollution (Oil Storage) (Scotland) Regulations 2006 and the Code of Practice for the Owners and Operators of Quarries and Other Mineral Extraction Sites (March 2003). The details are as follows:

- Risk assessments will be undertaken and List I and List II substances identified (List I, oils, fuels and hydraulic fluids only; List II, no substances identified. No explosives are stored on site);
- All deliveries of oils and fuels shall be supervised;
- All storage tanks shall be located within impermeable bunded containment of minimum capacity 110% of the tank or 125% if more than one tank is situated within the containment area (as recommended in SEPA Guidelines, GPP2, Above Ground Oil Storage Tanks, and in accordance with the Oil Storage Regulations, 2006);
- Any valve, filter, sight gauge, vent pipe or other ancillary equipment shall be situated within the containment area;
- Waste oil shall not be stored on site and shall be removed to dedicated storage or disposal facilities;
- Management procedures and physical measures shall be put in place to deal with spillages;
- Maintenance procedures and checks shall ensure minimisation of leakage of fuels or oils from plant;
- Refuelling and servicing shall be undertaken in a designated area or with adequate precautions in place;



- Where vehicle maintenance is necessary in the field due to breakdown, adequate precautions shall be taken to contain contaminants e.g. spill trays;
- Oils, lubricants and greases shall be stored within a container shed with a built-in drainage sump in the floor;
- Sumps and bunded areas shall be emptied periodically, the waste being removed from site by a registered waste carrier and taken to an appropriate licensed facility;
- Educational signage regarding correct refuelling procedure to prevent overfilling shall be installed;
- Refuelling nozzles which have safety features which prevent overfilling shall be used; and
- Visual inspections of the refuelling nozzles and hoses to ensure that they are in good working order to prevent leaks shall be undertaken.

Refuelling and servicing of plant will not be undertaken within the excavation void area, to prevent any discharge to groundwater of fuels and oils. Therefore risk to the water environment within the excavation void area is limited to accidental spillages from breakdowns or leaks.

4.3 Site Spillage and Emergency Procedures

Site Spillage and Emergency Procedures, in accordance with current published guidance, will be prominently displayed at the site and staff will be trained in their application.

If a spill cannot be safely contained or if the spill is causing a threat to life, evacuate the area and call 999 from a safe location.

If it is safe to do so, in accordance with GPP 22 Dealing with Spills, the following spill response procedures and mitigation measures shall include:

STOP

- Stop work immediately;
- Identifying and stopping the source of the spillage; and
- Eliminate ignition sources and provide natural ventilation;

CONTAIN

- Preventing the spillage spreading or entering watercourses by means of suitable material and equipment.
- Absorbent material, including oil absorbent material, will be available on site to mop up spillages. This will be in the form of oil booms and pads, and for smaller spillages quantities of proprietary absorbent materials.

NOTIFY

- The emergency contact telephone number of a specialist oil pollution control company shall be displayed on site; and



- All workers including any sub-contractors shall be made aware of guidelines for the spillage procedures at the site.

CLEAN-UP

- Attempt to soak up the spill using Absorbent material; Where it is considered that an oil/fuel spillage may have soaked into the ground, the contaminated ground shall be excavated and removed from site by a licensed waste carrier to a suitable landfill facility (however given the nature of the material is it unlikely that large quantities of spillages would infiltrate at fast rate); and
- Always follow your Duty of Care for waste when disposing of contaminated materials including spill/kit/equipment.

SEPA shall be informed of any discharge or spillage that may be harmful or polluting to the water environment. Written details of the incident shall be forwarded to SEPA no later than 14 days after the incident.

A monitoring scheme for inspection of these mitigation measures will be implemented. A regular review of all inspections, rules and schemes will be undertaken as part of management procedures.

5 Maintenance

The site water management system shall be maintained as follows:

- An inspection of all surface water ditches and any required sumps for surface water collection and settlement shall be undertaken on a regular basis and recorded to identify any maintenance requirements; and
- If damage or malfunction of the water management system is suspected, further investigation, and if necessary remedial action, shall be undertaken and SEPA shall be notified of any malfunction that may be harmful or polluting.

This Water Management Plan should be reviewed as the borrow pit expands and deepens to ensure adequate procedures are in place.



Appendix 9B – Pollution Prevention Plan

| Construction Environmental Management Document | |
|--|---------------------------|
| Section Number | 9B |
| Section Title | Pollution Prevention Plan |
| Issue | 2 |
| Issue Date | 12/12/2023 |
| Author | Daisy Hodge |
| Approved | Fiona Henderson |

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1 Introduction

Pollution prevention measures have been developed to minimise the risk of an environmental incident occurring during the construction of the Staffin Community Harbour. These measures combine both the current UK best practice and guidance from the documents listed in Section 2. However, in the unlikely event of an environmental incident occurring, it is important to have a comprehensive emergency response plan in place to minimise the potential impacts.

2 Outline of Procedures

The emergency response plan follows the 'Source – Pathway – Receptor' model as described in GPP1 (NIEA, SEPA, & Environment Agency, 2020). In the event of an environmental incident the following will be prioritised:

- Stop the source of the pollution.
- Interrupt any pathways to the environment.
- Report the incident in as much detail as possible to site management and the ECoW.
- Clean the contaminated area and recover pollutants.
- Analyse the event to prevent further incidents.

The site manager and ECoW will ensure all site personnel are trained in the Emergency Response Plan through regular toolbox talks, drills, and safety briefs.

3 Site Spillage and Emergency Procedures

Site Spillage and Emergency Procedures, in accordance with current published guidance, will be prominently displayed at the site and staff will be trained in their application.

If a spill cannot be safely contained or if the spill is causing a threat to life, evacuate the area and call 999 from a safe location.

If it is safe to do so, in accordance with GPP 22 Dealing with Spills, the following spill response procedures and mitigation measures shall include:

3.1 Stop

- Stop work immediately;
- Identifying and stopping the source of the spillage; and
- Eliminate ignition sources and provide natural ventilation;

3.2 Contain

- Preventing the spillage spreading or entering watercourses by means of suitable material and equipment.



- Absorbent material, including oil absorbent material, will be available on site to mop up spillages. This will be in the form of oil booms and pads, and for smaller spillages quantities of proprietary absorbent materials.

3.3 Notify

- The emergency contact telephone number of a specialist oil pollution control company shall be displayed on site; and
- All workers including any sub-contractors shall be made aware of guidelines for the spillage procedures at the site.

3.4 Clean-Up

- Attempt to soak up the spill using Absorbent material; where it is considered that an oil/fuel spillage may have soaked into the ground, the contaminated ground shall be excavated and removed from site by a licensed waste carrier to a suitable landfill facility (however given the nature of the material is it unlikely that large quantities of spillages would infiltrate at fast rate); and
- Always follow your Duty of Care for waste when disposing of contaminated materials including spill/kit/equipment (see Section 7: Site Waste, Materials and Plant Management Plan).

SEPA shall be informed of any discharge or spillage that may be harmful or polluting to the water environment. Written details of the incident shall be forwarded to SEPA no later than 14 days after the incident.

A monitoring scheme for inspection of these mitigation measures will be implemented. A regular review of all inspections, rules and schemes will be undertaken as part of management procedures.

4 Reporting

The appropriate reporting needs to be carried out for water pollution incidents. In the event of a pollution incident, SEPA must be notified via its pollution hotline within 24 hours of identification of an event which has:

- Caused or could cause adverse impact to the environment or harm to human health; and
- Could result in an emission to the environment that is not authorised.

The initial incident reporting to SEPA should be carried out by the most appropriate person onsite at the time: ECoW or the Site Manager.



All environmental incidents should be investigated, and an appropriate incident report produced. The ECoW is responsible for ensuring the events report is produced and appropriately distributed.

5 References

NIEA, SEPA, & Environment Agency. (2020). Guidance for Pollution Prevention: GPP1 - Understanding your Environmental Responsibilities - Good Environmental Practices. In (pp. 1-10): NIEA, SEPA and Environment Agency.



Appendix 9C – Oil Spill Contingency Plan

Controlled Document

| Construction Environmental Management Document | |
|--|----------------------------|
| Section Number | 9C |
| Section Title | Oil Spill Contingency Plan |
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| Author | Daisy Hodge |
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Contact Details:

Harbour Manager, Staffin Community Harbour, Staffin, Isle of Skye

Distribution List (Provisional):

Harbour Manager

Staffin Community Trust

SEPA

MCA

HM Coastguard

Organic Sea Harvest Ltd



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1 Introduction

This provisional Oil Spill Contingency Plan (OSCP) has been produced prior to construction works commencing to meet marine licence condition 3.2.6. It is recognised that the OSCP is required for operational activities not construction. Hence, prior to operations this provisional OSCP shall be reviewed and updated to reflect the as built arrangements. It is currently thought unlikely that Staffin Community Harbour (SCH) will fall under the Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Convention) Regulations 1998, however this plan has been developed taking account of the aforementioned regulatory requirement. As such, UK Government guidance entitled 'Contingency Planning for Marine Pollution Preparedness and Response' has been proportionally taken into account.

1.1 Statutory Requirement

All above ground fuel oil storage will be compliant with General Binding Rule (GBR) 28 of the Water Environment (Controlled Activities) Regulations, 2011 (CAR) as amended.

This OSCP has been developed in line with requirements of the Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Convention) Regulations 1998. The plan clearly defines the statutory responsibilities placed on the Harbour Authority for responding to oil pollution within the harbour area. This is applicable to harbours with a far larger likelihood of having a large-scale oil spill, however, the SCH has implemented this OSCP to ensure that, should a spill event occur, the necessary steps will be followed to minimise environmental damage.

1.2 Purpose of the Plan

The purpose of this Plan is to ensure that there is a timely, measured and effective response to incidents of, and impact from, marine pollution resulting from the operation of the SCH, located within Òb nan Ron, Garafad, Staffin, in the north-east of Skye (Grid Reference: NG494 681 – See Drawing 73.04.01). To achieve this, it identifies the key stakeholders involved, the arrangements under which they should operate, and the broad responsibilities attached to each. Further, it seeks to provide guidance on general incident management, the method and structures of co-ordination and communication, and general resources that may be useful to aid a spill event.

This plan guides the Harbour Manager and other relevant personnel through the decisions which will be required in an incident response. The information in this OSCP aims to provide a source of information, thus reducing the chance of oversight or error during the early stages of dealing with an emergency situation.

For the plan to be effective, it must be:



- familiar to those with key response functions in the Harbour;
- regularly exercised (if deemed appropriate); and,
- reviewed and updated as required.

Reviews should be completed at least every five years, and in the event of learnings gathered during incidents or exercises. This review will be carried out by the Harbour manager in consultation with appropriate consultees.

1.3 Scope of the Plan

This plan details the contingency arrangements for responding to actual or threatened oil pollution incidents associated with the used of SCH slipways and pontoons.

The response strategy for the SCH Oil Spill Contingency Plan has been developed to include assessment of the spill risks and possible sources of spillage associated with the operations within the Harbour area.

This plan uses a tiered response to oil pollution incidents, shown below in Table 1.3.1. The plan is designed to deal with Tier One and Tier Two incidents. Due to the scale of the SCH, small size of vessels able to utilise SCH utilities, and the volume of marine diesel stored on site, SCH does not pose a risk for Tier 3 incident.

Where a spillage is associated with a wider emergency, then additional factors involving the safety of personnel will take precedence over the pollution response. The salvage and casualty management of any vessel, which poses a threat of pollution are priority considerations.

Table 1.3.1: The Tier classification System

| Tier | Description |
|--------|--|
| Tier 1 | Small operational type spills that may occur within a location as a result of daily activities. The level at which a response operation could be carried out successfully using individual resources and without assistance from others. |
| Tier 2 | A medium sized spill within the vicinity of a company's location where immediate resources are insufficient to cope with the incident and further resources may be called in on a mutual aid basis. A Tier 2 incident may involve Local Government. |
| Tier 3 | A large spill where substantial further resources are required and support from a national (Tier 3) or international co-operative stockpile may be necessary. A Tier 3 incident is beyond the capability of both local and regional resources. This is an incident that requires national assistance through the implementation of the National Contingency Plan and will be subject to Government controls. |

1.4 Interfacing Oil Spill Contingency Plans

1.4.1 National Contingency Plan

In the event of an oil spill incident, which calls for a regional level response under Tier 2 or a Tier 3, the Maritime and Coastguard Agency (MCA) may decide to implement the National



Contingency Plan (NCP). In this event, the MCA will take control of at-sea counter pollution measures. Any formal hand-over of responsibility to MCA for dealing with an oil pollution incident should be formally documented. If required, the Harbour's oil spill response resources and facilities will be made available to MCA. The NCP can be accessed at:

<https://www.gov.uk/government/publications/national-contingency-planncp>

1.5 Consultation

As a statutory consultee, HM Coastguard was formally consulted during the preparation of this plan.

1.6 Places of Refuge

The UK has an obligation under the Safety of Life at Sea Convention (SOLAS) to provide shelter for maritime casualties which may require use of waters within a port as a place of refuge (PoR). The MCA and Secretary of State's Representative for Maritime Salvage (SOSREP) are responsible for discharging the SOLAS obligation and have requested that harbour authorities make assessments and plans for this eventuality and incorporate them as an adjunct to their OPRC Plans. To assist with an assessment the information listed below follows the headings prompted by the Guidelines for Ports.

- STC Harbour has a charted depth of -3m Chart Datum (CD) at the deepest berths, and -1.2 CD in the entrance channel;
- Mooring facilities are designed for 15 vessels up to 20m length over all (LOA), and facilities for a further 15 smaller vessels; and
- The seabed geology within the proposed development and immediate vicinity comprises rock and hard substrate.



2 Risk Assessment

This OSCP has been created pre-construction of the upgrade to the SCH hence, operational details are yet to be confirmed and implemented. As a result, this OSCP will be updated when operational arrangements are finalised, and as required on an ongoing basis.

Potential risks are identified within this section. Engineered mitigation has been designed into the development to minimise risks as far as practicable, these are described within this section. Where appropriate managerial controls/mitigation have also been identified to minimise risks to the environment. The aim being to prevent a spill and hence, minimise the need to implement the Spill Response Actions detailed in Section 3.

2.1 Navigational Incidents

SCH is restricted to all but shallow draft pleasure and fishing vessels, as such there is no high fuel capacity vessels, and no crude or heavy oil fuel tanker marine traffic expected at SCH. The risks of a pollution event resulting in the loss of fuel have been assessed to reflect the risks that are possible to arise at SCH.

The risk of a pollution incident at SCH is linked to:

- The frequency of vessel movement;
- Performance of vessel crew;
- Traffic density;
- Hydrographic and meteorological conditions; and,
- Type and quantity of pollutants on-board.

This section of the document will be reviewed once the operational navigation risk assessment is in place to ensure all appropriate risks are included and that the mitigation measures identified here, remain effective.

2.1.1 Navigational Risks

The proposed SCH upgrades will include pontoons able to accommodate up to 30 vessels to a maximum of 20m LOA, including leisure vessels and commercial vessels used by the crew of the nearby fish farm and marine tourism operators. The enhancements of the SCH may result in increased traffic within the harbour, hence introducing the possibility of a marine incident, such as the:

- Collision of two or more vessels, resulting in the rupture of one or more fuel tanks;
- Capsizing;
- Contact of a vessel with port infrastructure, resulting in the rupture of a side fuel tank;
- Grounding of a vessel;
- Fire/explosion on-board a vessel;



- Structural failure due to hull cracks; and
- Abandonment.

It should be noted that the number of vessel movements will remain low, albeit higher than current levels. It is not expected that multiple vessel movements will be undertaken within the harbour at one time. On very rare occasions where a specific activity is ongoing, for example a recreational event or a particular activity associated with the fish farms, there could be simultaneous vessel movements.

It is recognised that the water depths around the harbour area are shallow, with access from the east tidally restricted. As such vessels are encouraged to access SCH from the north, down the western side of Òb nan Ron.

The chances of fire, issues with hull failure or other vessel faults will relate partly to the age and condition of vessels. Similarly, abandonment is more likely to occur with an old, ill-maintained vessel.

It is noted that the volumes of any oil release associated with an incident are limited by the volume of fuel tank carried by the vessel. Fuel carrying capacity of vessels using the SCH are expected to range between 40-500l, with occasional larger visiting vessels not expected to exceed a carrying capacity of 1000l.

2.1.2 Navigational Mitigation

To minimise the likelihood of both capsizing and of collision between vessels when there are multiple vessels moving at the same time in the harbour area, good communication is key. All vessels will be expected to adhere to the standard navigational protocols. Furthermore, if a specific activity is ongoing where multiple vessels are likely to be active in the harbour, the Harbour Manager will have a suitable oversight and control of movements as required.

Appropriate demarcations of harbour infrastructure, and their inclusion of navigational charts will help harbour users to avoid collisions with infrastructure. Appropriate siting of fenders will protect vessels from collisions with infrastructure as they moor alongside.

To reduce the likelihood of vessels running aground, six navigation aids in the form of cone and can buoys will be installed to mark a channel in the deeper area of water between Staffin Bay and Òb nan Ron. This solution was discussed with the National Lighthouse Board (NLB), and it is understood that a Statutory Sanction forms for the aids to navigation will need to be submitted to the NLB prior to installation. Navigation charts will be updated to reflect the location of the buoys, as well as the areas of high seabed, to aid safe passage of vessels to the SCH. Access from the east into the harbour will be actively discouraged by the Harbour Manager.



To minimise the risk of fires and fuel entering the marine environment as a result of degraded vessel condition, there will be a requirement set out with regard to use of SCH, to ensure that vessels are appropriately maintained with valid insurance in place. Compliance with which will be managed by the Harbour Manager.

Similarly, SCH users will be made aware of 'Abandonment' processes which will be enforced, that if vessels appear to be abandoned, the owner will be contacted. If the owner is not contactable, does not respond, or remove their vessel, then it will be removed from the water and appropriately disposed of.

2.2 Loss of Fuel/Refuelling Incidents

Once operational, the upgrade to SCH is anticipated to be able to support activities for boat owners and operators, which includes the refuelling of vessels. To provide refuelling services, the SCH development will install and maintain two double-skinned/bunded 15,000l fuel storage tanks. The storage tanks will need to be filled on a regular basis, which will be done by pumping the fuel from a road oil tanker into the tanks using the tanker hoses and pumps. A refuelling point on the pontoons will be connected to the onshore storage tanks via a coaxial or bunded pipeline, to allow vessel refuelling.

2.2.1 Loss of Fuel Risks

The risk of fuel loss at SCH may arise from:

- Oil storage or refuelling infrastructure failure or damage;
- An incident resulting from the filling of onshore fuel storage tanks from a road fuel tanker.
- Incident during vessel refuelling activity.

2.2.2 Loss of Fuel Mitigation

A combination of engineered and management mitigation solutions have been identified and will be implemented to mitigate the risk of fuel loss into the marine environment.

2.2.2.1 Engineered Mitigation

To minimise the risk resulting from storage or refuelling infrastructure failure, fuel storage tanks will be onshore as far as practicably possible from all watercourses and the marine environment. The requirements of GBR28 for the storage of oil under CAR will be implemented which will mitigate any potential risks associated with the fuel storage. This will include, the tanks being installed on impermeable concrete apron and being double skinned to contain up to 110% of the total volume of the storage tank.

The area in the immediate vicinity of the tanks is a concrete apron that will drain via a 7600m³ oil interceptor. The interceptor has been sized to capture the maximum volume which is stored



in each section of a road oil tanker that will be utilised to fill the tanks at SCH. The outlet from the interceptor will connect to the outfall pipeline, associated with foul drainage, after the septic tank. The clean water from the interceptor will be discharged through the outfall pipeline below MLWS. Any oil or solids accumulating in the interceptor will be removed by an appropriately licenced waste contractor for treatment and disposal offsite.

The oil storage tanks will be connected by permanent, bunded, fixed pipework to a refuelling point at the pontoons to allow vessels to be refuelled while berthed within the SCH development. The pump nozzle will be fitted with a fuel shut-off valve to reduce the likelihood of spills due to overfilling, and an emergency stop valve will be in place to halt fuel supply should an emergency or spill arise.

It is noted that refuelling points on modern vessels are generally located in areas of the vessel where any lost fuel can be contained to prevent escape of fuel into the environment during refuelling.

2.2.2.2 Management Mitigations

Oil will be supplied to the harbour by an established fuel supplier, as such their staff will be appropriately trained in the use of their equipment, and implementation of spill management procedures. The tanks will be locked and hence the Harbour Manager will be present when tank filling is being undertaken, they will ensure the road oil tanker performing filling activities remains on the concrete apron until completion of filling. As detailed in Section 3 the Harbour Manager will enact the Spill Response Procedures if an incident were to occur.

Use of the pump for the pontoon refuelling service will be restricted to the Harbour Master or trained keyholders. Key control of the refuelling operations will ensure that only those appropriately trained in the proper use of the refuelling pump will be permitted to use it. Keyholders will also be trained in spill kit usage, so that the appropriate course of action will be undertaken, should a spill event occur during refuelling at the pontoons. A spill kit of a suitable size will be located at the dispensing point (See Section 3)1.

The harbour manager will be on call 24/7, with manning hours expected to be 9 to 5 (TBC). This information will be confirmed prior to operations of the proposed new infrastructure.



3 Spill Response Actions

This section outlines the steps required to be taken during a pollution incident event, its purpose is to guide SCH personnel and users through the procedure of managing an oil spill within the jurisdiction of SCH to mitigate the impacts of an oil pollution incident.

During oil spill response activities account must be taken of the following:

- site hazard information;
- boat safety;
- COSHH Regulations and material safety data sheets;
- personal protective equipment needs;
- heat stress, cold stress and hypothermia; and
- decontamination.



3.1 Spill Response Procedure

The spill response procedure is shown below in Figure 3.1.1.

Figure 3.1.1: Flow diagram of the Spill Response Procedure

If the spill cannot be safely contained or if the spill is causing a threat to life, evacuate the area and call **999** from a safe location

IF SAFE TO DO SO

STOP > CONTAIN > NOTIFY > CLEAN-UP

STOP

- Stop work immediately
- Stop the leak or eliminate the source of the spill
- Eliminate ignition sources and provide natural ventilation

CONTAIN

- Use pollution control equipment (e.g. spill kits, drip trays, floating booms/absorbent material for marine spills) to contain the spill
- Check the spill has not reached any drains, watercourses or other sensitive areas
- Cover all drains/manholes to prevent the spill from entering the drainage system

NOTIFY

- Once the spill has been contained notify your emergency contact. Details at the bottom of the page.

CLEAN-UP

- Attempt to soak up the spill using absorbent material
- Always follow your Duty of Care for waste when disposing of contaminated materials including spill kit/equipment.



3.2 Action Cards

The following section contains action cards for the observer of the incident and for the SCH Manager, for use during an oil spill incident. The action cards follow a methodical checklist style, in order that they effectively guide the person fulfilling the role through the actions that they are expected to take and also the responsibilities falling upon them during an oil spill response incident.

The job cards are split into four sections:

- Alert - This section lists the different notifications that will be required, both internally and externally.
- Initial Actions - Those that will be required to be carried out immediately to initiate the response operation.
- Further Actions - Those that will be required to be carried out when the response operation is underway.
- Final Actions - Those that will be required to be completed before the response operation can be officially stood down.

Table 3.2.1: Action card for the observer of the incident

| Observer of Incident | | |
|------------------------|--|--|
| Responsibilities | <ul style="list-style-type: none"> • Raise the alarm to notify SCH Harbour Manager. | |
| Step | Actions | Additional Information |
| Alert | Notify SCH personnel | Number to be added once Harbour Master is appointed. |
| Initial Actions | <ul style="list-style-type: none"> • If SAFE to do so, attempt to either stop or reduce leakage. • Provide as much information as possible such as: <ul style="list-style-type: none"> • Location of the spill • Oil type • Estimated quantity • Source of spill – Line identity | DO NOT: <ul style="list-style-type: none"> • allow naked flames • allow operation of non-intrinsically safe equipment • allow oil to directly contact the skin • approach spill site downwind |
| Further Actions | <ul style="list-style-type: none"> • Standby to guide response personnel to scene and assist if possible • Act on instructions of the Harbour Manager or deputy. | |
| Final Actions | <ul style="list-style-type: none"> • When unable to lend further assistance, submit log to the Harbour Manager | Include: <ul style="list-style-type: none"> • Time of events • What you saw • What you did • Who arrived and when <ul style="list-style-type: none"> ○ What they did |



Table 3.2.2: Action card for the Harbour Manager

| Harbour Manager | | |
|-------------------------|---|--|
| Responsibilities | <ul style="list-style-type: none"> • Receive information/report of oil spill • Initiate response measures • Notify all relevant external organisations • Maintain communication with all vessels in the vicinity • Delegate tasks as required to responsible persons | |
| Step | Actions | Additional Information |
| Alert | <ul style="list-style-type: none"> • HM Coastguard | |
| Initial Actions | <ul style="list-style-type: none"> • Proceed to incident location • Investigate cause / source of spill • Communicate all information to HM Coastguard • Take samples of spilled oil (if applicable) • Initiate personal log • Take photographic evidence • Collect evidence and take statements | <ul style="list-style-type: none"> • Confirm if it's stopped or ongoing |
| Further Actions | <ul style="list-style-type: none"> • Track the leading edge of slick • Provide on scene co-ordination of the incident response • Review strategy • Survey the shoreline | |
| Final Actions | <ul style="list-style-type: none"> • Lead debrief and update response strategy with lessons learned. | |



4 The Data Section

4.1 Contact Directory

In the event of an oil spill event, the following organisations in Table 4.1.1 should be informed, according to the relevant Tier classification of the spill.

Table 4.1.1: Contact directory for different categories of spill

| Organisation | Contact Details |
|--|--------------------------|
| Tier One Spill | |
| HM Coastguard | 999 – Ask for Coastguard |
| Scottish Environmental Protection Agency (SEPA) Helpline | 01786 457 700 |
| Tier Two Spill | |
| HM Coastguard | 999 – Ask for Coastguard |
| Scottish Environmental Protection Agency (SEPA) Helpline | 01786 457 700 |

4.2 Training

The importance of training for harbour personnel who may become involved in the response to oil spill incidents is recognised and acknowledged. It is advisable that the Harbour Master and all relevant individuals associated with SCH undergo periodic training in line with the following matrix in Table 4.2.1. Following any exercises or incidents, an evaluation will be carried out and updates made as necessary. See section 1.2.

Table 4.2.1: Suggested training timetable

| Exercise | Harbour Manager | Operator/ Refuelling Key Holders | Frequency | Notes |
|------------------------------|-----------------|----------------------------------|-----------|--|
| Notification Exercise | ✓ | | Annually | Test communication systems, check availability of personnel, evaluate travel options and the speed at which travel arrangements can be made. |
| Mobilisation Exercise | ✓ | ✓ | Annually | Test the capability of a local team to respond to a Tier 1 or 2 type spill. |
| Tabletop Exercise | ✓ | ✓ | Annually | Test the capability of a local team to respond to a Tier 1 or 2 type spill. |
| Incident Management Exercise | ✓ | ✓ | 3 yearly | Demonstrate spill response management capabilities, integration of roles of different parties, focus on overall incident management aspects. |



4.3 Environmental Sensitivities

A review of protected areas nearby the proposed SCH development was completed (shown in Table 4.3.1) which identified the following designated sites that could be impacted by an oil spill at the SCH development during operation. Note that the farther away the site, the larger a spill incident would need to be to cause significant damage.

Table 4.3.1: Designated sites and distance from the proposed SCH development

| Designated site | Distance from SCH |
|---|-------------------|
| Dinosaur Footprints Geological Conservation Review (GCR) | 0km |
| Inner Hebrides and the Minches Special Area of Conservation (SAC) | 0km |
| Ascrib, Isay and Dunvegan SAC | 28km West |
| Sea of the Hebrides Marine Protected Area (MPA) | 46km Southwest |
| Northeast Lewis MPA | 52km North |
| Monach Islands SAC | 102km West |

4.4 Waste Management

Oily wastes will be bagged and placed in a designated waste bin, awaiting collection by a registered waste carrier. This section will be updated once the upgrades to the SCH development have been constructed, and the harbour is operational.

4.5 Counter Pollution Resources

Appropriately sized oil spill kits will be located at the oil storage tanks and at the refuelling point at the pontoons. Floating booms capable of containing spills of an expected nature taking account of the harbour layout will be available within the SCH.

The absorption capacity available will be at least 500l of oil to ensure that full loss of containment of a fuel tank, from the larger regular users could be recovered.

Spill kits will be regularly checked and replaced to ensure ongoing response capability.

Spill action cards will be included in each spill kit to ensure steps identified in Section 3 are implemented.

Dispersants will only be used in extreme circumstances where absorbents are deemed ineffectual, and under direction of the Harbour Master in conjunction with SEPA.

This section will be updated once the upgrades to the SCH development immediately prior to operations to take account of actual arrangements.

Suitable Personal Protective Equipment (PPE) for the handling of oil will be made available including, for example, gloves, chemical resistant coveralls, eye protection and if deemed appropriate, face masks.



5 Glossary

| Acronym | Definition |
|---------|---|
| CAR | Water Environment (Controlled Activities) Regulations, 2011 |
| CD | Chart Datum |
| GBR | General Binding Rule |
| GCR | Geological Conservation Review |
| l | Litre(s) |
| LOA | Length Overall |
| MCA | Maritime and Coastguard Agency |
| MPA | Marine Protected Area |
| MSMP | Marine Safety Management Plan |
| NCP | National Contingency Plan |
| NLB | National Lighthouse Board |
| OSCP | Oil Spill Contingency Plan |
| PoR | Place of Refuge |
| PPE | Personal Protective Equipment |
| SAC | Special Area of Conservation |
| SEPA | Scottish Environmental Protection Agency |
| SOSREP | Secretary of State's Representative for Maritime Salvage |
| SOLAS | Safety of Life at Sea Convention |
| SCH | Staffin Community Harbour |
| > | More than |

0 100 200 300 400 500 m

Rubhan Aiseig

Rubha Bàn

Ob-nan Long



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Title: 73.04.01 Project Development
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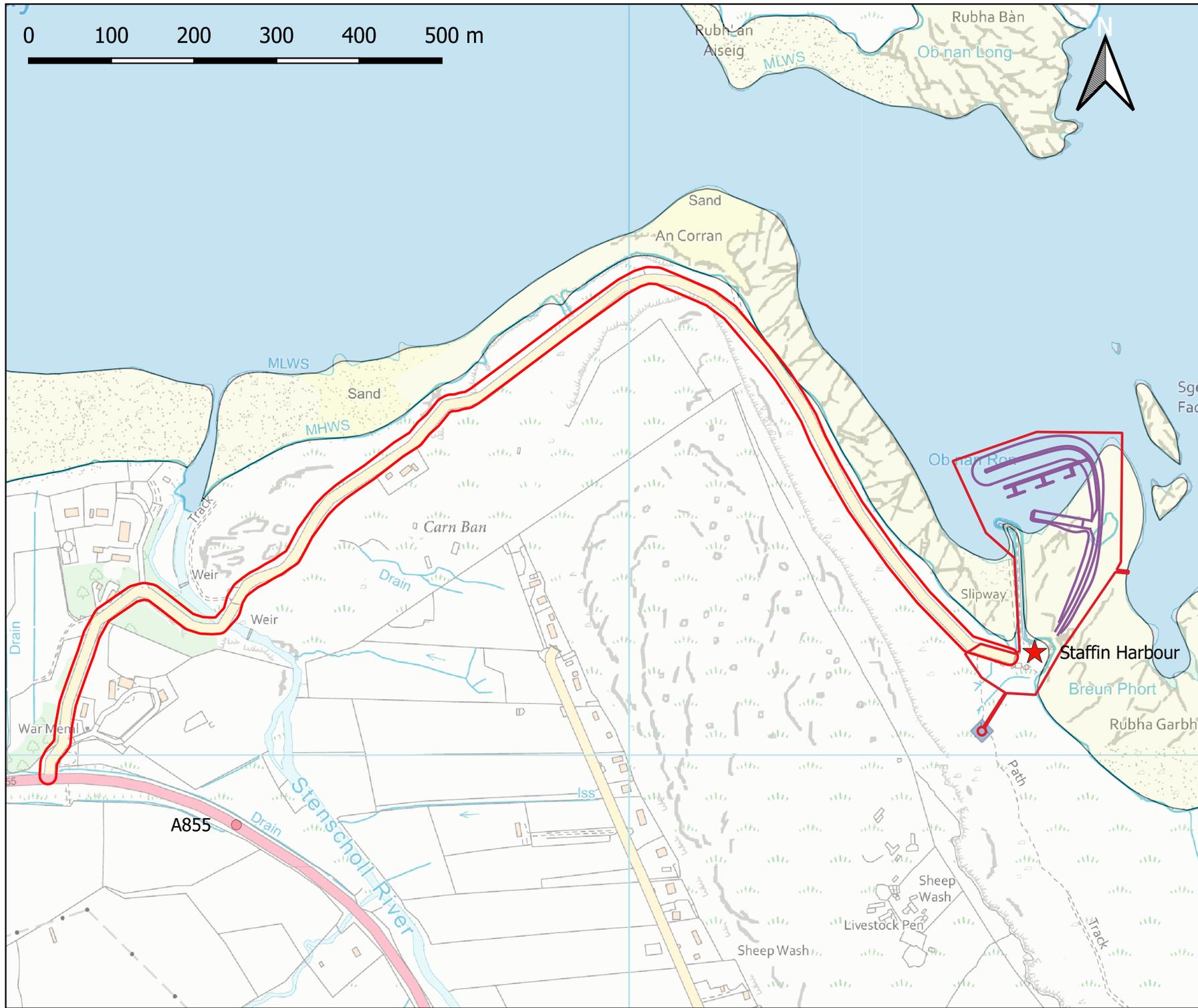
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08/09/2021

Legend

-  Staffin Harbour
-  Development Boundary
-  Proposed Harbour Development
-  Minor Road
-  A855 Road





| Construction Environmental Management Document | |
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10 Dust Management Plan

10.1 Introduction

The Dust Management Plan includes proposed measures from Chapter 5 of the Environmental Impact Assessment Report (EIAR) (Affric Limited, 2021) and was agreed with the Planning Authority. Therefore this document fulfils the requirement from Conditions 6 & 7 from Planning Consents No: 21/04525/FUL & No: 21/04521/FUL respectfully. All the mitigation measures shall be in place prior to the commencement of the developments or as otherwise will have to be agreed in writing by the planning authority.

10.2 Control Measures

With the emphasis on the use of best practice to maintain acceptable site dust levels, identification of dust sources and the most appropriate mitigation must be considered within overall site management practices. A Site Dust Management Plan has therefore been developed that adopts the principles of:

- Prevention, in other words, preventing dust from becoming airborne; and
- Containment and/or recapture of dust once it is in the air.

The following control measures will be used in order to minimise dust nuisance:

10.2.1 Soil Stripping and Mound Formation

- Restrict the duration of the activity; and
- Seed mounds at earliest opportunity.

10.2.2 Drilling Operations

- All drilling rigs are fitted with dust extraction equipment (dust collection during drilling is mandatory under COSHH Regulations); and
- Dust collected from rigs shall be removed from the area prior to blast detonation.

10.2.3 Loading of Excavated Material

- Minimise tipping height;
- Avoid lorry overloading; and
- Dampening of surface and around the excavation area during dry windy weather.

10.2.4 Site Vehicle Movements

- Water bowser spraying on haul roads;
- Exhausts directed upwards;
- Limit vehicle speeds;
- Maintenance/grading of roads; and



- Minimise gradient of roads where compatible.

10.2.5 Crushing and Screening

- Locate within quarry void;
- Emissions monitoring from crushing and screening plant shall be undertaken in accordance with the conditions in the Part B PPC permit for mobile processing plant; this requires regular visual assessment; and
- Where required dust suppression systems shall be used to minimise emissions from crushing.

10.2.6 Temporary Aggregate Storage

- Locate crushed aggregate storage within quarry void;
- Stockpiles of material shall be maintained at suitable heights and accessible for dampening during dry or windy conditions; and
- Cover or enclose fine materials.

10.2.7 Transportation of Aggregate Off-site

- All loaded vehicles carrying crushed aggregate shall be sheeted;
- Provision of maintained surfaced access; and
- Dampening of access roads during dry windy weather.

10.2.8 General Requirements

- During prolonged periods of dry weather plant and vehicles shall not travel over unwatered haulage roads;
- A portable water sprayer shall be used to minimise dust on haul roads;
- An adequate supply of water shall be available at all times for the motorised spraying unit;
- All haul roads shall be subject to regular grading;
- All vehicles used for the movement of materials within the site shall be equipped with exhausts pointing away from the ground;
- All relevant heavy plant shall be fitted with radiator fan deflector plates; and
- If, in extreme adverse conditions the aforementioned measures are not adequate, the following action shall be taken:
 - a) Restriction on the speed of vehicles on site;
 - b) Temporary cessation of activities giving rise to concern.

10.3 Dust Management

The following measures shall be adopted to ensure effective day to day dust management during operational periods:



- The site manager will be the responsible person for ensuring that the dust management plan is enforced. In his absence a suitable competent person will be nominated;
- Regular visual inspections of dust conditions will be undertaken by site staff. The frequency of inspections will be determined on a daily basis in accordance with prevailing conditions;
- Regular visual assessments of dust emissions will be made daily by site supervisory staff and remedial actions initiated as necessary. The results of such monitoring will be recorded in a daily log book;
- Site management will give attention to advance weather forecasts and organise dust management requirements accordingly; and
- In the event of a complaint concerning dust emission, the site manager shall immediately undertake an investigation and instigate any necessary remedial action.

10.4 Complaint Procedures

Should complaints be made to the quarry management relating to dust emission, then these shall be immediately investigated. All such complaints, and any action undertaken as a result of the investigation, shall be recorded in a log held at the quarry office which shall be available for inspection by the Planning Authority on request.



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11 Noise and Vibration

11.1 Introduction

A detailed assessment of in-air noise effects was completed, as detailed in Chapter 14 of the EIAR. Noise and vibration impacts are primarily associated with blasting activities at Lealt Borrow Pit. The majority of construction activities at the Staffin Community Harbour, are at a sufficient distance away from noise sensitive receptors and do not give rise to any detrimental effects.

General construction noise impacts should be minimised by implementing best practice techniques, whilst a blasting method statement is required for works at Lealt Borrow Pit (Appendix 11A).

11.2 Mitigation

11.2.1 Working Hours

Working hours were proposed within the EIAR with regard to noisy activities, however, the Highland Council have conditioned hours in which activities which could cause a noise nuisance can be carried out. Hence, this section reflects the planning consent conditions and not the EIAR.

Operations, including vehicle movements, associated with the Staffin Community Harbour development and Lealt Borrow Pit works, for which noise is audible at the curtilage of any noise sensitive property, shall only be permitted between

- 08:00 hours and 19:00 hours Monday to Friday; and
- 08:00 hours and 13:00 hours on Saturdays.

Outwith these hours there shall be no activities for which noise is audible at the curtilage of any noise sensitive property.

In addition, no blasting operations at the Lealt Borrow Pit shall take place out with the hours of 10.00am to 5.00pm Monday to Friday and not at all on Saturdays, Sundays, or a Bank Holiday in Scotland, as prescribed in Schedule 1 of the Banking and Financial Dealings Act 1971 (as amended).

11.2.2 Vibrations

Ground vibrations as a result of the blasting operations shall not exceed a peak particle velocity of 6mms^{-1} in 95% of all blasts within any 6-month period. No individual blast shall exceed a peak particle velocity of 12mms^{-1} as measured at noise sensitive properties. The measurement shall be the maximum of three mutually perpendicular directions taken at ground-level at any vibration sensitive building. A blasting method statement produced by the Blasting Contractor is included as Appendix 11A, entitled Lealt Shotfiring Rules, which outlines works at Lealt Borrow Pit. Additionally, Appendix 11B depicts the Blasting Danger Zone and Car Parks Closure Plan.



11.2.3 General Mitigation

To minimise noise levels generated, good working practices will be employed to keep noise levels down throughout the construction process, this includes:

- Ensuring regular maintenance of all equipment used on site, including maintenance related to noise emissions;
- Ensuring that vehicles and vessels are loaded carefully to ensure minimal drop heights so as to minimise noise during operation; and
- Ensuring that machines are shut down between working periods or throttled down to a minimum.



Appendix 11A – Blasting Method Statement

| Construction Environmental Management Document | |
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Lealt Quarry

Shotfiring Rules

Where these rules are prepared, or assistance provided by blasting contractor, the Operator has ultimate responsibility, as set out below.

Rationale:

Quarries Regulations 1999, Second Edition

Regulation 6(1) *It shall be the duty of the operator of every quarry to take the necessary measures to ensure, so far as reasonably practicable, that the quarry and its plant are designed, constructed, equipped, commissioned, operated and maintained in such a way that persons at work can perform the work assigned to them without endangering their own safety or the health and safety of others.*

Guidance 6

Paragraph 45 Although the majority of the duties under these Regulations are placed on the operator, contractors may also be liable if, by their act or default, they cause the operator to commit an offence (see section 36(1) of the HSW Act).

Regulation 7(1) *The operator shall ensure that no work is carried out unless a document (in these Regulations referred to as the "health and safety document" has been prepared which –*

- (e) records the following information –*
- (vi) the shotfiring rules required by regulation 25(2)*

Regulation 25(2) *It shall be the duty of the operator to ensure that –*

- (a) Suitable and sufficient rules are made which lay down in writing the procedures for –*
 - (i) shotfiring operations at the quarry,*
 - (ii) appointing shotfirers, trainee shotfirers and storekeepers,*
 - (iii) authorising other persons who will be involved with the storage, transport or use of explosives,*
 - (iv) dealing with misfires, and*
 - (v) ensuring, so far as reasonably practicable, that such rules are complied with;*

Guidance 25

Paragraph 185 The operator's key responsibility regarding the use of explosives, as in relation to other risks, is to ensure the work is properly managed, planned, co-ordinated and supervised. The duties placed on the operator under this regulation reflect this. This is the case whether shotfiring operations are undertaken by a quarry worker or by a specialist blasting contractor.

Paragraph 189 The operator may appoint a contractor, the blasting contractor, to carry out some or all of the explosives work. The operator is, nevertheless, always responsible for the overall management of the quarry and safe use and security of the explosives. The operator is similarly responsible for the shotfiring rules and blast specifications, even if a contractor or consultant actually draws them up.

Paragraph 190 Although the legal duties relating to explosives are placed on the operator, the blasting contractor may also be liable in some cases (see paragraph 45).

This page can be removed from the issued Shotfiring Rules.

Lealt Shotfiring Rules

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Lealt Shotfiring Rules

1. Introduction

These rules form the Operator's Shotfiring Rules for Lealt Quarry, Skye, as defined in the Quarries Regulations 1999 regulation 25(2)(a). These rules are authorised for use at Lealt by the Quarry Manager as the person appointed to manage shotfiring operations at the Quarry. Rules placed in writing by the Quarry Operator become legally binding under the Quarries Regulations 1999 and should be adhered to as the regulations themselves. This means that it is an offence not to comply with these rules or instructions given by designated appointed persons as described in these rules.

These rules will be directly issued to those individuals upon whom they impose duties, and those individuals must sign their copy once they have read, understood and are able to act following the rules. It is the responsibility of the Quarry Manager to ensure that those persons who have duties under these rules have received and accepted the latest copy. Copies of the current rules will be displayed at the following locations:

- Quarry Office

Once new rules are issued, copies of previous rules should be destroyed, except for a master copy held on file by the Quarry Manager for 3 years.

[\(Contents Page\)](#)

2. Appointments and Responsibilities

Drilling and blasting operations are carried out by CS Drilling for GF Job under a subcontract agreement. Full duties of each role are described in these rules and individual appointments.

GF Job and CS Drilling will not knowingly appoint or authorise **Prohibited Persons** in compliance with Explosives Regulations 2014, Regulation 32 and definition page 64 and have not ever convicted of any offence under the Explosive Substances Act 1883. NOTE: This statement is included in relevant letters of appointment.

The above appointments must be in writing on standard company forms: (See Appendix 1 - 10) a copy must be retained by the responsible manager and any new appointments letters provided to the responsible manager before blasting commences. Written appointment records will be kept during the term of the appointment and for 3 years after termination of the appointment for whatever reason.

2.1. Appointments

Explosives Supervisors will be appointed in writing by the Operator GF Job. For the key role of Explosives Supervisor, evidence of competency must be provided to the Operator prior to appointment.

All other appointments listed will be appointed in writing by the Explosives Supervisor:

- Shotfirer
- Trainee Shotfirer
- Explosives Storekeeper (if required)
- Laser Surveyor
- Driller
- Bulk Emulsion Truck Operator
- Handle explosives
- Transport explosives

In addition, the Quarry Manager will appoint sufficient Sentries in writing to adequately control the Danger Zone.

The Quarry Operator / Explosives Supervisor must ensure that the appointees have suitable training, qualifications, and experience to competently undertake that role and check that they are not a prohibited person. Records of these checks must be kept with the appointment – these may be in the form of training records, competency assessment forms, or copies of a CV and certificates.

Minimum Qualification Requirements at the quarry:

- **Explosives Supervisor** – (before appointment) L5 Certificate in Blast Design **and** L3 Diploma in Shotfiring, **or** NVQ equivalents, within 12 months of appointment, complete L5 Diploma in Shotfiring Supervision.

Lealt Shotfiring Rules

- **Shotfirer** – L3 Diploma in Shotfiring **or** NVQ equivalent.
- **Trainee Shotfirer** – in possession of a written training programme **and** under close personal supervision of the shotfirer.
- **Explosive Storekeeper** – L2 Award in Explosives Storage **or** NVQ equivalent.
- **Bulk Explosives Truck Operator** – L3 Certificate in Bulk Explosives Truck Operations **or** NVQ equivalent.
- **Face Profiler** – L2 Certificate in Face Profiling **or** NVQ equivalent.
- **Driller** – L2 Diploma in Drilling Operations **or** NVQ equivalent.

2.2. Main Role Responsibilities of Appointees

The duties and responsibilities of each role must be included in the written appointment. Individuals may be appointed to several roles but must follow the rules relating to the role they are undertaking irrespective of their employment job title.

2.2.1. Quarry Manager

Key Responsibilities:

- Overall responsibility to safely co-ordinate all activities on site.
- The area for drilling has been checked as required by any geotechnical inspections to ensure that it is safe from face collapse, either on the bench, or from an adjacent bench.
- Ensuring that the Shotfiring rules are adhered to, including those rules for dealing with misfires – they must at least check and authorise the rules by signing them.
- Reviewing the Shotfiring rules.
- Review and countersign the blast specification before charging begins.
- Ensuring that all personnel upon whom shotfiring rules impose duties have received the latest copy and have understood, accepted, and signed their copy of the rules. A copy of the signed acceptance should be kept. It is acceptable for new rules to be briefed to a group provided that each individual sign to acknowledge that they have read, understood, and accept the rules.
- Communicating production planning (what faces will be blasted or developed during the coming weeks) to the Explosives Supervisor during post blast discussion.
- The Quarry Manager must make sure that these plans are in line with quarry development plans and geotechnical assessments. The Explosives Supervisor must be given the opportunity to raise potential issues arising from site blasting experience and this must be taken into consideration.
- Provide the Explosives Supervisor with any quarry specific risk assessment applicable to drilling and blasting operations and ensure that risk assessments are in place for all blasting activities, even though they may be assessed by others.
- Implementing the Misfire Procedure in conjunction with the Explosives Supervisor.
- To make any public notifications, internal quarry notifications and to place any signs as required in these rules. If this is delegated, they must ensure that it has been done.
- For each blast, to select sentries and brief them of their location and specific duties for that blast. Ensure that they have a radio and understand their specific duties. Ensure that they can communicate with all the sentries and the shotfirer.
- To ensure that no person is left in the danger zone once sentries are in position. Only the shotfirer and those personnel with specific duties in the clearance procedure enter the danger zone at this time.
- To only give the instruction to the shotfirer that he may fire the shot when the danger zone is secure and clear as per the procedure in these rules.
- If anyone gives the STOP, STOP, STOP notice, ensure that the Shotfirer confirms this. If not, repeat the notice until the Shotfirer confirms. Once confirmed, investigate the cause and only recommence the procedure once safe.

The Quarry Manager's primary role is to ensure that the blasting danger zone is clear of personnel, secured against entry from outside, and to communicate directly with the shotfirer as per the blasting procedure to allow the safe firing of shots without risk to personnel. In the absence of the Quarry Manager, his duties will be undertaken by the Assistant Quarry Manager.

2.2.2. Explosives Supervisor

Lealt Shotfiring Rules

The person appointed to organise and supervise all work at the quarry involving the use of explosives.

Although more than one person may be appointed as Explosives Supervisor, only one may act in this role at any time. This is controlled by completion of the 'Explosives Supervisor Register'. This must be completed and then signed by the acting Explosives Supervisor and Quarry Manager.

Key Responsibilities:

- To ensure that explosives are handled and used in a manner that is without risk to the health and safety of personnel in the vicinity and bring anything which may adversely affect this to the Quarry Manager's attention immediately.
- An adequate written blast specification is produced for each blast - prepared by themselves or the shotfirer. This is evidenced by the Explosive Supervisor signing at least the cover sheet and proposed explosives loading sheets prior to charging operations commencing.
- Review and discuss the blast specification with the Quarry Manager before charging begins.
- Making all explosives appointments on site (except Explosives Supervisors and Sentries).
- Check that the equipment provided for Shotfiring is suitable and safe.
- Check that site conditions are in line with the blast specification before work with explosives begins.
- Providing feedback to the Quarry Manager of any information gained during blasting activities (experience gained from previous blasts) that may affect safety, other operations, or quarry planning / design.
- Defining the danger zone required for **each blast**. This may be a standard danger zone for blasting but must be reconsidered for every blast when approving the blasting specification, or if notified of any change during charging notified by the Shotfirer. The extent of the danger zone and position of any safe areas must be notified to the Quarry Manager before charging commences and prior to clearing the danger zone in the event of changes in conditions as a result of actual charging.
- Alterations to the blast specification **must be reviewed and countersigned** by the Quarry Manager.
- Implementation of the misfire procedure in conjunction with the Quarry Manager.
- Undertaking audits of procedures.

2.2.3. Shotfirers

Key Responsibilities:

- Marking out shots prior to drilling.
- Ensure that the proposed blast location, and access to it, is suitable, prior to the shot being marked.
- Surveying shots, or ensuring information provided by a separate surveyor is adequate for use preparing the blasting specification.
- Preparing an adequate blast specification as defined in the Quarries Regulations 1999.
- Transporting explosives on-site.
- Maintaining security of explosives and control of the blast site as a restricted area.
- Check that equipment used for shotfiring is suitable and safe and site conditions are in line with the blasting specification before work with explosives begin.
- Prepare primers with detonators.
- Charge and stem holes as per the agreed specification, or within the agreed allowable variation of **+10% or -100%**, **all additional changes must be agreed by the Explosives Supervisor**. They must obtain approval from the Explosives Supervisor for any changes outside the allowable variation, or changes to any conditions since the approval of the specification.
- Link, connect or otherwise prepare the initiation system ready for firing.
- Inspect and test the initiation system as appropriate for the type being used.
- Liaise with the Quarry Manager to ensure that the danger zone is clear before testing any live initiation system.
- Where electronic or electric detonators are used, ensure they have been correctly connected to the Shotfiring system or circuit and that the system or circuit is tested with a suitable instrument for the purpose from a position of safety.
- Fire the shot from a safe designated location. i.e.: in a shotfiring shelter or outside the danger zone.
- Carryout post-blast inspections to check for misfires.
- Supervise Trainee Shotfirers under direct close personal supervision

2.2.4. Trainee Shotfirer

Trainee shotfirers must only undertake shotfiring activities under the close personal supervision of the shotfirer. They must be following a training programme of practical instruction by the Shotfirer.

Lealt Shotfiring Rules

2.2.5. Explosives Storekeeper

No Explosives Storekeeper at this quarry.

2.2.6. Laser Surveyor

The laser surveyor is responsible for carrying out face profiling using laser profiling equipment, and hole surveying using either manual method or a probe. In addition, the surveyor is responsible for preparing face profiles, sections, plans and elevations as required by the Shotfirer or Explosives Supervisor.

They must only use equipment that is within calibration and when conditions are suitable to allow a survey to be carried out and used as part of a compliant blast specification as required by the Quarries Regulations 1999.

Pre-drill survey should be carried out where practicable. They can be used to make fine adjustments to the planned shotholes before drilling commences. However, it is important to remember that the face should be free from obstruction during this process. Using azimuth markers and located hole markers, individual holes can be adjusted for angle, direction, and depth. This process will allow the optimum burden to be maintained for each hole. And allow hole angle and azimuth to be changed to suit individual quarry requirements, allowing the optimum burden to be achieved.

Post drill surveys are used to provide accurate profile information based on actual hole angles, azimuth markers and collar positions. This will provide the most accurate data to produce the individual hole profiles. It is important that the face profiler can see the full face and where possible, at least three of the permanent survey stations, this will allow a three-station resection to be carried out, which will enable residuals and spread of heights to be calculated. This is a simple method of ensuring the laser equipment is operating within accepted industry tolerances, which are: Residuals – less than 0.30m; and Spread of heights – less than 0.50m

In order to produce accurate profile information, it is essential that each hole is checked for angle, azimuth, hole depth and water depth, and the information is recorded. This information should be checked by the shotfirer or face profiler responsible for the blast. Hole angle and azimuth should be checked, in the first instance, using a torch and handheld inclinometer. This will show whether the hole deviates or must be checked using an electronic down the hole system. Where hole deviation is expected or known, or where the hole contains significant amounts of water, then an electronic measuring system must be used. The electronic systems require a calibration certificate and should be inspected for damage and wear & tear immediately before use.

To comply with the QR Appendix 2, all holes must be checked, and the information recorded. Individual collar positions must be recorded, this is normally carried out using a GPS or a ranging staff fitted with a staff bubble for all front row, azimuth markers, back rows and toe holes drilled.

Key Responsibilities:

- Ensure the working face and open end are clear of loose material and rock traps.
- Ensure sufficient survey location(s) are set up to adequately cover the blast area.
- Relate the survey position to a datum reference (GPS or Quarry Stations).
- Locate, check, prepare, set up and adjust the profiling equipment for the work activity.
- Identify and record physical features of the survey site.
- Locate drilled hole position, hole azimuth, angle and depth for all drilled holes.
- Scan face at least one hole spacing beyond first and last holes.
- Use 3D profiling software to process and evaluate profile data produced.
- Where the shothole has a free face in front and to the side it, an additional profile must be produced at right angles to the hole azimuth.
- Record and report results to relevant persons according to work requirements.
-

2.2.7. Driller

All plant will be loaded and off-loaded on firm level ground (a slight slope to lessen the angle of the ramps is preferable) in a designated area, or away from the main working areas and access routes. The final approval of the location should be made between the Quarry Supervisor, Low-loader Operator and Driller

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- this may form part of the risk assessment process, with an area being specified as a control measure. If necessary, the area may need to be demarcated with cones.

All drill rigs will be loaded and off-loaded by a competent driller, appointed in operating such plant. The mast and other moveable parts should be secured in their travel positions, and the rigs configured as per the manufacturer's recommendations. Where rigs have more than one travel configuration, the optimum option should be discussed with the low-loader driver and may be dependent on the route to be taken and any height restrictions.

Only approved and suitable low-loaders should be used. These should be as follows:

- The deck of the trailer should be made of, or covered in, a suitable material to avoid slipping e.g. wood or rubber matting - this is especially important at the top or ramps where tracks have least contact with the trailer.
- Any ramps should not be too steep, again non-slip and be securely fastened to the trailer to prevent them being thrown out of place by the weight and movement of the plant.
- The trailer should be of appropriate size for the plant being loaded.

The Driller must be provided with drilling instructions by the Shotfirer or Explosives Supervisor, as required by the Quarries Regulations 1999, Appendix 2 - Blasting specification. This comprises of the intended hole positions, marked on a drilling plan, showing the length, diameter and the angle of inclination and direction at which the drill is to be set for each hole, plus the surface position and number or other identifier for each shot-hole. The holes will be numbered right to left when viewed from the quarry top.

The Driller's log shall instruct the driller on hole location, diameter, depth and inclination and azimuth. These details will be entered on the driller's instructions to serve as a reference for the intended drilling geometry to those concerned with it.

Drillers are responsible for drilling holes as per the driller's log instruction and within limits of allowable variations contained in these rules. They must:

- Ensure that all cavities, obstructions, clay bands, basalt and other geological features that may affect the shot encountered during drilling are recorded on the drill log.
- If there is not adequate lighting, then all operations will cease during poor visibility and darkness
- Report to the Explosive Supervisor should they be unable to drill any shot hole as indicated on the drill log, or within the allowable variation allowable in these rules.
- Report to the Shotfirer or Explosive Supervisor if cavities, caves, holes, whether in-filled by clay or empty, are seen in the face or as a surface expression on the quarry top.
- Check the hole depth with a tape measure to check the depth is correct and cover if required.

No drilling is permitted adjacent to charged holes where any part of the hole is within 10m of a charged hole without the completion of a specific activity plan and risk assessment for the activity (approved by the Explosive Supervisor).

2.2.8. Mobile Explosives Manufacturing Unit (Bulk Emulsion Truck Operator)

The operators of mobile explosives manufacturing unit must act under the direct control of the Shotfirer when charging shot-holes, or at any time when working in the shot area.

Key Responsibilities:

- Only load shot-holes under the direct personal supervision of the Shotfirer. This can include loading primers if agreed with the shotfirer.
- Where the explosives column has risen too high in the shot-hole surplus explosives are removed by the approved product removal tool carried on the truck or by means of compressed air or water from the truck.
- Explosives mixing trucks must be earthed during mixing and transfer operations to dissipate static charges.
- At the end of charging, the delivery pipe is cleaned to atmosphere.
- When shot holes are charged with bulk emulsion explosives with gassing agents, that the shotfirer is advised to allow sufficient time for gassing (minimum 15 minutes).

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2.2.9. Blast Sentry

The primary role of the blast sentries is to guard a position to prevent access to the blasting danger zone from the time they are positioned until relieved by the 'all clear'.

Sentries will be briefed on their specific role for each blast by the Quarry Manager. They will be given clear instructions, informing them of their duties and responsibilities and where they must position themselves for the blast.

- They must ensure that they are in position in sufficient time to clear their area of responsibility, take up position and bar entry to the danger zone.
- They must ensure that they understand the method of communication.
- They must be in contact with the Quarry Manager and Shotfirer and when asked to do so, report that they are in position and that their area of responsibility is secure, or not.
- Immediately report to the shotfirer, if at any stage the danger zone is breached, or there is some other matter affecting the safety of the blast. Call **STOP, STOP, STOP** at any time to postpone firing.
- Stay in position when the shot is fired and bar all entry to the danger zone until the 'all clear' signal is sounded, and you are relieved by the Quarry Manager by radio. If in doubt **stay in position** and contact the Quarry Manager.

2.2.10. Handle explosives

This appointment is specifically for those employees required to assist the Shotfirer in moving explosives within the quarry. Those appointed to handle explosives are only permitted to do so as directly instructed and under the close control of the Shotfirer, e.g. carry boxes of explosives from an explosive transport vehicle to the shot hole.

2.2.11. Transport Explosives

This appointment is specifically for those employees required to transport explosives within the quarry. Those appointed to transport explosives are only permitted to do so at the specific request from the Shotfirer in moving explosives within the quarry.

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3. General Rules

3.1. Restricted Working Area

The area where explosives are being used should be controlled as a restricted area and be under the constant supervision of either the Shotfirer, or another appropriate person if no charging is being undertaken. Access to this area should be restricted to those personnel directly involved in the operations and with the permission of the Shotfirer (verbal permission is adequate).

Signs and or cones must be placed at the entrance to the top of the shot and on the quarry bench below to warn people and prevent access to the blast site by unauthorised personnel and general quarry traffic.

3.2. Working under faces

Extra caution is required when work needs to be undertaken below a quarry face. This includes toe holes and production holes which might be at risk from material falling from above. This should be risk assessed by the Quarry Supervisor and personnel involved.

The conditions must be re-assessed each day and any changes reported to the site supervisor. Any instructions arising from the risk assessment must be adhered to before work continues.

3.3. Edge Protection

Edge protection in the designated shotfiring area will consist of a suitable bund along the entire length of the crest/shot. This bund must be in place prior to marking out the shot and the drilling area will be additionally bunded on all sides to prevent vehicular access.

- Where only people or tracked equipment is present this must be at least one metre high.
- Where access is required by wheeled vehicles within 5m of the face, a specific risk assessment must be carried out by the quarry operator or where wheeled vehicles are perpendicular to the face e.g.

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bulk emulsion trucks, the bund must be a minimum of 1.5m, or half the wheel height, whichever is greater.

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4. Explosives Custody

The Explosives Regulations 2014 (Part 11 – Security of Explosives, Traceability, Records and Reporting Loss (Reg. 33-37)) requires records to be kept about explosives throughout the supply chain and life cycle. These records must be kept for a period of three years from date of use, transfer to another person or destroyed (Reg 35(6))

Explosives will be either in the locked explosives magazine or under the constant supervision of an appointed person. Supervision does not imply use and the explosives may be supervised by an Explosives Supervisor, Shotfirer or Trainee Shotfirer.

Explosives deliveries will only be received by the Explosives Supervisor, Shotfirer or Trainee Shotfirer under their control at all times.

Explosives types and quantities supplied must be checked against the order and delivery note by the appointed person, before signing for the delivery. This should include a check that the boxes are within their use-by date, sealed and labelled. The delivery shall be recorded in the Explosives Record book as soon as practicable.

Explosives will be transferred to a suitable vehicle and always remain under constant supervision of an appointed person.

Detonators and explosives materials will only be removed from the manufacturers' container immediately before use.

All boxes will be checked to ensure they contain no explosives residue and stored of the immediate blast area before burning after the blast.

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5. Shotfiring Equipment

Only approved equipment and tools shall be used for shotfiring operations. All equipment shall be maintained in good condition and be suitable for the task.

Equipment must be tested / checked and assessed as per the requirements of the Quarries Regulations.

- Exploders and circuit-testers must be tested every 6 months, this will be evidenced by certificates kept on site
- Laser profiling equipment, electronic probes and vibrographs, will be tested every 12 months. This will be evidenced by certificates kept on site.

All equipment will be tested following any major repair or failure, or for exploders, following an unexplained misfire. All such records will be kept for a minimum of 3 years.

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6. Control of Bulk Emulsion Trucks

The Quarry Manager must ensure that:

- Before authorising the use of bulk emulsion truck explosives an inspection of the route to, and the blasting site itself, is carried out to ensure that the gradient, width, surface, and bunds are all in order for the safe access and operation of the truck.
- Arrangements are in place to carry out site inductions, advise on emergency procedures, issue workplace and shotfiring rules and complete the control of contractor's paperwork.
- When the truck arrives on site, arrangements are in place for a responsible person (Explosives Supervisor or Shotfirer) to take charge of the truck, ensure that the checking in and out procedure is understood and being followed and that all operatives have had site inductions and are appointed in writing.

The Shotfirer must ensure that:

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- The truck only operates at the blast site area within the previously determined safe boundaries and under no circumstances is it allowed to operate in the area between the line of the first row of shot-holes and the quarry face.
- Where bulk explosives are mixed and pumped directly into the shot-holes the rise of explosive is recorded on the charging sheet. In all cases the hose must be inserted into the hole in accordance with the suppliers' procedures.
- The charging hose must be positioned at the bottom of the holes before pumping commences.
- Any deviation from the blasting specification – outside allowable variations - is reported to the Explosives Supervisor for remedial action before charging continues.

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7. Explosive Products

Explosives Supervisors and Shotfirers must ensure that they understand the nature and safe use of each product prior to its use. As a minimum, users should have read the product information provided e.g. Technical Data Sheets and Material Safety Data Sheets from the supplier. Some products may require more specific training e.g. electronic initiation systems. The Explosive Supervisor may contact the manufacturer for additional information.

Copies of the Technical Data Sheets and Material Safety Data Sheets for all explosives products used on site must be stored electronically or kept on-site.

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8. Blasting Times and Audible Warning

The Explosives Supervisor shall ensure that there is sufficient visibility for, preparatory work for shotfiring, the shotfiring operation and any site inspection after the shot is fired so they can be carried out safely. Sufficient time should be allowed for the shot to be charged carefully. Fog, rain, and snow may reduce visibility and make it unsafe to blast. These factors and the normal number of daylight hours available shall be considered as part of the Blasting Specification for each shot by the Explosives Supervisor.

Notification of the intention to blast on a particular day will be given as early as possible by the Quarry Manager, giving the time and location of the blast and danger area. A notice will be put in position on the sign at the entrance to the quarry.

Blasting will take place between 1000hrs and 1700hrs, Monday to Friday. Blasting out with these times is prohibited. Blasting will normally take place between 11am and 3pm.

Audible Warning

The following audible warning will be used:

3

1 min warning

1 x 30 sec blast on sir horn

Fire Blast

All Clear

3 x 10 sec blast on air horn

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9. Site Specific Blasting Environmental Constraints

Ground vibrations are not to exceed a peak particle velocity of 6mms⁻¹ in 95% of all blasts within any 6 month period and no individual blast shall exceed a peak particle velocity of 12mms⁻¹ these factors will be controlled to reasonable levels by blast design and following best practice.

Following the blast, the results of any environmental survey, ground vibration and / or air over pressure effects should be noted along with the date, time, and weather conditions to form part of the blast record. Any complaints should be recorded along with actions taken.

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10. Accidental Initiation

10.1. Electrical Storms

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No part of the initiation system or the explosive charges are immune from the effects of a lightning strike. All charging of shotholes or work involving the making of circuits containing detonators shall cease in the case of electric storms being present in the immediate area. The danger zone will be evacuated, and sentries posted. After the electrical storm has passed, do not return to the site until the Shotfirer and Explosives Supervisor agree it is safe to do so?

10.2. Overhead Power Lines

Where overhead power lines are located within the proposed drilling area, a site-specific additional risk assessment and method statement will be required. The Quarry Manager is responsible for contacting the line owner for additional guidance. Good management, planning and consultation with interested parties before and during any work close to overhead lines will reduce the risk of accidents. This applies whatever type of work is being planned or undertaken, even if the work is temporary or of short duration. The Quarry Operator should manage the risks if they intend to work within 10m, measured at ground level horizontally from below the nearest wire. **See HSE guidance GS6 Avoiding danger from overhead power lines for further information**

10.3. Sharp Stones

Stemming material shall be checked to ensure that large stones have not been included in the material to be employed. The working area shall be cleared of sharp stones as far as possible. Persons on the blast area must avoid standing on detonator wiring or shock tubes.

10.4. Carelessness

Shotfirers must avoid damage that could be caused to electrical connections when using shovels to add stemming to holes.

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11. Blasting Specifications

11.1. Surveying

To enable complete and accurate face surveys to be carried out the face must be cleared of all loose blasted material in the intended blast area. If any material is removed, or falls out of the face, after the survey then the survey should be repeated. Face surveys will be carried out using approved laser equipment (buffer blasts excepted).

All holes will be spray paint marked to identify hole numbers, going from left to right when looking at the face.

The shotfirer will provide the surveyor with details of the shot - number of holes, rows and provide the hole angles, unless the holes are to be probed. If the surveyor is measuring the hole angles with a torch and inclinometer on the behalf of the shotfirer, the shotfirer must communicate any rules relating to the minimum length of holes that must be visible for a measurement to be valid, and details of any other information required.

The surveyor will submit the completed survey to the Shotfirer or the Explosives Supervisor.

The surface position and direction of all holes will be recorded, and part of the printout will include a table showing the surface position of all the holes.

The surveyor will complete the survey and transfer the information to the Shotfirer / Explosives Supervisor who is responsible for confirming the validity of the information. The survey may be left at an agreed location e.g. a box file in the site office.

The surveyor will provide the following as a minimum:

- Profiles landscape with burden master matrix – all holes adjacent to a face.
- Front elevation view for all rows (showing hole to hole distances).
- Side view elevation between holes in different rows (one in front of the other).
- Plan (ideally to scale and showing the burdens and spacings).
- Survey assessment.
- Resection.

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- 3D View.
- Hole Report – this provides co-ordinates of all holes.

11.2. Blast Specification Documentation

Shotfiring operations must only commence when the blast specification is complete and signed. It is preferable that the Shotfirer and Explosives Supervisor roles are carried out by different people, though it is acceptable for the same person to undertake both roles.

The specification will be prepared by the Explosives Supervisor, Shotfirer, or trainee Shotfirer under their supervision. Due to the introduction of advanced software for surveying, marking out shots and blast design, there are currently several ways that the requirements of the Quarries Regulations 1999 blasting specification may be achieved. It is the responsibility of the Explosives Supervisor to ensure that any blasting specification meets these requirements prior to approval.

The blast design must ALSO CONSIDER:

- The geo-technical assessment and the requirements of the approved development plan.
- The excavation and tips rules for the quarry and makes due allowance for local geological conditions.
- Previous blasting experience.

Prior to commencing charging the Shotfirer must sign the blasting specification and transfer it to the Explosives Supervisor. The Explosives Supervisor then checks the blasting specification is complete and adequate and then signs to approve it.

The blast specification must comply with ACOP Appendix 2 parts 1-7, 9 & 10 before charging begins.

The approved blast specification will be held by the person upon whom it imposes duties at that time and will be available on the blast site during charging operations. This is as follows:

| Document | From | To |
|--|--|---|
| Drill log instruction | Shotfirer or trainee Shotfirer, or Explosives Supervisor | Driller to complete |
| Completed drill log | Driller | Shotfirer or trainee Shotfirer, or Explosives Supervisor |
| Survey profiles, plans and other data | Laser Surveyor | Shotfirer or trainee Shotfirer, or Explosives Supervisor |
| Complete proposed blasting specification | Shotfirer after completion and signing | Explosives Supervisor for approval Quarry Manager for review and signature |
| Complete proposed blasting specification | Explosives Supervisor | Shotfirer or trainee Shotfirer for charging |
| Completed actual Blasting Specification | Shotfirer or trainee Shotfirer after firing and completing post blast information. | Explosives Supervisor for review for future blasts |
| Completed actual Blasting Specification | Explosives Supervisor | Quarry Manager for filing |
| The danger zone plan, including sentry positions, should be copied as necessary and given to the Quarry Manager, Sentries and publicised as described in section 16. | | |

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12. Shotfiring Operations

12.1. Charging

The shotfirer must be always present when holes are being charged. Where several Shotfirers are working together, the Shotfirer who has signed the blast specification is the acting Shotfirer for that blast and other Shotfirers are acting under his instruction.

During charging operations, the rise of the explosives in each shot hole must be checked and the information recorded on the loading sheet or blast record book as instructed by the Explosives Supervisor. A suitable measuring tape with non-ferrous weight should be used.

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Where the rise is continuously monitored by contact with the end of the hose and periodically checked with the findings recorded on the loading sheet. Should the rise of explosive cease or a blockage occur, the Shotfirer should consult the Explosives Supervisor. The frequency of checking explosives rise may be increased if there is a known problem with adjacent holes, or geological anomaly (e.g. slightly broken ground). For packaged explosives the rise will be checked at regular intervals as instructed by the Explosives Supervisor

Stemming material must be granular and loaded in such a way to avoid bridging – 8-14mm as agreed

If it is not possible to stem holes as per the specification, or within allowable variations, the Explosives Supervisor must be notified immediately.

The Shotfirer will ensure:

- No detonators or shock tube connectors are used unless they are clearly marked and identifiable.
- Primers are assembled in the approved manner and in accordance with the specification for each shot-hole.
- Particular care must be taken when lowering electronic detonators with primers on plastic reels. Care must be taken that the clip end is not damaged as the reel spins (e.g. the clips on i-kon detonators can be clipped to the side of the reel).
- Under no circumstances are two detonators attached to, or inserted into, a cast primer that is designed to receive one detonator only.
- Only approved non-ferrous tools in good order and free from grit are used when it is necessary to pierce a cartridge.
- Primer cartridges must be carefully lowered, and the position checked against the specification.
- No person forcibly removes any detonator lead, or other system for initiating shots from a shot-hole after the shot has been charged and primed.
- Great care is taken to ensure that all down hole initiating lines are neatly coiled and secured near to the shot-hole collars.
- Detonating cord is only cut with a sharp knife in free air, or on a wooden anvil, or using specialist cutting equipment designed for this purpose.
- The Shotfirer must be fully satisfied that each shot-hole has been charged in accordance with the blasting specification and that the loading horizons and charge weights for each shot-hole have been accurately recorded.
- Detonators, other explosives or charged holes are not left unattended.
- That there is no smoking or naked flame within 10 metres of any explosives or detonators.

Where practicable, all chippings for stemming and cover material for the shock tube connectors is placed near each shot-hole prior to charging taking place and the Shotfirer personally checks that all stemming material complies with the blasting specification.

12.2. Connecting the initiation system

The Shotfirer must ensure that:

- All charged shot-holes are connected in accordance with the initiation plan in the specification.
- All detonators are connected to the harness wire, circuit, or other shock tube detonator as per the manufacturer's recommendations.
- Electronic detonators logged to a computer design are connected to the harness wire in the correct sequence as per the design and each detonator is checked with the logger to ensure that it is the correct hole, the detonator has logged and there are no errors.
- Electrical connections are not in contact with the ground and in wet conditions are insulated using tape or other approved methods.
- Shock tube connector blocks are not overloaded with more shock tubes than they are designed for.
- Shock tube connectors are at least 1.2 metres apart and the initiating detonator is at least 1.0m from the connector being fired.
- Kinks in shock tubes, tubes crossing back over the connector block are avoided.
- Before the shock tube connector blocks are covered, the Shotfirer personally carries out a thorough check to confirm that all down-lines are connected into the connector blocks and that all connector blocks are connected into the circuit.
- A second competent person then checks these again by walking the shot prior to firing to ensure all are connected as per the initiation pattern and signs the initiation plan.

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- All shock tube connector blocks are covered with a minimum of 200mm of damp dust or chippings to prevent damage to surface lines by shrapnel.

12.3. Testing the initiation system

The Shotfirer must ensure that:

- The connecting, testing, and firing of shotfiring circuits must only be carried out by themselves, another Shotfirer, or a Trainee Shotfirer under their close personal supervision.
- Only currently certificated testers and exploders must be used.
- When using electronic detonators, once all detonators are logged, the circuit must be tested for leakage and also tested for errors that must be rectified prior to blasting.
- Electric detonators (except electronic detonators) are not connected into a circuit where any possibility exists of a CB radio being operated within 50 metres of that circuit.
- The shotfiring cable is tested for insulation and continuity before being placed into the circuit.
- Connections between the shot firing cable and the detonator circuit are insulated.
- Tests to live circuits are made from the blast shelter when the danger zone is clear.
- The testing of the Non-Electric Exploder will be carried out using an off-cut length of lead in line to ensure that it works.

When in charge of an exploder, the Shotfirer:

- Retains any removable handle or key in their possession throughout the period of duty.
- Where a shock tube-initiating device is used, this is classed as a key and is retained in their possession throughout the period of duty.

The removable handle or key will not be placed in the exploder until the exploder is about to be used by the Shotfirer and it will be removed immediately after firing.

12.4. Blasting Danger Zone

This Danger Zone is that described in the Quarries Regulations 1999. No personnel are allowed to be in areas demarcated as the danger at the time of firing the shot, except within a suitably located and constructed blasting shelter capable of offering protection from projected rock. The use of RED flags or 'No Entry, Blasting in Progress' signs may be used as appropriate to further demark the area.

The Explosives Supervisor may re-determine the danger zone and muster points at any time either routinely, during the preparation of the blasting specification or due to changes during charging. Any changes must be notified / publicised as described below.

The Danger zone plan for any blast must show the following items:

- The Danger zone boundary.
- The blast location
- The firing position. If this is within the danger zone it must be a suitable blasting shelter.
- Sentry positions with sentry names or numbers clearly marked.
- The 'approved route' for explosives

The Explosives Supervisor and Shotfirer will reassess the suitability of the extent of the danger zone during preparation of the blast specification and again after charging if conditions change, or if charging was different to that proposed. **Any changes to the Danger Zone will be reviewed and countersigned by the Quarry Manager.** Any changes after commencement of the firing procedure will result in a postponement and re-start – with sentries re-briefed as required.

The following factors may be considered (not exhaustive):

- Prevailing face conditions.
- Orientation of the face.
- Past experience in the behaviour of similar blast patterns and blast ratios.
- Knowledge of the local rock formations.
- Information revealed during drilling of the shot-holes.
- Position of blast in relation to site boundary.
- Information from the drilling operation.
- Information from the loading operation including difficulties in charging.
- Degree of throw required/expected.

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- Degree of fragmentation required/expected.

12.5. Firing Procedure

When the shot is ready to be fired, except for the connection of the exploder, the Quarry Manager will be informed by the Shotfirer. The following procedure will be carried out by the Quarry Manager:

1. Personnel are notified of the blast time by their immediate supervisor and will stop work and leave the danger zone, by 15 minutes before the blasting time. All mobile plant will be parked in a safe place.
All sentries, Quarry Manager and shotfirer must be in radio communication at all times.
All communications must be clear. When any message is not clearly understood the safest situation must be maintained – the shot is not fired, or the danger zone is maintained.
2. At 15 minutes prior to blasting the Quarry Manager will instruct or place the sentries to carry out any checks they have been instructed to make and to take up their designated position. At this point the road into the quarry will be closed by an appointed Sentry who will ensure that the quarry floor and surrounding area are clear before closing the road.
3. The Sentries will be positioned as agreed at strategic positions around the quarry and as shown on the Danger Zone plan. To stop the procedure at any time, anyone may call 'STOP, STOP, STOP'. The shotfirer will confirm by saying 'Blast Postponed' and will not fire the shot until the Quarry Manager has determined the reason and re-established control of the danger zone. Any person who is appointed as a Sentry must have full knowledge of the siren procedures and the method for indicating the "all clear". No Sentry shall leave his position until the 'all clear' is sounded or otherwise authorised by the Quarry Manager.
4. At 5 minutes prior to firing the Quarry Manager checks with all the sentries that they are in position and their area is secure. The A855 will be closed both ways at points marked on the danger zone management plan. Once the Quarry Manager has satisfied that danger zone is clear he will notify the Shotfirer. The shotfirer may now carry out any tests/checks requiring the danger zone to be cleared, including charging-up electronic detonators.
5. After the 4 minutes the Quarry Manager checks with the sentries that the danger zone is still secure before instructing the Shotfirer to sound the 1 minute warning.
6. After 1 minute the Quarry Manager gives the Shotfirer authorisation to fire.
7. The Shotfirer fires the shot, waits for the blast fume and dust to clear before carrying out the post-blast inspection. The Shotfirer gives the 'all clear'.
8. The Quarry Manager repeats the 'All Clear' over the radio and 3 short blasts of the air horn are sounded by the Shotfirer. The sentries are then withdrawn.

Until the ALL CLEAR has been given **NO** person or vehicle traffic may return into the danger zone unless specifically authorised by the Explosives Supervisor.

12.6. Post Blast Inspections

After the shot is fired:

- Remove the key from the exploder or personally retain the shock tube initiating device.
- Disconnect the shotfiring cable from the exploder as appropriate.
- Wait for the dust and fumes to disperse.
- The shotfirer will inspect the blast site to check for misfires and the state of the face for overhangs and loose boulders. He will ensure that all precautions are taken during this exercise to avoid harm to himself.
- Only when he has satisfied himself that it is safe should he give the "ALL CLEAR".

The 'All Clear' signifies that the blast has fired, that the danger zone is no longer required, the A855 can be re-opened and normal work may resume. Immediately following this the Shotfirer should notify the Quarry Manager if any remedial work is required to make the face safe. The Quarry Manager will then

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communicate this to site operatives as required to ensure that the face is made safe before loading commences.

Indications of a misfire can include:

- Top of blasthole still intact with initiating system apparently undisturbed
- Inadequate ground movement
- Undisturbed ground or lack of fracturing
- Poor fragmentation and movement in certain areas of the shot outside the normal expected results
- Irregular shape of rockpile
- Hard digging
- Evidence of undetonated explosives
- Hang-ups on the face
- Unusual blast sound.
- Adverse readings when testing electrical or electronic initiation systems

12.7. Flyrock

If there has been an instance of fly rock or unexpected scatter of rock within the danger zone, this must be reported to the Quarry Manager as soon as possible.

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13. Safeguarding shots overnight

The Shotfirer must ensure that the Explosives Supervisor and Quarry Manager are informed as soon as it becomes apparent that the shot cannot be fired within permitted times.

The Quarry Manager must ensure that when a shot is being left overnight it must be guarded by a Shotfirer and additional site personnel as required to secure the immediate blast area. Additional lighting may be required.

General:

- All charged shot holes will be completed and stemmed to prevent any of the detonators / explosives being removed from the column and provide protection against vandalism.
- No surface connector detonators are left attached.
- All in-hole detonator tubes/wires will be suitably anchored. This would normally be done by wrapping the loose ends around a large rock to ensure that they are not pulled into the stemming if the column settles whilst being slept.
- The blasting record is completed, and all unused explosives, detonators and accessories are returned to the explosives store or under the constant supervision of a Shotfirer.
- Notices / barriers / RED flags may be used to inform personnel that a danger exists. All entry points onto the bench containing the charged holes are coned off to restrict access and to demark the area that is being left charged; only authorised personnel are allowed to enter the coned area.

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14. Destruction of surplus explosives

It is now most often the case that blasting is undertaken on sites where no explosives storage exists and the requirement for each blast is ordered for delivery directly by the supplier on the day of the blast. It is therefore necessary for the Shotfirer to calculate and order sufficient explosives of the correct type, and some additional items to cover changes in circumstances e.g. additional primers and detonators, or more waterproof explosives. Explosives Regulations 2014, Regulation 28 provides guidance on how to deal with this surplus in a safe and practical way.

In general, where it is safe to do so, all explosives and accessories delivered to the quarry are used or destroyed in the blast or by burning after the blast. These details and use must be recorded in the completed blast specification.

There are many aspects of the disposal and destruction of explosives that can have an impact on the environment, directly or indirectly, and which may be subject to statutory control, for example - contamination of land, surface water and groundwater. Destruction in blast holes or burning on a quarry floor are unlikely to cause any problems.

Lealt Shotfiring Rules

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15. Misfires

The following procedure should be followed in the event of any type of misfire occurring or being discovered during shotfiring operations, inspecting the face or loading the rock-pile. The Explosive Supervisor and Quarry Manager must be informed by the quickest possible means on the discovery of a misfire.

A misfire is defined in Quarry Regulations 1999, Regulation 2 as follows:

Type A: 'testing before firing reveals broken continuity which cannot be rectified.'

Type B: 'a shot or any part of a shot fails to explode when an attempt is made to fire it.'

Quarries Regulations 1999, Regulation 28 requires that;

In the event of a misfire the operator shall (if this is not the same person) consult the individual appointed under regulation 8(1)(c) and shall ensure, so far as is reasonably practicable, that –

- (a) *apart from himself, no person other than the Explosives Supervisor, shotfirer, trainee shotfirer or any other person authorised by him enters the danger area –*
 - (i) *where the shot was fired by means of safety fuse, until a period of 30 minutes has elapsed since the misfire, or*
 - (ii) *where the shot was fired by other means, until a period of 5 minutes has elapsed since the misfire and any shotfiring apparatus has been disconnected from the shot;*
 - (b) *appropriate steps are taken to determine the cause of and to deal with*
 - (c) *a suitable record is kept of the misfire.*
- The Quarry Manager and Explosive Supervisor must attend the scene with the Shotfirer as soon as possible, being in possession of:
 - The blast specification
 - These rules
 - The MPQC, Explosives at Quarries, Guidance Note 1 2020 – Misfires
 - Camera

The course of action to be taken to deal with the misfire will be agreed between the Explosive Supervisor, Quarry Manager and Shotfirer with reference to the MPQC Misfires - Guidance Note 1 2020. The explosives supplier may need to be contacted for further information or advice.

It should be remembered that there are many potential causes of misfires and many different circumstances and situations in which a misfire could occur. It is impossible to define a precise course of remedial action until the misfire site has been inspected, a robust risk assessment must be undertaken, and method statement should be prepared.

The misfired material may be required for further investigation, speak with HSE & explosives supplier for clarification before destroying this material. Under no circumstances should detonators be removed from primers as there is a potential for unintended initiation.

- Every effort shall be made to discover the cause of the misfire and the following should be recorded and placed with the blast specification.
 - Who discovered the misfire
 - Date and time of discovery
 - Photographic evidence
 - Procedure adopted to deal with the misfire
 - The cause of the misfire (if known)
 - Date when the misfire was satisfactorily dealt with
 - Modifications necessary to existing procedures as a result of the investigation.
 - Complete blast specification (if available)
 - Copy of the RIDDOR report

Misfires are classed as a dangerous occurrence under RIDDOR and will be reported to the HSE by the Area Health & Safety Advisor on behalf of the Quarry Manager.

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Lealt Shotfiring Rules

16. Compliance and Auditing

16.1. Understanding of the rules

The Quarry Manager shall take reasonable steps to ensure those receiving these Shotfiring Rules, clearly understand their duties and responsibilities.

16.2. Monitoring & Review

The Quarry Manager and Explosives Supervisor will carry out a blasting operations audit at intervals not greater than 12 months. The findings of the audit will be the subject of a separate report prepared by the auditor.

The audits and spot checks are designed to confirm that:

- Those involved in the operation understand the requirements of the Shotfiring rules and are complying with them.
- They continue to be practical and workable.
- Changes necessary to accommodate altering circumstances and statutory requirements are introduced.

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Signed on behalf of the Operator:

Quarry Manager

Date _____

Signed: Explosives Supervisor

Date _____

Lealt Shotfiring Rules

APPENDIX 1: Appointment of Explosives Supervisor

Name.....

Under Regulation 25(1)(b) of the Quarries regulations 1999, you are appointed as an Explosives Supervisor at **Lealt** Quarry. As such you are the person in overall, day-to-day, charge of work with explosives at the quarry. You must be familiar with and ensure compliance with Part V, Explosives, of the Quarries Regulations 1999, the Approved Code of Practice, and the Shotfiring Rules for the quarry.

You are required to ensure that:

- All appointments of shotfirers, trainee shotfirers, storekeepers and other persons involved in the drilling and blasting process are made in accordance with the Shotfiring Rules for the quarry.
- An adequate written specification (whether produced by you or not) is prepared for each shotfiring operation at the quarry to ensure, so far as is reasonably practicable, that when such firing occurs it will not give rise to danger.
- A copy of the above specification is given to any person upon whom it imposes duties.
- Explosives are handled and used in a manner that is without risk to the health and safety of personnel in the vicinity and bring anything which may adversely affect this to the Operator's attention immediately.
- The Quarries Regulations 1999, Part V Explosives are complied with.
- Equipment used for Shotfiring is suitable and safe and site conditions are in line with the blast specification before work with explosives begins.
- Shotfiring operations are carried out safely and in accordance with the Shotfiring Rules for the quarry.
- All explosives are stored, transported, and used safely and securely.
- Only authorised persons carry out work with explosives.
- Only one appointed explosives supervisor is responsible at any one time by checking and maintaining the Explosives Supervisors Register.

The Explosives Regulations 2014, make it an offence for a "prohibited person" to:

- Acquire, keep, handle or have control any relevant explosive or any restricted substance.
- Being knowingly employed in a position where they handle or had control of relevant explosives or any restricted substance.
- Be involved in direct handling of relevant explosives (e.g. manufacture, transport, storage and use), are covered; also covered are those persons involved in indirect control (e.g. supervising or organizing movements of relevant explosives).

Prohibited persons include:

- Anyone ever convicted of any offence under the Explosive Substances Act 1883
- Any person who has been subject of a sentence that is excluded under the Rehabilitation of Offenders Act 1974
- Anyone ever convicted of any offence in the last 7 years and sentenced to a term of imprisonment exceeding thirty months
- Anyone convicted of any offence in the last 4 years and sentenced to a term of imprisonment exceeding six months
- Anyone convicted of any offence in the last 2 years and sentenced to a term of imprisonment of less than six months
- Has served a period of service detention in HM Armed Forces in the last 12 months

If at any time you are unable to properly discharge your responsibilities, you are required, without delay, to bring the matter to the notice of the senior manager in the Management Structure, responsible for this appointment.

Area General Manager Signed.....Date.....

I confirm that I understand my duties under this appointment and that I am not a prohibited person as defined in the Explosives Regulations 2014 as set out above.

Appointee..... Signed.....Date.....
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Lealt Shotfiring Rules

APPENDIX 2: Appointment of Shotfirer

Name.....

Under Regulation 25(2)(a)(ii) of the Quarries regulations 1999, you are appointed as Shotfirer at **Lealt Quarry**. As such you are the person in charge of shotfiring operations. You must be familiar with and ensure compliance with Part V, Explosives, of the Quarries Regulations 1999, the Approved Code of Practice, and the Shotfiring Rules for the quarry.

You are required to ensure that:

- All shotfiring operations are conducted in accordance with the shotfiring rules and the blasting specification.
- The angle of inclination, direction, length and diameter and the extent of any sub-grade drilling for each completed shothole.
- Each shot hole has been charged in accordance with the blasting specification.
- Shotfiring operations are suspended until changes are authorised by the designer or other designated person, if it is not possible to conform to the specification or the danger zone differs from that shown.
- Any trainee Shotfirers are kept under close personal supervision until their training is deemed to be complete and the necessary level of competence has been acquired and demonstrated.
- Check the shotfiring system or circuit to ensure that it has been connected correctly.
- Where electrical detonators are used, ensure they have been correctly connected to the Shotfiring system or circuit and that the Shotfiring system or circuit is tested with a suitable instrument for the purpose from a position of safety as to make a misfire unlikely.
- Ensure that all shots are fired from a safe place.
- An inspection of the blast site is carried out after firing to check the state of the face and whether a misfire has occurred.

The Explosives Regulations 2014, make it an offence for a "prohibited person" to:

- Acquire, keep, handle or have control any relevant explosive or any restricted substance.
- Being knowingly employed in a position where they handle or had control of relevant explosives or any restricted substance.
- Be involved in direct handling of relevant explosives (e.g. manufacture, transport, storage and use), are covered; also covered are those persons involved in indirect control (e.g. supervising or organizing movements of relevant explosives).

Prohibited persons include:

- Anyone ever convicted of any offence under the Explosive Substances Act 1883
- Any person who has been subject of a sentence that is excluded under the Rehabilitation of Offenders Act 1974
- Anyone ever convicted of any offence in the last 7 years and sentenced to a term of imprisonment exceeding thirty months
- Anyone convicted of any offence in the last 4 years and sentenced to a term of imprisonment exceeding six months
- Anyone convicted of any offence in the last 2 years and sentenced to a term of imprisonment of less than six months
- Has served a period of service detention in HM Armed Forces in the last 12 months

If at any time you are unable to properly discharge your responsibilities, you are required, without delay, to bring the matter to the notice of the senior manager in the Management Structure, responsible for this appointment.

Explosives Supervisor..... Signed.....Date.....

I confirm that I understand my duties under this appointment and that I am not a prohibited person as defined in the Explosives Regulations 2014 as set out above.

Appointee.....
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Signed.....Date.....

Lealt Shotfiring Rules

APPENDIX 3: Appointment of Trainee Shotfirer

Name.....

Under Regulation 25(2)(a)(ii) of the Quarries regulations 1999, you are appointed as Trainee Shotfirer at **Lealt** Quarry. As such you must only carry out shotfiring operations under the close personal supervision of the site shotfirer until it is deemed that your training is complete, and you can demonstrate that the necessary level of competence has been acquired. You must be familiar with and ensure compliance with Part V, Explosives, of the Quarries Regulations 1999, the Approved Code of Practice, and the Shotfiring Rules for the quarry.

You are required to ensure that:

- You are NOT required to fire shots except under the close personal supervision of a shotfirer, until the operator is satisfied that he/she has completed a suitable period of training and has appropriate practical experience.
- You only work under the close personal supervision of an experienced shotfirer.
- You comply with the Shotfiring rules relating to the storage, handling & use of explosives.
- You are in possession of suitable written training programme

The Explosives Regulations 2014, make it an offence for a "prohibited person" to:

- Acquire, keep, handle or have control any relevant explosive or any restricted substance.
- Being knowingly employed in a position where they handle or had control of relevant explosives or any restricted substance.
- Be involved in direct handling of relevant explosives (e.g. manufacture, transport, storage and use), are covered; also covered are those persons involved in indirect control (e.g. supervising or organizing movements of relevant explosives).

Prohibited persons include:

- Anyone ever convicted of any offence under the Explosive Substances Act 1883
- Any person who has been subject of a sentence that is excluded under the Rehabilitation of Offenders Act 1974
- Anyone ever convicted of any offence in the last 7 years and sentenced to a term of imprisonment exceeding thirty months
- Anyone convicted of any offence in the last 4 years and sentenced to a term of imprisonment exceeding six months
- Anyone convicted of any offence in the last 2 years and sentenced to a term of imprisonment of less than six months
- Has served a period of service detention in HM Armed Forces in the last 12 months

If at any time you are unable to properly discharge your responsibilities, you are required, without delay, to bring the matter to the notice of the senior manager in the Management Structure, responsible for this appointment.

Explosives Supervisor..... Signed.....Date.....

I confirm that I understand my duties under this appointment and that I am not a prohibited person as defined in the Explosives Regulations 2014 as set out above.

Appointee..... Signed.....Date.....

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Lealt Shotfiring Rules

APPENDIX 4: Appointment of Explosives Storekeeper

Name.....

Under Regulation 25(2)(a)(ii) of the Quarries regulations 1999, you are appointed as Explosives Storekeeper at **Lealt** Quarry.

All operations are carried out in accordance with:

- Quarries Regulations 1999
- Explosives Regulations 2014
- Site Shotfiring Rules

You are required to ensure that:

- Keys to the store are always kept in a secure location.
- Explosives are only kept in the approved store unless they are being transported or are being used and accurate records are maintained.
- Only authorised persons are issued with explosives.
- Stock is checked to ensure that the totals of items that have been used on that day are correct. Total stock checks are done and recorded in the book on a regular basis.
- Any loss or theft of explosives is reported to the designated person immediately.
- Regular checks on the condition of the store, locks and alarm are carried out and recorded.
- Ensuring that stock levels do not exceed those allowable on any licence or acquire and keep certificate
- Ensuring that the inside of the store is kept clean and free from grit at all times and nothing, but explosives shall be stored in the magazine, except essential non-ferrous items e.g. broom.
- Keeping the area surrounding the explosives store clear of grass, shrubbery, spilled fuel oil, or other organic material to minimise the risk of fire.

The Explosives Regulations 2014, make it an offence for a "prohibited person" to:

- Acquire, keep, handle or have control any relevant explosive or any restricted substance.
- Being knowingly employed in a position where they handle or had control of relevant explosives or any restricted substance.
- Be involved in direct handling of relevant explosives (e.g. manufacture, transport, storage and use), are covered; also covered are those persons involved in indirect control (e.g. supervising or organizing movements of relevant explosives).

Prohibited persons include:

- Anyone ever convicted of any offence under the Explosive Substances Act 1883
- Any person who has been subject of a sentence that is excluded under the Rehabilitation of Offenders Act 1974
- Anyone ever convicted of any offence in the last 7 years and sentenced to a term of imprisonment exceeding thirty months
- Anyone convicted of any offence in the last 4 years and sentenced to a term of imprisonment exceeding six months
- Anyone convicted of any offence in the last 2 years and sentenced to a term of imprisonment of less than six months
- Has served a period of service detention in HM Armed Forces in the last 12 months

If at any time you are unable to properly discharge your responsibilities, you are required, without delay, to bring the matter to the notice of the senior manager in the Management Structure, responsible for this appointment.

Explosives Supervisor..... Signed.....Date.....

I confirm that I understand my duties under this appointment and that I am not a prohibited person as defined in the Explosives Regulations 2014 as set out above.

Appointee..... Signed.....Date.....
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Lealt Shotfiring Rules

APPENDIX 5: Appointment of Laser Surveyor

Name

You are hereby appointed as a Laser Surveyor at **Lealt** Quarry. The Operator has the overall responsibility to co-ordinate all activities on site including those involving the use of explosives. The Explosives Supervisor has overall, day-to-day, charge of work with explosives at a quarry. You shall always liaise with the Operator and Explosives Supervisor as a matter of course.

You are required to ensure that:

- The Quarries Regulations 1999, Part V Explosives are complied with.
- The angle of inclination, direction, length and diameter and the extent of any sub-grade drilling for each completed shot hole.
- Surveying of faces and holes is carried out in a manner that minimizes all risks to quarry operations and bring anything which may adversely affect this to the attention of the Quarry Manager immediately.
- Ensure the working face and open end are clear of loose material and rock traps.
- Ensure sufficient survey location(s) are set up to adequately cover the blast area.
- Relate the survey position to a datum reference (GPS or Quarry Stations).
- Locate, check, prepare, set up and adjust the profiling equipment for the work activity.
- Identify and record physical features of the survey site.
- Locate drilled hole position, hole azimuth, angle, and depth for all drilled holes.
- An adequate series of profiles and plans are produced for each blast as required by the Shotfirer or Explosives Supervisor to allow a compliant blasting specification to be produced.
- Equipment used for surveying is suitable and suitably calibrated.
- Site conditions are in-line with the drillers log before work begins.
- Completed documents are transferred to the Explosives Supervisor at the earliest opportunity.
- You inform the explosives supervisor and / or the site manager if you come across anything that may compromise the safety of the blast, within your remit as a surveyor.

If at any time you are unable to properly discharge your responsibilities, you are required, without delay, to bring the matter to the notice of the senior manager in the Management Structure, responsible for this appointment.

Explosives Supervisor..... Signed.....Date.....

I confirm that I understand my duties under this appointment.

Appointee..... Signed.....Date.....
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Lealt Shotfiring Rules

APPENDIX 6: Appointment of Driller

Name.....

You are hereby appointed as a Driller at **Lealt** Quarry. The Operator has the overall responsibility to coordinate all activities on site including those involving the use of explosives. The Explosives Supervisor has overall, day-to-day, charge of work with explosives at a quarry. You shall always liaise with the Operator and Explosives Supervisor as a matter of course.

You are required to:

- Unload & load drill rig in the designated area, with suitable segregation from site traffic.
- Use only approved low loaders for transportation.
- Comply with the site vehicle rules.
- Comply with the shot firing rules.
- Comply with the issued drilling instructions.
- Ensure that adequate edge protection is in place at all times.
- Carry out pre-start checks in accordance with the manufacturer's recommendations.
- Complete daily inspection sheet.
- DO NOT operate drill if any safety critical defects are found.
- Check guarding is in position, serviceable and operational.
- Set up and operate drill rig in accordance with manufactures recommendations.
- Recheck set up angle and record on drill log.
- Report to the Explosive Supervisor should you be unable to drill any shot hole as indicated on the drill log, or within the allowable variation allowable in the shot firing rules.
- Ensure that all cavities, obstructions, clay bands, basalt, and other things, however small, which may affect the shot encountered during drilling are recorded on the drill log.
- The drill rig must be securely anchored down if drilling on steeply inclined ground.
- Do not leave the rig unattended during drilling operations. Lock and immobilise the rig when it is unattended.
- If there is not adequate lighting, then all operations will cease during poor visibility and darkness.
- Check the completed hole depth with a tape measure.
- Cap the completed hole.
- Shut down drill rig in accordance with manufacturers' recommendations.

If at any time you are unable to properly discharge your responsibilities, you are required, without delay, to bring the matter to the notice of the senior manager in the Management Structure, responsible for this appointment.

Explosives Supervisor..... Signed.....Date.....

I confirm that I understand my duties under this appointment.

Appointee..... Signed.....Date.....
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Lealt Shotfiring Rules

APPENDIX 7: Appointment of Mobile Explosives Manufacturing Unit Operator (Bulk Explosives Truck)

Name.....

You are hereby appointed as a Mobile Explosives Manufacturing Unit Operator at **Lealt** Quarry. The Operator has the overall responsibility to co-ordinate all activities on site including those involving the use of explosives. The Explosives Supervisor has overall, day-to-day, charge of work with explosives at a quarry. You shall always liaise with the Operator and Explosives Supervisor as a matter of course.

You are required to ensure to:

- Comply with The Quarries Regulations 1999, Part V Explosives.
- Comply with the Shot firing rules relating to the storage, handling & use of explosives
- The equipment is in a suitable and safe working order, is calibrated as per the manufacturers requirements and carries recommended fire prevention equipment.
- You may only load shot-holes under the direct personal supervision of the shotfirer.
- Explosive usage for each shot hole is recorded on the loading sheets provided by the Shotfirer.
- Density and temperature checks are in line with manufactures recommendations and recorded on the loading sheets.
- Explosives are handled and used in a manner that is without risk to the health and safety of personnel in the vicinity and bring anything which may adversely affect this to the Explosive Supervisors or Shotfirers' attention immediately.
- Explosives mixing trucks must be earthed during mixing and transfer operations.
- Where the explosives column has risen too high in the shot-hole surplus explosives are removed by the approved product removal tool carried on the truck or by means of compressed air or water from the truck or by.
- At the end of charging, the delivery pipe is cleaned to atmosphere.

The Explosives Regulations 2014, make it an offence for a "prohibited person" to:

- Acquire, keep, handle or have control any relevant explosive or any restricted substance.
- Being knowingly employed in a position where they handle or had control of relevant explosives or any restricted substance.
- Be involved in direct handling of relevant explosives (e.g. manufacture, transport, storage and use), are covered; also covered are those persons involved in indirect control (e.g. supervising or organizing movements of relevant explosives).

Prohibited persons include:

- Anyone ever convicted of any offence under the Explosive Substances Act 1883
- Any person who has been subject of a sentence that is excluded under the Rehabilitation of Offenders Act 1974
- Anyone ever convicted of any offence in the last 7 years and sentenced to a term of imprisonment exceeding thirty months
- Anyone convicted of any offence in the last 4 years and sentenced to a term of imprisonment exceeding six months
- Anyone convicted of any offence in the last 2 years and sentenced to a term of imprisonment of less than six months
- Has served a period of service detention in HM Armed Forces in the last 12 months

If at any time you are unable to properly discharge your responsibilities, you are required, without delay, to bring the matter to the notice of the senior manager in the Management Structure, responsible for this appointment.

Explosives Supervisor..... Signed.....Date.....

I confirm that I understand my duties under this appointment and that I am not a prohibited person as defined in the Explosives Regulations 2014 as set out above.

Appointee..... Signed.....Date.....
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Lealt Shotfiring Rules

APPENDIX 8: Appointment of Blast Sentry

Name

Under Regulation 25(2)(a) of the Quarries regulations, you are hereby appointed as a Blast Sentry at **Lealt** Quarry.

Sentry Duties

Sentries will be briefed on their specific role for each blast by the Quarry Manager. They will be given clear instructions, informing them of their duties and responsibilities and where they must position themselves for the blast.

- You must ensure that you are in position in sufficient time to clear your area of responsibility and bar all entry to the danger zone.
- You must ensure that you understand the method of communication.
- You must stop traffic movement as directed.
- You must be in contact with the shotfirer and Quarry Manager when asked to do so, report that you are in position and that your area of responsibility is secure, or not.
- Immediately report to the shotfirer, if at any stage the danger zone is breached, or there is some other matter affecting the safety of the blast. Call **STOP, STOP, STOP** at any time to postpone firing.
- **IMPORTANT** If someone is determined to pass, do not attempt to restrain them by any means other than gentle persuasion. This applies particularly to public footpaths or roads, where a courteous approach is always imperative.
- You must ensure that you fully understand the audible warning procedure, as follows.
- **Add site specific siren below**

| | |
|---------------|---|
| 5min warning | 1 x 30 sec blast on siren |
| 1 min warning | Continuous siren |
| Fire Blast | Siren ON until post blast inspection completed |
| All Clear | 3 x 10 sec blast on siren |

- Stay in position when the shot is fired and bar all entry to the danger zone until the 'all clear' signal is sounded, and you are relieved by the Quarry Manager by radio. If in doubt **stay in position** and contact the Quarry Manager
- In the event of a misfire, you must stay in position and bar all entry to the danger zone until instructed to do otherwise by the blast controller.

If at any time you are unable to properly discharge your responsibilities, you are required, without delay, to bring the matter to the notice of the senior manager in the Management Structure, responsible for this appointment.

Quarry Manager..... Signed.....Date.....

I confirm that I understand my duties under this appointment.

Appointee..... Signed.....Date.....
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Lealt Shotfiring Rules

APPENDIX 9: Appointment to Handle Explosives

Name

Under Regulation 25(2)(a) of the Quarries Regulations 1999, you are hereby appointed to handle explosives in order to assist the shotfirer in their duties at **Lealt** Quarry. The Operator has the overall responsibility to co-ordinate all activities on site including those involving the use of explosives. The Explosives Supervisor has overall, day-to-day, charge of work with explosives at a quarry. You shall always liaise with the Operator and Explosives Supervisor as a matter of course.

Duties specific to this quarry are:

Under the close personal supervision of a Shotfirer, you may:

- Manual handle explosives boxes.
- Other similar tasks as directed by the shotfirer

You may not:

- Handle explosives unless instructed to do so by the appointed Shotfirer
- Receive deliveries of explosives materials and/or accessories.
- Make up primers.
- Charge holes.
- Transport explosives in a vehicle.
- Supervise explosives or charge holes.

The Explosives Regulations 2014, make it an offence for a "prohibited person" to:

- Acquire, keep, handle or have control any relevant explosive or any restricted substance.
- Being knowingly employed in a position where they handle or had control of relevant explosives or any restricted substance.
- Be involved in direct handling of relevant explosives (e.g. manufacture, transport, storage and use), are covered; also covered are those persons involved in indirect control (e.g. supervising or organizing movements of relevant explosives).

Prohibited persons include:

- Anyone ever convicted of any offence under the Explosive Substances Act 1883
- Any person who has been subject of a sentence that is excluded under the Rehabilitation of Offenders Act 1974
- Anyone ever convicted of any offence in the last 7 years and sentenced to a term of imprisonment exceeding thirty months
- Anyone convicted of any offence in the last 4 years and sentenced to a term of imprisonment exceeding six months
- Anyone convicted of any offence in the last 2 years and sentenced to a term of imprisonment of less than six months
- Has served a period of service detention in HM Armed Forces in the last 12 months

If at any time you are unable to properly discharge your responsibilities, you are required, without delay, to bring the matter to the notice of the senior manager in the Management Structure, responsible for this appointment.

Explosives Supervisor..... Signed.....Date.....

I confirm that I understand my duties under this appointment and that I am not a prohibited person as defined in the Explosives Regulations 2014 as set out above.

Appointee..... Signed.....Date.....

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APPENDIX 10: Appointment to Transport Explosives

Lealt Shotfiring Rules

Name: _____

Under Regulation 25.2(a) of the Quarries Regulations 1999, you are hereby appointed to transport explosives in order to assist the Shotfirer in their duties at **Lealt** Quarry. The Explosives Supervisor has overall, day-to-day, charge of work with explosives at a quarry. You shall always liaise with the Operator and Explosives Supervisor as a matter of course

You must ensure that:

- Use only designated vehicles approved by the Quarry Manager.
- Ensure that any vehicle provided for use in relation to shotfiring operations is so marked as to be readily identifiable from a distance.
- Vehicle is suitable and able to carry the required load safely and securely and to cope with the road conditions in the quarry.
- Well maintained and in sound mechanical order with good brakes, tyres, etc.
- Where a trailer is used, it must be fitted with efficient brakes and coupled to the towing vehicle by a rigid tow bar and safety chain.
- The part of the vehicle where the explosives are to be carried should be kept clean and free of grit. (It may be necessary to use a wooden liner)
- They should be loaded in a safe manner so that they cannot fall out of the vehicle.
- Ensure that explosives and detonators are transported in their manufacturers' containers.
- Use only the approved route as determined by the Explosives Supervisor
- Never leave the load unattended.
- In the event of an accident or any emergency, follow the procedures in the Operator's rules.
- Deliver the explosives and detonators only to the appointed Shotfirer or Explosives Storekeeper.

The Explosives Regulations 2014, make it an offence for a "prohibited person" to:

- Acquire, keep, handle or have control any relevant explosive or any restricted substance.
- Being knowingly employed in a position where they handle or had control of relevant explosives or any restricted substance.
- Be involved in direct handling of relevant explosives (e.g. manufacture, transport, storage and use), are covered; also covered are those persons involved in indirect control (e.g. supervising or organizing movements of relevant explosives).

Prohibited persons include:

- Anyone ever convicted of any offence under the Explosive Substances Act 1883
- Any person who has been subject of a sentence that is excluded under the Rehabilitation of Offenders Act 1974
- Anyone ever convicted of any offence in the last 7 years and sentenced to a term of imprisonment exceeding thirty months
- Anyone convicted of any offence in the last 4 years and sentenced to a term of imprisonment exceeding six months
- Anyone convicted of any offence in the last 2 years and sentenced to a term of imprisonment of less than six months
- Has served a period of service detention in HM Armed Forces in the last 12 months

If at any time you are unable to properly discharge your responsibilities, you are required, without delay, to bring the matter to the notice of the senior manager in the Management Structure, responsible for this appointment.

Explosives Supervisor..... Signed.....Date.....

I confirm that I understand my duties under this appointment and that I am not a prohibited person as defined in the Explosives Regulations 2014 as set out above.

Appointee..... Signed.....Date.....
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| Construction Environmental Management Document | |
|---|---|
| Section Number | 12 |
| Section Title | Public Access, Construction Traffic & Navigational Management Plan |
| Issue | 2 |
| Issue Date | 15/12/2023 |
| Author | Rhona Taylor and Daisy Hodge |
| Approved | Fiona Henderson |

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| 1 | 30/03/2023 | Issue to planning authority |
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| 2 | 15/12/2023 | Issue to Marine Scotland |

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12 Public Access, Construction Traffic & Navigational Management Plan

12.1 Introduction

A Public Access and Construction Traffic impact assessment has been completed for the Staffin Community Harbour development, as detailed in Chapter 15: Traffic and Access, and Chapter 18: Population and Socioeconomics, of the EIA. In addition, a navigational impact assessment was undertaken, as detailed in the EIA Chapter 16: Navigation.

During the 12-month construction period, the following traffic will require access to the site:

- Staff transport, either cars or minibuses; and
- Construction equipment and materials, deliveries of machinery and supplies of cement.

Traffic movements during the construction period will predominantly take access from the existing Staffin Road connecting the slipway with the A855. Rock materials which will be used in the construction of the development will be sourced from the Lealt Borrow Pit, which is accessed from the south via the A855.

The existing Staffin Road is a single track road which has passing places along its length of the track towards Staffin Slipway. The road is accessed via the A855 through a priority junction. The A855 itself is a two-way single carriageway which is subject to the national speed limit in the vicinity of the junction with the unclassified road that leads to Staffin Slipway. The speed limit of the A855 reduces to 40mph through the settlement of Staffin to the south of the access junction.

Increased traffic movements will limit the available space for parking at the slipway, particularly to those individuals wanting to access walking trails along the coastline. Although there is no intention to restrict access to the walking trails around Staffin, the access to the slipway area may at times be restricted and alternative routes from the core walking path (SL25.1) onto the single-track access route will need to be utilised.

In addition, vehicle movements give rise to a range of effects including driver and pedestrian delay, increased accident risk, track out and dust, etc.

As there is a need for harbour activities to continue throughout the construction period, there is also a requirement to have appropriate navigational controls in place to ensure safe navigation and appropriate access to the slipway.

As such, this section of the CEMD outlines the Public Access, Construction Traffic Management & Navigation Plans for the Staffin Community Harbour development.

12.1.1 Public Access

Under Condition 14 of Planning Consent 21/04525/FUL, associated with the Lealt Borrow Pit, details of how continued access to the coastal cliffs and to the north west corner of the site boundary must be outlined. In addition, Condition 15 of Planning Consent 21/04521/FUL relating to the harbour works, details that responsible access rights must be able to continue



along Core Path SL25.1 and along the shoreline southeast of the existing slipway. The Core Path is requested to remain unaffected and unobstructed by the works.

The Public Access Management Plan and associated mitigation measures to ensure public access to the walking trails around Staffin, are outlined in 12.3.

12.1.2 Construction Traffic

Under Condition 16 of Planning Consent 21/04521/FUL, the Construction Traffic Management Plan (CTMP) must include the measures included within the mitigation outlined in Chapter 15 of the EIAR. These are included in 12.3.

12.2 Regulations and Guidance

Relevant regulation and guidance includes, but is not limited to:

- Land Reform (Scotland) Act 2016 (as amended) from 2003 Act (relating to Core Paths);
- Road Traffic Act 1988 as amended;
- Planning Advice Note (PAN) 75;
- National Transport Strategy (2020); and
- The Highway Code.

12.3 Mitigation

12.3.1 Public Access Scheme – Lealt Borrow Pit

The Principal Contractor must ensure access to the coastal cliffs along the north/northwestern edges of the site boundary is maintained at all times throughout the construction phase. The following mitigation measures will be in place to minimise the effects of access restrictions to local amenities:

- A Local Liaison Officer has been put in place throughout the construction works (contact details can be found in Section 3a: Personnel List);
- Appropriate notice will be given to the community, detailing when and where works will be taking place prior to commencement as required during the construction works. This will be communicated by newsletter, to residents in the immediate vicinity and posted on
 - <https://skveecomuseum.com/latest>
 - <https://www.facebook.com/staffincommunity>
- Signage of detours and alternative provisions will be displayed and as agreed by the Highland Council (Lealt Borrow Pit Fence and Signage Plan in Appendix 12A).



Measures will be taken to ensure public access to the recreational areas surrounding the Lealt Borrow Pit during all blasting and quarrying activities. The appropriate management procedures implemented are likely to include:

- Temporary clearance of the paths near the Lealt Borrow Pit;
- Progress updates and rock blasting dates and times will be uploaded to the following websites:
 - <https://skveecomuseum.com/latest>
 - <https://www.facebook.com/staffincommunity>

The contractor shall implement the following mitigation measures during the construction phase of the Lealt Borrow Pit operations to enhance the value of the experience:

- Implement a Site Dust Management Plan at the Lealt Borrow Pit, as discussed in Section 10 of the CEMD.

12.3.2 Core Paths - Staffin Community Harbour

To ensure that access to Core Path SL25.1 (see Figure 12.1) is maintained at all times, the Principal Contractor must ensure that the core path always remains unaffected and unobstructed. Mitigation to ensure access to the path remains unaffected will include the avoidance of:

- Placing any materials on the path;
- Allowing water, soil or any other substance to flow or spill onto the path;
- Erecting any fences across the path;
- Prohibiting signs or notices;
- The placement of construction plan on the path;
- Overhanging any vegetation along the path;
- Projections from construction works; and
- Parking vehicles or placing any other structures on the path.

Emergency vehicle access to the Core Path SL25.1, the shoreline to the southeast of the slipway, to the coastal cliffs, and to the northwest of the site boundary is required to be maintained at all times to ensure public safety.

No changes to the Core Path SL25.1 will occur.



Figure 12.1: Core Path SL25.01 to Staffin Slipway

12.3.3 Construction Traffic Management Plans

CTMPs have been developed to manage construction traffic during the construction phase of the SCH upgrades. The Lealt Quarry Borrow Pit CTMP is developed for traffic operating within the Lealt Quarry Site, while the Harbour CTMP relates to all construction traffic, including traffic which has left Lealt Quarry with material for the Harbour.

CTMPs for both the Lealt Quarry and the harbour works can be found in Appendix 12B.

12.3.3.1 Construction Traffic Communication Plan

Information regarding the construction vehicle movements is to be provided to the local media outlets to help assist the public. These will include:

- Local Newspapers;
- Community Councils; and
- Appropriate websites/social-media outlets.

The Local Liaison Officer is expected to identify the best local outlets for communicating changes in construction traffic movements.

12.3.4 Marine Safety and Navigational Management Plan

A Navigational Risk Assessment (NRA) has been conducted to identify any additional navigational risks, and associated risk mitigation measures, to ensure that risk is 'as low as reasonably practicable' (ALARP) during the construction phase. The NRA is provided as



Appendix 12C and has been used to inform the Marine Safety and Navigational Management Plan (MSNMP) and can be found in Appendix 12D. The MSNMP has been created in order to discharge Condition 3.2.6 of the Marine Licence.

12.3.5 Marine User Access

A local liaison officer will be put in place with published contact details made available for all skippers utilising the SCH. They will facilitate effective communication between the construction management team and harbour users. This will include agreeing and publishing scheduled access times on the use of the existing slipway while construction/dismantling works are being undertaken on the existing slipway. This will take into account of commercial user and construction works requirements, the publishing of timing will allow recreational users to also utilise the existing slipway when it is available.

To minimise disruption to marine users, were it can be safely accommodated by the construction programme, concrete works on the existing slipway will not be undertaken until the new slipway is available.

12.4 Complaints and Issues

The Local Liaison Officer will be the point of contact for any complaints or issues arising. They will carry out appropriate investigations in the event of any complaints or issues being identified, to understand the route cause and resolution where practicable. The Local Liaison Officer will be responsible for communicating any complaints and issues with the Principal Contractor Site Manager.

12.5 References

The Highland Council, (2013). *Roads and Transport Guidelines for New Developments*. Retrieved from: https://www.highland.gov.uk/downloads/file/527/road_guidelines_for_new_developments.

The Highland Council, (2014). *Guidance on the Preparation of Transport Assessments*.



Appendix 12A – Lealt Borrow Pit Fence and Signage Plan

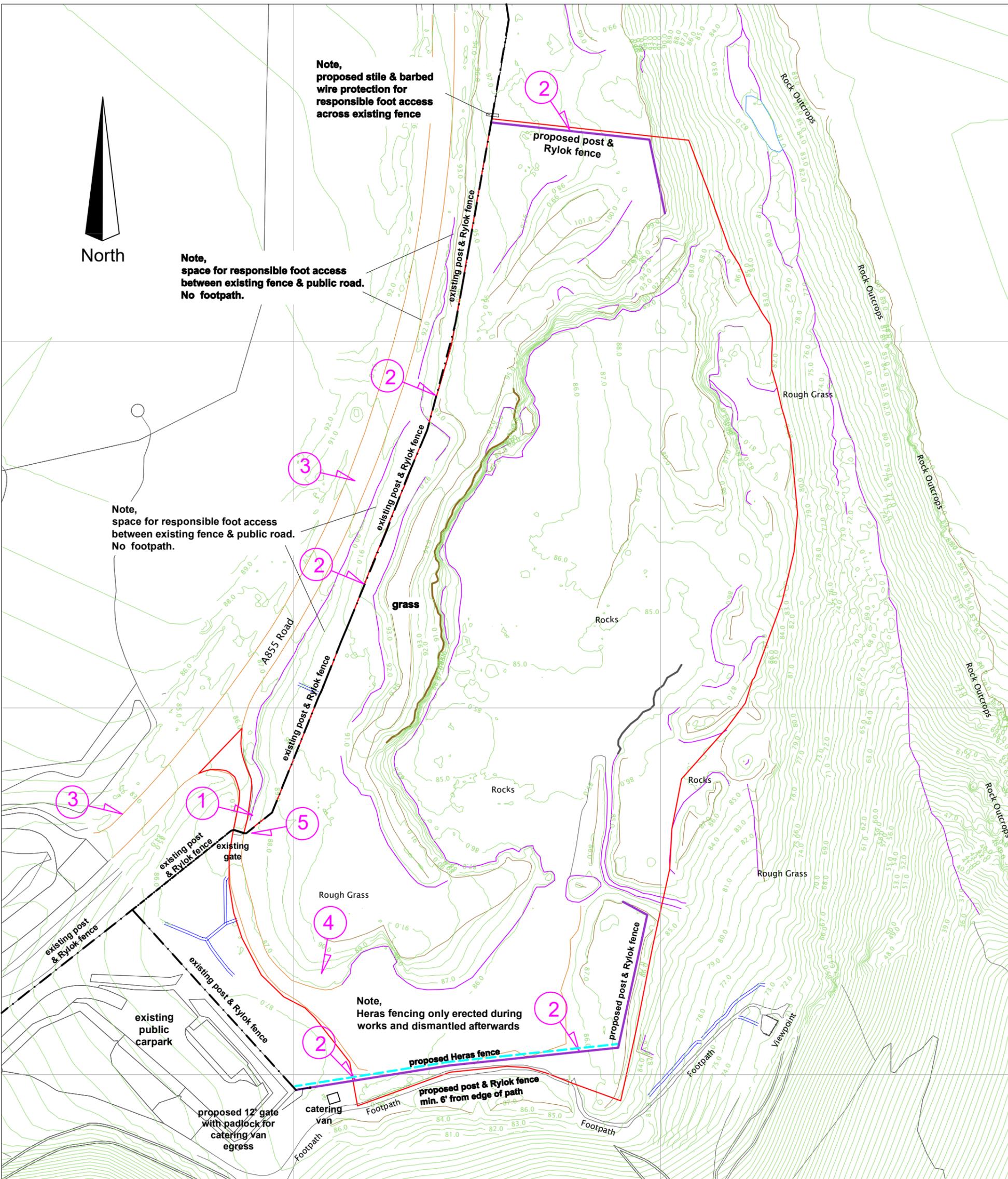


North

Note,
proposed stile & barbed
wire protection for
responsible foot access
across existing fence

Note,
space for responsible foot access
between existing fence & public road.
No footpath.

Note,
space for responsible foot access
between existing fence & public road.
No footpath.



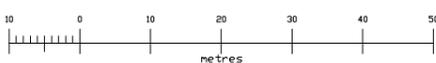
Key;

- existing 1 metre high post & Rylok fence with single strand barbed wire.
- proposed 1 metre high post & Rylok fence with single strand barbed wire.
- proposed Heras fence for duration of works only
- planning development area
- proposed signage & reference No. relating to attached photos & details of proposed signs

Lealt Borrow Pit Fence & Signage Plan

1:1000

Refer to planning consent ref 21/04525/FUL and approved Dalgleish plans ref 73.02 and associated EIA, for full details of rock extraction, restoration etc



Rev:03 amendments;
add sign No. 5 at entrance

Rev:02 amendments;
add 12' gate and move south rylok fence min 6' from edge of footpath

| | | | |
|--------|------------------|----------|----------|
| Rev:03 | Date: 20.10.2023 | Drawn JG | |
| Rev:02 | Date: 6.9.2023 | Drawn JG | |
| Rev:01 | Date: 4.8.2023 | Drawn JG | Chk'd ## |

Drg. No. JG5335

AREA 1



AREA 2



AREA 3



AREA 4

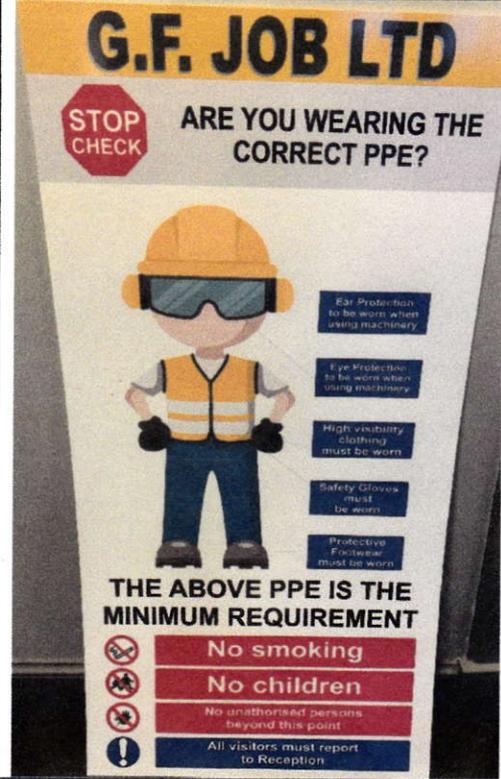


Danger cliff edge, stay away signs – 400 x 300

Site safety rules – 600 x 1200

All other signs – 600 x 450

AREA 5

| | |
|--|---|
|  | <p>contractors quarry entrance sign</p> <p>1000mm x 800mm</p> |
|  <p>Staffin Community Trust Harbour Development Project Lealt Borrow Pit</p> <p>For further information please refer to planning application ref 21/04525/FUL on The Highland Council planning website; https://wam.highland.gov.uk/wam</p> <p>For progress updates and rock blasting dates & times please refer to; https://skyeecomuseum.com/latest https://www.facebook.com/staffincommunity</p> | <p>Staffin Community Trust quarry entrance sign</p> <p>1000mm x 800mm</p> |



Appendix 12B – Construction Traffic Management Plans:

- **Lealt Quarry Traffic Management Plan**
- **Harbour Construction Traffic Management Plan**

Lealt Quarry Traffic Management Plan

Rev 01 20/10/2023

as per condition 12 of Planning Consent Ref 21/04525/FUL (Borrow Pit on site of former 'Lealt Quarry' to extract rock for Staffin Harbour project)

Main Contractor GF Job Ltd, contact Adrian Johnstone 07799 133 936

1. For the movement of heavy and abnormal loads for the delivery of quarry plant, an escort vehicle will be provided from the southern side of Portree to the site to assist with the safe passage on the narrow, local roads.
2. For the safe movement of some large vehicles into and out of the site, a banksman will be provided at the site entrance point.
3. A banksman/gateman will also be provided to ensure the safe access for tipper vehicles required to deliver quarry materials to the Staffin harbour site.
4. Temporary steel framed roadside signs with ballast will be located on road verges in the vicinity of the quarry entrance as follows and in accordance with signage plan JG5335 rev03; 'CAUTION LORRIES TURNING' & 'CAUTION SITE ENTRANCE' (see Appendix 12A Lealt Borrow Pit Fence and Signage Plan, and associated signage images).
5. A dry rumble strip inside the quarry entrance will ensure deleterious materials are not brought onto the public road.
6. Traffic movement inside the quarry will follow a one-way system as per attached plan.
7. Note, this stage of the project concentrates on work within the quarry and any movement of material from the quarry to the harbour will be subject to a separate traffic management plan as per condition 16 of 21/04521/FUL (Proposed improvements at Staffin Harbour).

Staffin Harbour Improvement Construction Traffic Management Plan

Rev 01 27/11/2023

as per condition 16 of Planning Consent Ref 21/04521/FUL (Proposed improvements at Staffin Harbour; erection of WCs, office, storage sheds, parking spaces, installation of septic tank, diesel fuel tanks and upgrading of existing private water supply)

Main Contractor GF Job Ltd, contact Adrian Johnstone 07799 133 936

1. The Road Traffic Act 1988 as amended, and the Highway Code will be adhered to when travelling on public and site roads. Road journeys will be minimised wherever practicable. Emergency vehicle access to Staffin Community Harbour and the Lealt borrow pit shall be maintained at all times and delivery drivers will be made aware of routes to be utilised to access the site and any particular hazards or sensitivities on their route and any restrictions on travel time.
2. The end of public road turning area as shown on Site Plan JG4846 rev02 (shown below) shall be kept clear at all times.
3. Normal site working hours will be between 0800 and 1900 (Monday to Friday) and 0800 and 1300 (Saturday).
4. All Drivers and site personnel are required to attend an induction to advise on road safety issues & sensitivities relevant to the site and access road network. HGV drivers will be required to sign up to a site-specific safe driving code of conduct rule document.
5. Video survey of the 1.6km single track public road from A855 to harbour (referred to as 'the harbour road') to be carried out and submitted to THC prior to any HGVs using the road. After every 5000 ton of materials transported on the single-track road, a detailed inspection to be carried out and any repairs undertaken by a suitably certified (SWQR) & permitted (Section 56) contractor.
6. For the movement of abnormal loads, an escort vehicle will be provided from the southern side of Portree to the site to assist with the safe passage on the narrow local roads. For the safe movement of same large vehicles into and out of the harbour road a banksman will be provided. *Note this is for abnormal loads only i.e. very large excavators on low loaders, not every tipper truck.*
7. Temporary steel framed roadside signs with ballast will be located on road verges in the vicinity of the junction between A855 & the harbour road as follows 'CAUTION LORRIES TURNING' & 'CAUTION SITE ENTRANCE'
8. During increased HGV movements in and out of the junction between A855 & the harbour road, a temporary speed limit of 30mph to be set using steel framed roadside signs with ballast on the A855 either side of the junction.
9. An HGV movement marshal shall be employed where required due to increased combined vehicle movements. The marshal shall plan movements & coordinate between quarry & harbour site to minimise chance of HGVs crossing on the harbour road. The marshal shall provide guidance to and ensure safety of general public road users, including signage to deter large camper vans from using the harbour road during times of HGV movements. The

marshal shall liaise with Staffin Community Trust to inform their wider community liaison via social media, newspapers, websites and signage.

10. All lorries carrying crushed aggregates shall be sheeted to reduce dust and stop spillage on public roads. Tractor & brush will be made available during HGV movements to maintain road clearing. Tractor to also provide water spray to control dust in dry conditions.
11. When site worker numbers exceed 12 personnel on site a minibus and remote parking area to be utilised to minimise additional traffic on the harbour road. When personnel numbers are less than 12, personnel to be encouraged to share vehicles.

Parking provision as per table 6.3 of 6.4.2 of Councils 'ROADS AND TRANSPORT GUIDELINES FOR NEW DEVELOPMENTS'

2 spaces / pontoon berth + 1 space / 2 staff
 = 15 pontoon berths x 2 = 30 spaces
 = 1 staff = 1

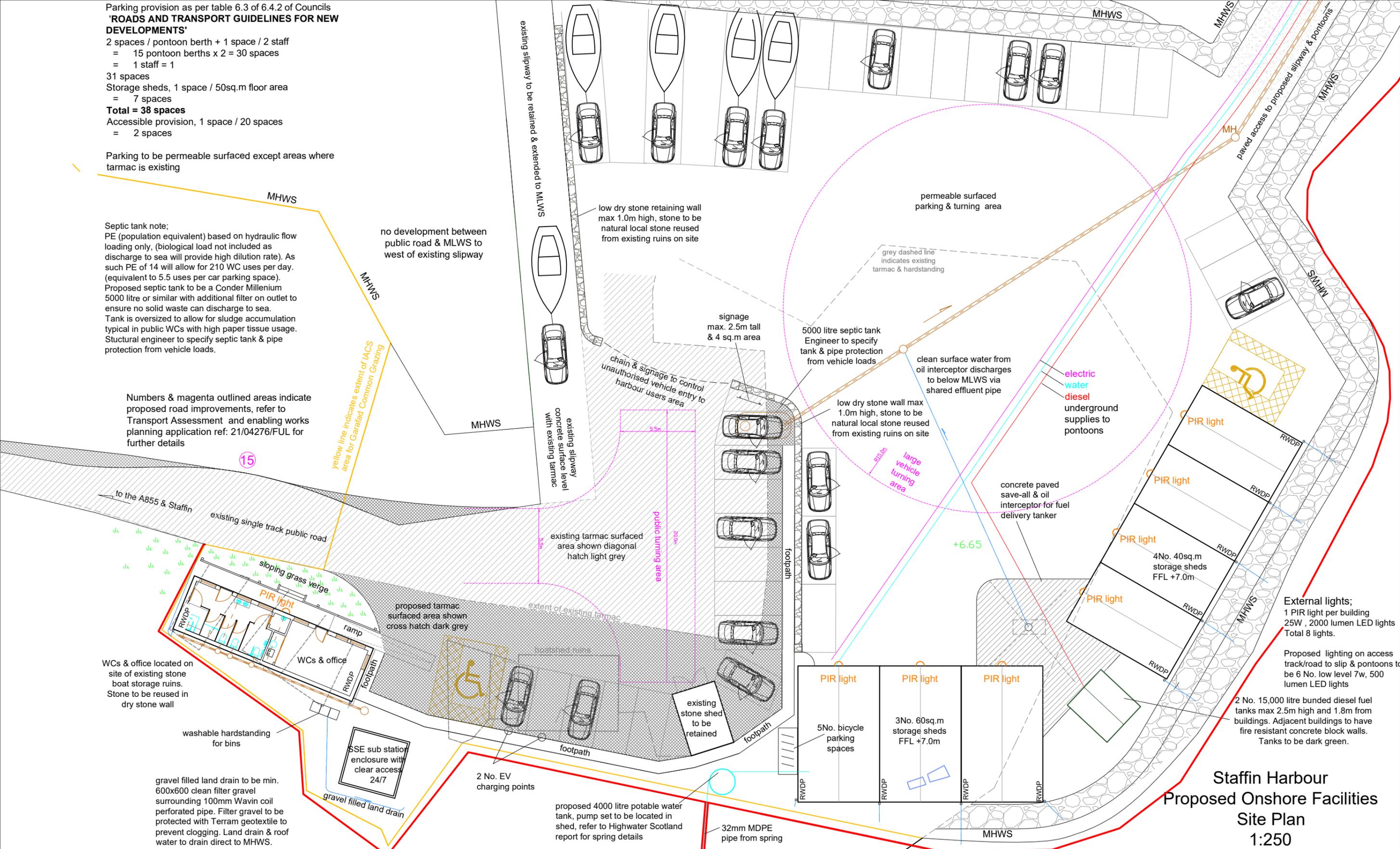
31 spaces
 Storage sheds, 1 space / 50sq.m floor area
 = 7 spaces
Total = 38 spaces
 Accessible provision, 1 space / 20 spaces
 = 2 spaces

Parking to be permeable surfaced except areas where tarmac is existing

Septic tank note:
 PE (population equivalent) based on hydraulic flow loading only, (biological load not included as discharge to sea will provide high dilution rate). As such PE of 14 will allow for 210 WC uses per day. (equivalent to 5.5 uses per car parking space). Proposed septic tank to be a Conder Millenium 5000 litre or similar with additional filter on outlet to ensure no solid waste can discharge to sea. Tank is oversized to allow for sludge accumulation typical in public WCs with high paper tissue usage. Structural engineer to specify septic tank & pipe protection from vehicle loads.

Numbers & magenta outlined areas indicate proposed road improvements, refer to Transport Assessment and enabling works planning application ref: 21/04276/FUL for further details

no development between public road & MLWS to west of existing slipway



WCs & office located on site of existing stone boat storage ruins. Stone to be reused in dry stone wall

gravel filled land drain to be min. 600x600 clean filter gravel surrounding 100mm Wavin coil perforated pipe. Filter gravel to be protected with Terram geotextile to prevent clogging. Land drain & roof water to drain direct to MHWS.

2 No. EV charging points

proposed 4000 litre potable water tank, pump set to be located in shed, refer to Highwater Scotland report for spring details

32mm MDPE pipe from spring

+6.65

External lights; 1 PIR light per building 25W, 2000 lumen LED lights Total 8 lights.

Proposed lighting on access track/road to slip & pontoons to be 6 No. low level 7w, 500 lumen LED lights

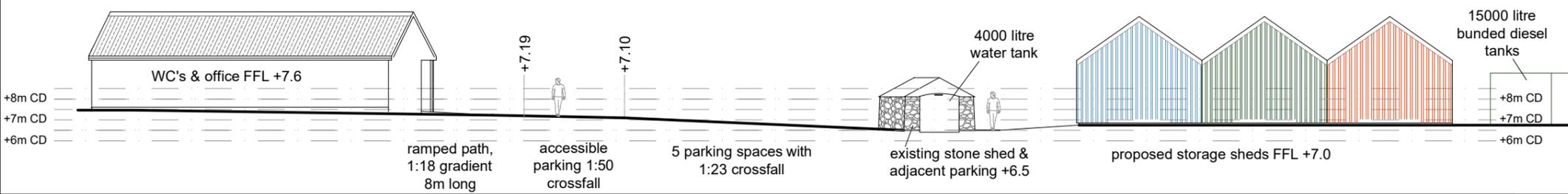
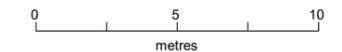
2 No. 15,000 litre bundled diesel fuel tanks max 2.5m high and 1.8m from buildings. Adjacent buildings to have fire resistant concrete block walls. Tanks to be dark green.

Staffin Harbour Proposed Onshore Facilities Site Plan 1:250

Red line indicates extent of terrestrial planning development area = 12895 sq.m, 1.29 ha

Refer to General Arrangement Plan for full extent of proposal
 Refer to Wallace Stone Plans for all breakwater, pontoons, slipway details
 All heights in metres relative to Chart Datum
 MHWS +5.3, MLWS +0.7

Rev:02 show new tarmac & alter hammerhead orientation



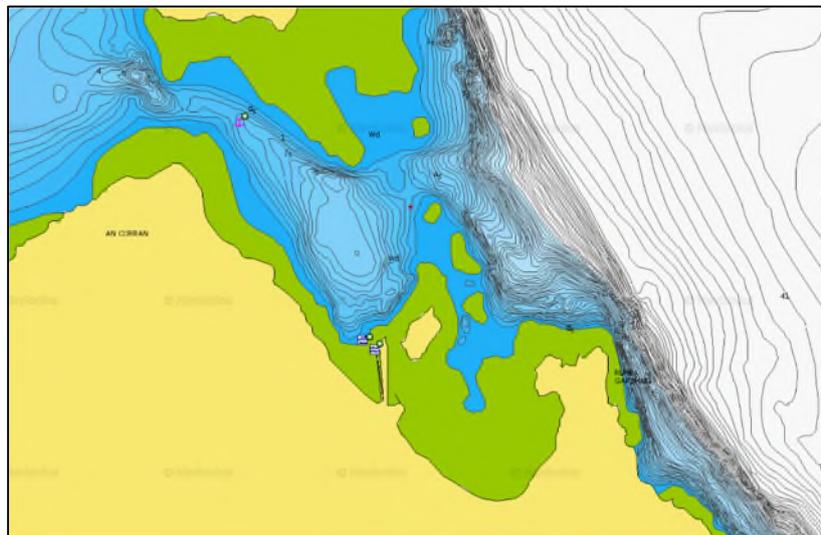
| | | | |
|-----------------|------------------|----------|----------|
| Rev:02 | Date: 18.11.2021 | | |
| Rev:01 | Date: 17.9.2021 | Drawn JG | Chk'd MH |
| Drg. No. JG4846 | | | |



Appendix 12C – Navigational Risk Assessment



Proposed Staffin Harbour Development Navigational Risk Assessment



23 11 2023

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| 4 | Summary |
| Appendix 1 | NRA Content and Results |
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Abbreviations

| | |
|-------|-------------------------------------|
| ALARP | As Low As Reasonably Practicable |
| AtoN | Aid(s) to Navigation |
| CD | Chart Datum |
| DP | Designated Person |
| DMC | Drennan Marine Consultancy Ltd |
| FRA | Formal Risk Assessment |
| GA | General Arrangement |
| HEO | Harbour Empowerment Order |
| IMO | International Maritime Organisation |
| MCA | Maritime & Coastguard Agency |
| MHWS | Mean High Water Springs |
| MHWN | Mean High Water Neaps |
| MLWN | Mean Low Water Neaps |

| | |
|------|------------------------------------|
| MLWS | Mean Low Water Springs |
| NLB | Northern Lighthouse Board |
| NRA | Navigational Risk Assessment |
| NtoM | Notice(s) to Mariners |
| PMSC | Port Marine Safety Code |
| RAMS | Risk Assessment / Method Statement |
| RCO | Risk Control Option |
| SCT | Staffin Community Trust |
| SHA | Statutory Harbour Authority |
| SUP | Stand-Up Paddleboard |
| UXO | Unexploded Ordnance |

References

| | |
|---|---|
| 1 | Marine Scotland License MS-00009582 (6 th Oct 2022) |
| 2 | IMO Maritime Safety Committee Circular MS/Circ.1023 MEPC/Circ.392: 5-4 2002 (GUIDELINES FOR FORMAL SAFETY ASSESSMENT (FSA) FOR USE IN THE IMO RULE-MAKING PROCESS) |
| 3 | IMO Maritime Safety Committee MSC/Circ.1180 MEPC/circ.474: 25-8-2005 (REVISED GUIDELINES FOR FORMAL SAFETY ASSESSMENT (FSA) FOR USE IN THE IMO RULE-MAKING PROCESS) |
| 4 | The Port Marine Safety Code and Guide to Good Practice |

Section 1 Introduction

Context

- 1.1 The community of Staffin on the north-east facing coast of Skye has a local Community Trust (Staffin Community Trust, or STC) which has plans to improve the local area in beneficial and sustainable ways for residents and businesses in the area. One such proposed improvement is the local “harbour” which currently comprises just a natural bay with a single slipway and some limited shore facilities.
- 1.2 To this end, STC has identified the current and future needs of the commercial and leisure users of the harbour and has, with the support of experienced planning and environmental consultants Affric Ltd and Marine and Civil Engineers Wallace Stone, developed plans and have obtained an initial License¹ to progress these plans from the relevant Scottish Government regulator, Marine Scotland.
- 1.3 To move beyond the initial consents stage, the Marine License has a number of conditions which must be discharged to the satisfaction of Marine Scotland and some of their statutory consultees such as the Maritime and Coastguard Agency (MCA) and the Northern Lighthouse Board (NLB). One such condition related to the safety of navigation at Staffin harbour during the construction of the new harbour facilities (Reference 1 section 3.2.6). This document is the Navigational Risk Assessment (NRA) referred to in the License.

Drennan Marine Consultancy Ltd

- 1.4 Drennan Marine Consultancy Ltd (DMC) is a ports and harbours consultancy which regularly undertakes NRA studies, most commonly for new port projects in the international oil and gas sector. Previous experiences in the local area include:
 - A NRA for a timber harvesting project at Kilfinichen on Mull
 - Expert Witness for a Public Enquiry for a proposed new ferry Terminal on Raasay
 - A Marine Risk Assessment at Uig Harbour
 - A NRA to compare risks of tanker traffic via The Minches versus use of the West of Hebrides Deep Water Route.
- 1.5 Captain Tom Drennan:
 - Holds a UK Class 1 Master Mariner Certificate of Competency
 - Was previously employed as a Senior Marine Officer with the Port of London Authority
 - Holds a Nautical Institute Harbour Master’s Certificate
 - Is a Fellow of the Royal Institute of Navigation ***“In recognition of his contribution to safety in port areas through the development of port risk assessment and navigational safety management systems.”***

- Is the Designated Person (DP) for a UK port for the purposes of that port's compliance with the Port Marine Safety Code (PMSC)
- Was formerly a Board member of his local Trust Port (Littlehampton Harbour), appointed by West Sussex County Council.

Overview of this Report

- 1.6 Section 2 characterises the existing facilities at Staffin and how they are used by the local stakeholders. Additionally, the proposed harbour infrastructure and how that will better serve the needs of stakeholders is described.
- 1.7 Section 3 sets out the terminology and methodology for this NRA and also lists the hazards considered to be introduced during the construction phase of the harbour improvements. Note: this is a “desktop” NRA based on the author's experience and understanding of the Staffin project. It has not been possible to undertake face-to-face stakeholder consultation.

The core results of the NRA process are contained in Appendix 1.

- 1.8 Section 4 summarises the NRA outcomes and actions for mitigating the risks, as identified. Appendix 2 lists the indicative contents of a Risk Assessment and Method Statement (RAMS) which may be expected from a contractor engaged in a marine civil engineering project such as proposed at Staffin.

Section 2 Staffin Harbour Overview

The Harbour - Now

- 2.1 The following series of images show that the harbour has very limited (and limiting) marine infrastructure – essentially just a naturally (reasonably sheltered) bay containing a single narrow slipway and adjacent breakwater; a single vehicular approach; and some basic utilities and shore storage facilities.



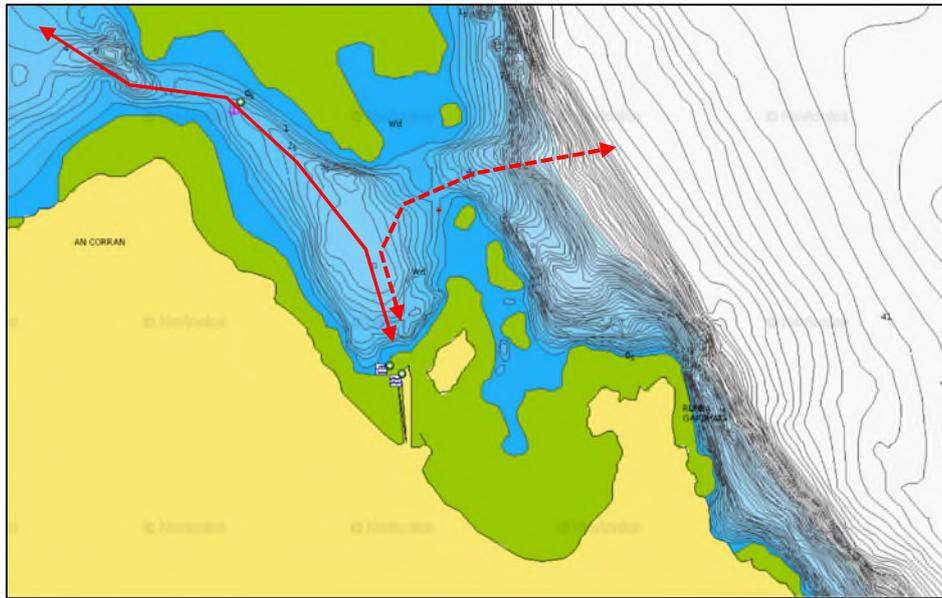


Image from Navionics with Unmarked Channel Shown in Red (Solid Line)

2.2 The users / stakeholders of the harbour and the harbour facilities are as listed below:

- Organic Sea Harvest (<https://organicseaharvest.co.uk/>) - operates two salmon farm sites to the south of Staffin and uses the harbour as a shore station for getting personnel and lightweight gear to and from that site.

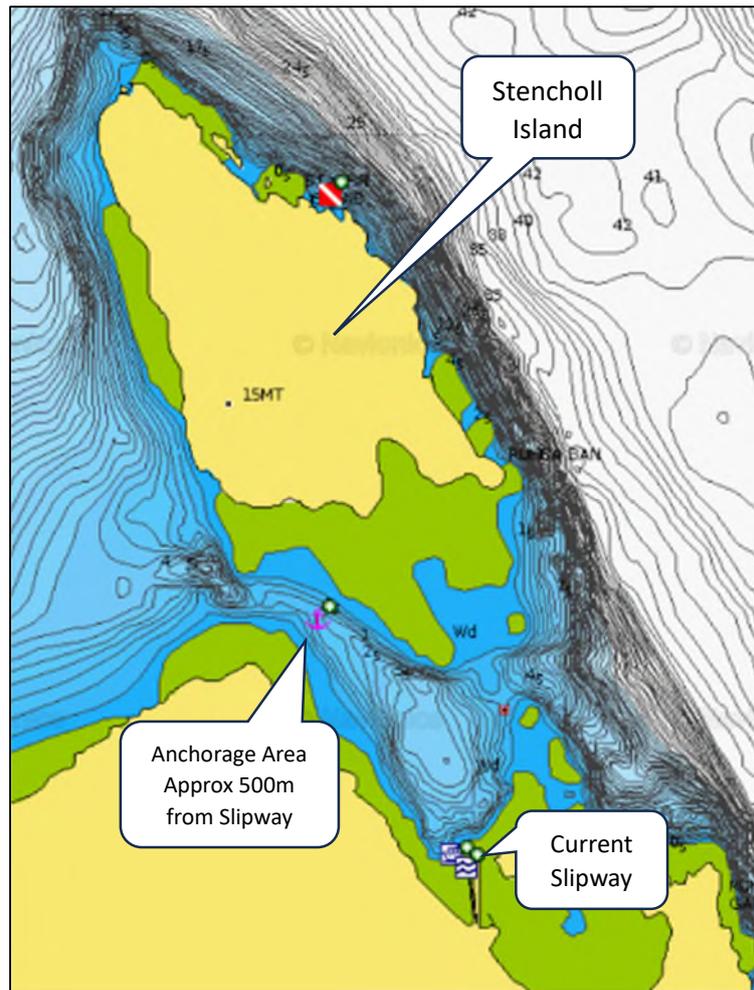
They have two or three crew boats of around 10m LOA which are moored in the lee of Stencholl (aka Staffin) Island. They launch a tender on the slipway using a telehandler. Movements tend to be in the morning and evening with an occasional one through the day.

- Commercial creel boats - currently one around 12m LOA, occasionally two or three (10m LOA and below). Same procedure as above with moorings and access via tenders. Movements tend to be morning and evening. Landing catches can be any time, depending on the timetable of the buyer's lorry.
- Tourist boat – Around 9m LOA carrying up to 10 passengers and 2 crew, operated this summer (2023) by Staffin Community Trust in partnership with the boat owner who may return for a couple of months in summer of 2024. Typically three tours each day between 10am and 5pm, depending on weather and tide at the slipway. Boat was kept on a summer mooring off the breakwater.
- Recreational fishing - typically one or two, occasionally as many as six or seven boats up to 7m LOA launched and recovered on the day.
- Boat haulage - SCT has bought a 25 tonne Roodberg boat lift trailer which has been used (so far) to haul and launch one 8m yacht and the tour boat, but the intention is to expand this to more and bigger boats when the new hardstanding at the harbour is

complete. When the main civil works (i.e. breakwater) are underway this activity will be restricted to a handful of smaller (e.g. 8m) boats that can be trailered up the road for storage.

- Visiting yachts - It is currently quite rare to see a visiting yacht (sail or motor) in the harbour, but they occasionally anchor in the bay off Stencholl. However, Staffin's location has been highlighted by the leisure marine industry as a critical 'stepping stone' for small boats transiting from mainland to Western Isles. Those boats are typically limited by daylight hours and suitable weather conditions. An improved Staffin Harbour would offer a safe all-weather refuge with fuel, water, supplies, etc for transiting/visiting boats.
- Kayaks; Stand-Up Paddleboards (SUPs); and Jet Skis – although it is considered that there are unlikely to be any local clubs hosting regular events in the area, the fact that these craft are easy to transport and easy to launch (often from beach locations) means that their potential presence cannot be excluded. Similarly, swimmers may be present.
- Facilities and Constraints - The harbour and its approach do not have any Aids to Navigation (AtoNs). There are no bunkering facilities. The slipway is tidal - inaccessible at MLWS to anything bigger than a dinghy. The "official" (currently unmarked) channel in and out is indicated in red solid line in the above Navionics image. There is a secondary "channel" in the reef to the east that is typically used only by locals (marked in the above Navionics image by the red dotted line).

2.3 It can be seen from the above that the main constraint of the harbour is it's single and very tidally restricted slipway. This can only be used at certain states of the tide by very small tenders which boat operators use to ferry themselves out to and back from craft anchored in deeper water in the lee of Stencholl Island.



Proposed Harbour Improvements

2.3 The General Arrangement (GA) below shows the proposed harbour improvements which are intended to make the harbour safer; easier to use; and more attractive to businesses and visitors. The key marine elements of the proposal are described below.

- A new breakwater extending from the shoreline (current vehicle turning area) northwards by about 240m and then curving to the west to form a sheltered basin area in deeper water. Within this new basin there would be:
- A new wider slipway with a steeper gradient in deeper water which would offer access over a greater tidal window. The seaward end of the slipway will be capable of accommodating a landing craft (20m x 8m) for loading / discharging gear.
- An array of pontoons accessible from the breakwater via a hinged brow. The objective here is to allow candidate craft to remain afloat throughout the tidal cycle and therefore enable working whenever weather and operational requirements allow.
- On the breakwater and on the shore, there are improved utilities; storage; sanitation; parking; lighting; and waste reception facilities, all with appropriate signage.
- Navigation to and from open waters will be supported by installation of three pairs of unlit channel buoys (IALA System A) in positions which have been provisionally agreed with the Northern Lighthouse Board (NLB). A port hand pole (with topmark) will mark the end of the new breakwater, and a starboard hand pole (with topmark) will mark the end of the existing slipway to highlight the entrance to the newly created basin for craft entering from the west (all subject to NLB approval).

Notes on Breakwater:

1. The construction of the new “hockey stick” breakwater is unlikely to add any additional ***navigational*** risk for craft entering from and leaving to the west, as all construction is to the east of the only boarding and landing point ie the existing slipway. However, craft entering from and leaving to the east will be impacted by the construction and this is addressed in the NRA.
2. Although it cannot be considered to be a “navigational” risk, SCT and its lead engineering and environmental consultants (see section 1.2) are aware that during construction “wash out” of fine material from the core of the breakwater may occur due to heavy weather. This will not be a problem once the top rock protection is in place.

Governance and Staffin Community Trust

- 2.4 In an existing port or harbour, there is usually a port authority upon whom legal powers and responsibilities are conferred, and which must discharge those responsibilities in accordance with international and UK maritime and environmental legislation. That port authority could be structured and empowered as:
- a Trust Port
 - a Municipal Port
 - a Private / Public Equity Port

Although the Staffin Harbour project sponsor and Licensee named in Reference 1 is Staffin Community Trust (SCT), SCT is not currently a Statutory Harbour Authority (SHA) and it is understood that it will not become one. (To do so, it would be necessary for the Government to issue a Harbour Empowerment Order – HEO).

- 2.5 Highland Council is the SHA for the major mainland and island harbours in its region. Inasmuch as they are involved at Staffin, the following is noted (my added emphasis):

“The Highland Council Harbours Authority is responsible for the harbours of:

Gairloch; Helmsdale; Kinlochberrie; Kyle of Lochalsh; Lochinver; Portree; Uig; Eigg; Muck; Rum

We also manage many other small piers, harbours and jetties throughout the Highlands. Most of the harbours are involved in the fishing industry, ferry operations and general cargo.

This information is just a general guide. Mariners should always contact the relevant Harbour Master to confirm and establish berth availability and suitability”.

Source:

https://www.highland.gov.uk/info/1523/transport_and_streets/102/harbours.

- 2.6 It is also understood that Highland Council owns the existing breakwater within the harbour and that, prior to STC being granted consent to progress with the construction of licensed improvements, ownership of the breakwater will pass from Highland Council to SCT.
- 2.7 With Highland Council divesting itself of ownership of the breakwater – and presumably any responsibility and authority for marine governance in Staffin Bay (which was already minimal anyway) – the question arises as to who has responsibility for marine governance at the improved Staffin Harbour.
- 2.8 It is assumed that SCT, or an operating company/organisation of some sort formed by STC, will be the entity which is the defacto “port authority”. It is important to note this assumption because much of what follows in this NRA, and also in relation to the subsequent Marine Safety Management Plan (MSMP), refers to an entity which “owns” the governance and safety management responsibility.

Section 3 NRA Process – Terminology and Methodology

Introduction

- 3.1 This section explains the how a Formal Risk Assessment (FRA) is undertaken and references the international standards or undertaking risk assessments in the maritime/shipping industry.

Description of FRA Process

- 3.2 All marine operations - like all of life - has some risk. The problem is that the same activity can often mean different levels of “*risk*” to different people. For example, crossing a busy road is higher risk to a small child than to an adult but the **hazard** is exactly the same – the **hazard** of being struck by a car. Such subjectivity is not helpful, so the Formal Risk Assessment (FRA) process is a means of ensuring that the rather subjective opinions of “*risk*” are established in a more consistent, professional, and analytical way.
- 3.3 In comparison with other sectors of industry such as the nuclear industry and the offshore oil and gas industry, the international ports sector has been slow to embrace the concept and value of Formal Risk Assessment (FRA). The extent to which port regulatory bodies around the world (eg port authorities or government departments) embrace FRA, and the methodologies which they use, will vary. However, most port authorities will recognise FRA guidance published by the International Maritime Organisation (IMO) in:
- MS/Circ.1023 MEPC/Circ.392: 5-4 2002²;
 - MSC/Circ.1180 MEPC/circ.474: 25-8-2005³.
- 3.4 In the UK, the serious grounding of the tanker “Sea Empress” in 1993 resulted in a fundamental change in the way that UK harbours manage their marine safety issues. The outcome was the development and introduction by the UK Department for Transport (DfT) of the Port Marine Safety Code (PMSC) and the associated publication known as the Guide to Good Practice (GtGP) <https://www.gov.uk/government/publications/port-marine-safety-code>⁴
- 3.5 The methodology used in this risk assessment mirrors the guidance in the PMSC which itself is based on guidance published by IMO given in section 3.3 above.

Applicability at Staffin and Terminology

- 3.6 A full FRA has five key stages, viz:
- Stage 1 - Data Gathering and Familiarisation
 - Stage 2 - Hazard Identification
 - Stage 3 - Risk Analysis
 - Stage 4 - Risk Assessment
 - Stage 5 - Risk Control
- NB - This NRA follows the FRA steps in an abbreviated / proportionate way which reflects the low level of marine activity at Staffin.

The stages are described in more detail below but, firstly, some definitions and terminology are given below:

- A **Hazard** is something that has the potential to cause harm to either people, property, the environment, or to the business reputation (***what can happen?***)
- **Frequency or Probability** is the likelihood of that hazard occurring (***how often could it happen?***)
- **Consequence** is the effect which the hazard would have, if the hazard was to occur (***what would be the result if it did happen?***)
- **Risk** is the combined effect of Frequency and Consequence
- **Risk Control Option (RCO)** is something which is done to reduce the frequency of a hazard occurring, or to reduce the consequences / effects of that hazard if it was to occur. These are also called **mitigations** (***what can we do to make it better?***)
- **Risk Category** is a definition of relative risk. A hazard which was very likely to occur and had severe consequences would be a hazard which is categorised as Extreme or High Risk. A hazard which was unlikely to occur and had minor consequences would be a hazard which is categorise as Low Risk
- **ALARP means As Low As Reasonably Practicable.** Between the limits of Extreme or High Risk and Low Risk, there is a range of risks which may be considered as acceptable because they are (or can be made) ALARP.

Stage 1 - Data Gathering and Familiarisation

3.7 In preparation for the risk assessment, DMC has carried out limited familiarisation with the site and the proposed development, the existing vessels and their operational requirements and - to the extent that it has been possible to do so - some appreciation of the construction processes which will be used.

This has included:

- A review of public forum data including navigational chart UKHO 5616-9 (Rona to Shiant Islands)
- Review some of the other studies carried out in support of the Staffin proposed development with particular reference to the relevant parts of the draft Affric Environmental Impact Assessment (EIS) and Construction Environmental Management Document (CEMD)
- Web searches and reviews of industry / media material to gain a sense of marine activities in the Staffin area.

No site visit or Hazard Identification (Hazid) workshop / consultation involving local stakeholders has been undertaken.

Stage 2 - Hazard Identification

- 3.8 This phase builds on the work of Stage 1 and identifies hazards expected to be encountered during construction of the harbour improvements because of the nature and/or area of the work.

It is important to note that, once a contractor is appointed, that contractor will develop and publish their own Risk Assessment / Method Statement (RAMS) which will be very detailed and will reflect the plant, personnel, schedule, and working practices of the contractor.

Those RAMS are, rightly, mainly for the purpose of ensuring a safe working environment for the contractor's own workers, but the safety of harbour users and the public will also be considered in the RAMS. Please see Appendix 2 for *indicative* contents of a contractor's RAMS.

- 3.9 The identification of hazards for this study was carried out by the DMC team of professionals drawing on information obtained at Stage 1, including the concerns previously expressed by consultees. The hazards identified, and taken forward to the risk assessment stage are:

| Hazard No. | Hazard Description |
|---|--|
| <i>Construction Activity at Existing Breakwater</i> | |
| 1 | Construction plant obstructing slipway |
| 2 | Collapse of construction plant at or near slipway |
| 3 | Dropped objects during dismantling of existing breakwater |
| 4 | Cables and tripping hazards in slipway area |
| <i>Construction Activity at New Breakwater and Slipway</i> | |
| 5 | Breakwater - Planned underwater obstruction (grounding hazard) |
| 6 | Breakwater - Unplanned underwater obstruction (grounding hazard) |
| 7 | Slipway - Planned underwater obstruction (grounding hazard) |
| 8 | Slipway - Unplanned underwater obstruction (grounding hazard) |
| 9 | Cables and tripping hazards in vehicle turning / tender storage area |
| 10 | Collapse of construction plant at or near new breakwater or slipway |

Stage 3 – Risk Analysis

- 3.10 Stage 3 introduces the concept of risk in a qualitative way in order to prioritise the hazards identified during Stage 2 and assess their impact on safety. As explained above, risk is the combination of frequency and consequence. Prioritisation is an essential part of the process as, clearly, the greater the potential posed by a hazard, the greater the need to ensure that there are control measures, or defences, in place to mitigate that risk.

- 3.11 Sorting and ranking the HAZID output and adding the frequency component (i.e. how often such a hazard could happen – once a year, once every 10 years; 100 years 1000 years...)* generates the risk profile. The frequency or likelihood of incidents can be established using professional advice, judgement or experience and, where appropriate, historical data identified in the first stage of the work (or a combination of all of these).

*It is appreciated that the Staffin project is not intended to last for 1,000 years or even 100 years. The above frequencies are simply used as a means of differentiating between hazard frequencies in a relative way.

Normally, risks are assessed in four ways against a common frequency scale:

- Consequence to life
- Consequence to the environment;
- Consequence to port authority operations; and
- Consequence to port users' business activity or reputation.

Stage 4 – Risk Assessment

- 3.12 This process compares existing operations and procedures supported by relevant control measures with the new risk profile created by the introduction of the new trade or operation. It identifies gaps, which will require the introduction of new or enhanced risk control measures to reduce the level of risk to an acceptable level.

Stage 5 – Risk Control

- 3.13 This stage identifies the specific Risk Control Options (RCOs) or mitigations to be adopted to reduce the risks to ALARP or below.
- 3.14 The details available from, or produced by, the above five stages are brought together in the Risk Matrix. This is the means of:
- Placing initial (raw) values of frequency and consequence for each hazard,
 - Determining the initial (raw) risk value and identifying which hazards have the highest score
 - Consider what RCOs can and should be applied. The application of RCOs is essential for hazards which are initially categorised as Extreme or High Risk
 - Re-assessing these hazards after the application of RCOs.
- 3.15 The Risk Matrix, along with the definitions of Frequency, Consequence, and Risk are shown in the Figure at the end of this section.

Production of Risk Register

- 3.16 The whole NRA process has two equally important end products. The first end product is that the very **process** of following a structured and methodical approach has safety improvement benefits. The **process** finds risks and reduces or eliminates them in

advance of the operations commencing (rather than finding out the risks after an accident has occurred!)

3.17 The other end product is the record of what was agreed and committed to and a statement that the residual risk is accepted by all parties and is “owned” by the lead party, in this case Staffin Community Trust.

Risk Criteria and Matrix

3.18 The 5 x 5 matrix below shows:

- the five levels of Frequency F (of a hazard occurring) on the horizontal axis and
- the five levels of Consequence C (if the hazard were to occur) on the vertical axis.

NB – this matrix is most often used in ports where there is an extensive mix of shipping, hence the frequent reference to “vessels”. However, it is considered that the basic structure of the matrix and the defined risk tolerance criteria are applicable in any NRA.

| RISK ASSESSMENT MATRIX: RISK CRITERIA | | FREQUENCY | | | | |
|---------------------------------------|---|--|--|---|--------------------------------------|--|
| | | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| | | Rare One or more times greater than 100 | Unlikely One or more times 100 year | Possible One or more times in 10 years | Likely One or more times per year | Almost Certain Ten or more times per year |
| Consequence | 5 – Loss of vessel or severe damage to vessel / environment. Multiple fatalities International news coverage. | Moderate (5) | High (10) | Extreme (15) | Extreme (20) | Extreme (25) |
| | 4 – Major damage to vessel / environment. Single Fatality. National news coverage. | Minor (4) | Moderate (8) | High (12) | Extreme (16) | Extreme (20) |
| | 3 – Moderate damage to vessel / environment. Moderate / major injury Regional news coverage. | Minor (3) | Moderate (6) | Moderate (9) | High (12) | Extreme (15) |
| | 2 - Minor or superficial damage to vessel / environment. Minor injuries and local news coverage. | Slight (2) | Minor (4) | Moderate (6) | Moderate (8) | High (10) |
| | 1 - Insignificant or no damage to vessel / equipment / environment. No injuries. | Slight (1) | Slight (2) | Minor (3) | Minor (4) | Moderate (5) |
| ACTION KEY | Slight (1 – 2) | No Action is required | | | | |
| | Minor (3 – 4) | No additional controls are required, monitoring is required to ensure no changes in circumstances | | | | |
| | Moderate (5 – 9) | Efforts should be made to reduce risk to ‘As low as reasonably practicable’ (ALARP), but activity may be undertaken | | | | |
| | High (10 – 14) | Efforts should be made to reduce risk to ‘As low as reasonably practicable’ (ALARP). Activity can only be undertaken with further additional controls. | | | | |
| | Extreme (15 – 25) | Intolerable risk. Activity not authorised | | | | |

The resultant Risk R from F x C is accorded a risk category from Extreme (red) to Slight (dark green). Any hazard which is Moderate, Minor, or Slight can be regarded as ALARP (as Low As Reasonably Practicable).

These criteria and the matrix have been applied in the assessment shown in Appendix 1.

Section 4 - Summary

4.1 This NRA has been carried out using the format most normally applied for major port developments – which is, arguably, a bit of “overkill” given that:

- a) The marine activities at the harbour are minimal, and
- b) All the risks during the construction phase are to be defined and mitigated by the contractor through their detailed RAMS.

4.2 However, this NRA has concluded that there are some particular risks which SCT and the contractor must be made aware of. Some of these are true “navigation” risks (eg grounding on the submerged parts of the new breakwater or new slipway) but most are “industrial” risks (eg obstructions from and failures of construction equipment).

4.3 The detail of the assessment is in Appendix 1, but the summary is here:

| ASSESSMENT OF RISKS AT STAFFIN HARBOUR | | | | | | | |
|--|--|------------|---|----|------------------|---|---|
| Hazard No. | Hazard and Existing RCOs | Raw Scores | | | Mitigated Scores | | |
| | | P | C | R | P | C | R |
| 1 | Construction plant obstructing slipway | 2 | 1 | 2 | 2 | 1 | 2 |
| 2 | Collapse of construction plant at or near slipway | 2 | 5 | 10 | 1 | 5 | 5 |
| 3 | Dropped objects during dismantling of existing breakwater | 2 | 1 | 2 | 2 | 1 | 2 |
| 4 | Cables and tripping hazards in slipway area | 2 | 1 | 2 | 2 | 1 | 2 |
| 5 | Breakwater - Planned underwater obstruction (grounding hazard) | 4 | 3 | 12 | 2 | 3 | 6 |
| 6 | Breakwater - Unplanned underwater obstruction (grounding hazard) | 2 | 3 | 6 | 1 | 3 | 3 |
| 7 | Slipway - Planned underwater obstruction (grounding hazard) | 4 | 3 | 12 | 2 | 3 | 6 |
| 8 | Slipway - Unplanned underwater obstruction (grounding hazard) | 2 | 3 | 6 | 1 | 3 | 3 |
| 9 | Cables and tripping hazards in vehicle turning / tender storage area | 2 | 1 | 2 | 2 | 1 | 2 |
| 10 | Collapse of construction plant at or near new breakwater or slipway | 2 | 5 | 10 | 1 | 5 | 5 |

| AFTER MITIGATION | | | |
|-----------------------|-----------|-------------|-------|
| Risk Type | No. | % | |
| Extreme Risk Hazards | 0 | 0% | |
| High Risk Hazards | 0 | 0% | |
| Moderate Risk Hazards | 4 | 40% | ALARP |
| Minor Risk Hazards | 2 | 20% | |
| Low Risk Hazards | 4 | 40% | |
| Total | 10 | 100% | |

As shown above, after mitigation, none of the hazards is High or Extreme Risk, and all hazards are (or can be made) ALARP.

4.4 This NRA identifies what the hazards and risks are. The means by which these risks can be managed are to be set out in a separate Marine Safety Management Plan

Appendix 1 – Risk assessment Records

| RISK ASSESSMENT MATRIX: RISK CRITERIA | | FREQUENCY | | | | |
|---------------------------------------|---|--|----------------------------|-------------------------------|----------------------------|----------------------------|
| | | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| | | Rare | Unlikely | Possible | Likely | Almost Certain |
| | | One or more times greater than 100 | One or more times 100 year | One or more times in 10 years | One or more times per year | Ten or more times per year |
| Consequence | 5 – Loss of vessel or severe damage to vessel / environment. Multiple fatalities International news coverage. | Moderate (5) | High (10) | Extreme (15) | Extreme (20) | Extreme (25) |
| | 4 – Major damage to vessel / environment. Single Fatality. National news coverage. | Minor (4) | Moderate (8) | High (12) | Extreme (16) | Extreme (20) |
| | 3 – Moderate damage to vessel / environment. Moderate / major injury Regional news coverage. | Minor (3) | Moderate (6) | Moderate (9) | High (12) | Extreme (15) |
| | 2 - Minor or superficial damage to vessel / environment. Minor injuries and local news coverage. | Slight (2) | Minor (4) | Moderate (6) | Moderate (8) | High (10) |
| | 1 - Insignificant or no damage to vessel / equipment / environment. No injuries. | Slight (1) | Slight (2) | Minor (3) | Minor (4) | Moderate (5) |
| ACTION KEY | Slight (1 – 2) | No Action is required | | | | |
| | Minor (3 – 4) | No additional controls are required, monitoring is required to ensure no changes in circumstances | | | | |
| | Moderate (5 – 9) | Efforts should be made to reduce risk to 'As low as reasonably practicable' (ALARP), but activity may be undertaken | | | | |
| | High (10 – 14) | Efforts should be made to reduce risk to 'As low as reasonably practicable' (ALARP). Activity can only be undertaken with further additional controls. | | | | |
| | Extreme (15 – 25) | Intolerable risk. Activity not authorised | | | | |

ASSESSMENT OF RISKS AT STAFFIN

| Hazard No. | Hazard Description and Existing RCOs | Raw Scores | | | Additional Risk Control Options (RCOs) If Necessary | Mitigated Scores | | |
|------------|--|------------|---|----|---|------------------|---|---|
| | | F | C | R | | F | C | R |
| 1 | Construction plant obstructing slipway | 2 | 1 | 2 | Defer to RAMS, but no further mitigations considered necessary | 2 | 1 | 2 |
| | Plant / lifting gear on foreshore if possible. RAMS will determine | | | | | | | |
| | Plant unable to operate from slipway | | | | | | | |
| | Main risk is inconvenience rather than safety | | | | | | | |
| 2 | Collapse of construction plant at or near slipway | 2 | 5 | 10 | Users of slipway to be excluded when lifts taking place | 1 | 5 | 5 |
| | All lifting gear certified and maintained in sound working order | | | | | | | |
| | Construction staff duly trained in operating equipment | | | | | | | |
| | All lifts in accordance with planned procedures | | | | | | | |
| 3 | Dropped objects during dismantling of existing breakwater | 2 | 1 | 2 | Any dropped objects to be recorder and recovered | 2 | 1 | 2 |
| | All lifting gear / strops / slings to be rated for each lift | | | | | | | |
| | Lifting gear to be regularly inspected | | | | | | | |
| | Each load to be visually monitored throughout. | | | | | | | |
| 4 | Cables and tripping hazards on slipway | 2 | 1 | 2 | Defer to RAMS, but no further mitigations considered necessary | 2 | 1 | 2 |
| | Plant / lifting gear on foreshore if possible. RAMS will determine | | | | | | | |
| | Plant unable to operate from slipway | | | | | | | |
| | Main risk is inconvenience rather than safety | | | | | | | |
| 5 | Breakwater - Planned underwater obstruction - grounding hazard | 4 | 3 | 12 | Extremity of breakwater base to be marked by buoys (west, east, and north) as it "grows" out from the land Notices to Mariners (NtoM) to be issued to reflect progress of construction of breakwater Site Managercontact details to be publicly available | 2 | 3 | 6 |
| | New breakwater is constructed only from the land, no marine craft. | | | | | | | |
| | New material will be laid/dropped on to the sea bed. This reduces the navigable depth and is unsighted until construction breaks surface | | | | | | | |
| | Craft navigating in east part of bay exposed to grounding risk in area of the "footprint" of the new breakwater | | | | | | | |

ASSESSMENT OF RISKS AT STAFFIN

| Hazard No. | Hazard Description and Existing RCOs | Raw Scores | | | Additional Risk Control Options (RCOs) If Necessary | Mitigated Scores | | |
|------------|---|------------|---|----|---|------------------|---|---|
| | | F | C | R | | F | C | R |
| 6 | Breakwater - Unplanned underwater obstruction - grounding hazard | 2 | 3 | 6 | Any such dropped material is marked with a buoy or is recovered | 1 | 3 | 3 |
| | Breakwater material falls outside of defined construction area and remains submerged | | | | | | | |
| 7 | Slipway - Planned underwater obstruction - grounding hazard | 4 | 3 | 12 | Extremity of slipway base to be marked by buoys (west, north, and south) as it "grows" out from the land Notices to Mariners (NtoM) to be issued to reflect progress of construction of breakwater Site Managercontact details to be publicly available | 2 | 3 | 6 |
| | New slipway is constructed only from the land, no marine craft. New material will be laid/dropped on to the sea bed. This reduces the navigable depth and is unsighted until construction breaks surface Craft navigating in east part of bay exposed to grounding risk in area of the "footprint" of the new slipway | | | | | | | |
| 8 | Slipway - Unplanned underwater obstruction - grounding hazard | 2 | 3 | 6 | Any such dropped material is marked with a buoy or is recovered | 1 | 3 | 3 |
| | Slipway material falls outside of defined construction area and remains submerged | | | | | | | |
| 9 | Cables and tripping hazards in vehicle turning / tender storage area | 2 | 1 | 2 | Defer to RAMS, but no further mitigations considered necessary | 2 | 1 | 2 |
| | Working areas to be defined and fenced. RAMS will determine Main risk is inconvenience rather than safety | | | | | | | |
| 10 | Collapse of construction plant at or near new breakwater or slipway | 2 | 5 | 10 | Navigation to be excluded within area delineated by buoys | 1 | 5 | 5 |
| | All lifting gear certified and maintained in sound working order Construction staff duly trained in operating equipment All lifts in accordance with planned procedures | | | | | | | |

Appendix 2 Indicative Contents / Scope of Contractors RAMS

All civil engineering contractors will have in-house RAMS which align with codes and standards for that industry. Whilst the contractor for the Staffin works is not yet conformed, the following Appendix lists the areas of detail which STC should expect from the contractor's RAMS prior to mobilisation to site and commencement of work.

1. Method Statement Control Sheet
2. Identification of Plant/Equipment
3. Identification of PPE
4. Location of Site and Access Arrangements
5. Overview of the Works
6. Methodology for Main Tasks (Piling; Lifting; Concrete Pouring etc)
7. Permits
8. Operatives on Site
9. PPE
10. Plant, Tools and Equipment
11. Working at Height
12. Working Near the Water
13. Working Afloat
14. Marking of Submerged Obstructions
15. Liaison with Stakeholders
16. Notices to Mariners
17. Tidal Conditions
18. Unexploded Ordnance (UXO)
19. Manual Handling
20. Hand Arm Vibration (HAV) Monitoring
21. Asbestos
22. Burning, Cutting and Welding
23. Lifting Operations
24. Unloading Lorries
25. Refuelling (Large Plant and Smaller Items)
26. COSHH
27. Emergency Contacts
28. Site First Aid
29. Site Visitors and Security
30. Relevant Documents
31. Record of Minor Changes



Appendix 12D – Marine Safety and Navigational Management Plan



**Proposed Staffin Harbour Development
Marine Safety and Navigational Management Plan
(MSNMP)**

Final 28 11 2023

Drennan Marine Consultancy Ltd

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Abbreviations

| | |
|-------|---|
| ALARP | As Low As Reasonably Practicable |
| AtoN | Aid(s) to Navigation |
| CD | Chart Datum |
| COSHH | Control of Substances Harmful to Health |
| DP | Designated Person |
| DMC | Drennan Marine Consultancy Ltd |
| FRA | Formal Risk Assessment |
| GA | General Arrangement |
| HEO | Harbour Empowerment Order |
| IMO | International Maritime Organisation |
| MCA | Maritime & Coastguard Agency |
| MHWS | Mean High Water Springs |
| MHWN | Mean High Water Neaps |
| MLWN | Mean Low Water Neaps |
| MLWS | Mean Low Water Springs |
| NLB | Northern Lighthouse Board |
| NRA | Navigational Risk Assessment |
| NtoM | Notice(s) to Mariners |

| | |
|------|------------------------------------|
| PMSC | Port Marine Safety Code |
| RAMS | Risk Assessment / Method Statement |
| RCO | Risk Control Option |
| SCT | Staffin Community Trust |
| SHA | Statutory Harbour Authority |
| SUP | Stand-Up Paddleboard |
| UXO | Unexploded Ordnance |

References

| | |
|---|---|
| 1 | Marine Scotland License MS-00009582 (6 th Oct 2022) |
| 2 | Navigational Risk Assessment (Final Version) by Drennan Marine Consultancy Ltd dated 23/11/23 |
| 3 | Construction Environmental Management Document for Staffin Harbour by Affric Ltd |

1 - Context

To discharge the conditions set out in section 3.2.6 of the provisional License¹ to develop the harbour at Staffin, the harbour owners - Staffin Community Trust (STC) - are required undertake a number of studies to demonstrate that safety and environmental good practice will not be compromised during the construction phase of the harbour improvements.

The proposed development will comprise:

- Demolition of the existing breakwater
- Use of material from that breakwater within the construction of a new, larger, breakwater on the east side of the bay
- Construction of a new, wider, slipway from the new breakwater in deeper water with better tidal access
- Installation of an array of pontoon berths with pedestrian access from the breakwater via a hinged brow
- Improved utilities, storage, and marine support facilities.

One such Licence obligation is to carry out a Navigational Risk Assessment (NRA) to identify and mitigate marine risks during the construction works at the harbour. That study [Reference 2] essentially identified *what* the marine / navigational risks were during the construction phase.

Another License obligation is to demonstrate *how* those risks will be monitored and managed during the construction phase by means of a Marine Safety Management Plan (MSMP). This document is the MSMP.

2 - Staffin Community Trust (SCT)

The Licensee and sponsor for the harbour project is Staffin Community Trust, a local Trust and Limited Company established for the purpose of improving the Staffin area (including the harbour) for local residents, visitors and businesses in beneficial and sustainable ways.

STC does not and will not have the status of a Statutory Harbour Authority (SHA). However, this MSMP is to be regarded as a document owned by SCT or any organisation / operating company duly constituted by SCT to act on their behalf in harbour matters.

3 - Scope of this Marine Safety Management Plan

Just as the Navigational Risk Assessment scope reflects only marine activities and marine risk during the construction works, this MSMP is also only for the duration of the harbour construction works listed briefly above and more fully in the License and the associated Construction Environmental Management Document (CEMD)³.

Upon completion and commissioning of the harbour works and de-mobilisation of the construction plant and material (ie when the “new harbour” becomes an operational entity free of major construction activity), SCT recognises that a new NRA and MSMP must be developed and implemented to reflect the activities and risks in place at that time and going forward.

4 - Navigational Risk(s)

In sections 4.1 and 4.2 of the NRA it is concluded that:

“This NRA has been carried out using the format most normally applied for major port developments – which is, arguably, a bit of “overkill” given that:

- a) **The marine activities at the harbour are minimal, and**
- b) **All the risks during the construction phase are to be defined and mitigated by the contractor though their detailed RAMS.**

However, this NRA has concluded that there are some particular risks which SCT and the contractor must be made aware of. Some of these are true “navigation” risks (eg grounding on the submerged parts of the new breakwater or new slipway) but most are “industrial” risks (eg obstructions from and failures of construction equipment)”.

The summary results from the NRA are shown in the tables below.

| ASSESSMENT OF RISKS AT STAFFIN HARBOUR | | | | | | | |
|--|--|------------|---|----|------------------|---|---|
| Hazard No. | Hazard and Existing RCOs | Raw Scores | | | Mitigated Scores | | |
| | | P | C | R | P | C | R |
| 1 | Construction plant obstructing slipway | 2 | 1 | 2 | 2 | 1 | 2 |
| 2 | Collapse of construction plant at or near slipway | 2 | 5 | 10 | 1 | 5 | 5 |
| 3 | Dropped objects during dismantling of existing breakwater | 2 | 1 | 2 | 2 | 1 | 2 |
| 4 | Cables and tripping hazards in slipway area | 2 | 1 | 2 | 2 | 1 | 2 |
| 5 | Breakwater - Planned underwater obstruction (grounding hazard) | 4 | 3 | 12 | 2 | 3 | 6 |
| 6 | Breakwater - Unplanned underwater obstruction (grounding hazard) | 2 | 3 | 6 | 1 | 3 | 3 |
| 7 | Slipway - Planned underwater obstruction (grounding hazard) | 4 | 3 | 12 | 2 | 3 | 6 |
| 8 | Slipway - Unplanned underwater obstruction (grounding hazard) | 2 | 3 | 6 | 1 | 3 | 3 |
| 9 | Cables and tripping hazards in vehicle turning / tender storage area | 2 | 1 | 2 | 2 | 1 | 2 |
| 10 | Collapse of construction plant at or near new breakwater or slipway | 2 | 5 | 10 | 1 | 5 | 5 |

| AFTER MITIGATION | | | ALARP |
|-----------------------|-----------|-------------|-------|
| Risk Type | No. | % | |
| Extreme Risk Hazards | 0 | 0% | |
| High Risk Hazards | 0 | 0% | |
| Moderate Risk Hazards | 4 | 40% | |
| Minor Risk Hazards | 2 | 20% | |
| Low Risk Hazards | 4 | 40% | |
| Total | 10 | 100% | |

5 - Contractor's Obligations and RAMS

As is common practice during a marine civil construction project, the client (SCT) will contract with a civil engineering Contractor (the Contractor) to undertake all the works in accordance with the design brief and the wide range of conditions attaching to the brief and the License.

As it is the Contractor's workforce, plant, and materials being used throughout the construction process, it is rightfully the responsibility of the Contractor to have demonstrably safe practices and environmentally sustainable conditions at all times. The key working document(s) to capture this is the Contractor's Risk Assessment and Method Statement (RAMS).

A Contractor's RAMS documents will have some parts that are company and industry specific (eg references to Company procedures; Company contacts; industry codes and standards etc) and some parts that are project and location specific for that particular works (local conditions; local emergency contacts; client contact details etc.)

As no Contractor has yet been appointed for the civil works which will impinge on navigation and other marine activities, no marine civils Contractor's RAMS are available to include within this MSMP. However, a contractor (GF Job Ltd) has been appointed for the land reclamation work above MLWS and has participated with the project's civil engineering consultants (Wallace Stone) to provide an indicative methodology for the works below MLWS. This indicative methodology has informed the NRA and this MSMP. An *indicative* list of contents for RAMS for a project such as proposed for Staffin is included at Appendix 2 for information purposes.

6 - Marine Safety Management Plan

Responsibility

Prime responsibility for safety at the harbour, its waters, its approaches, and the construction site lies with the Contractor from commencement of mobilisation to site until after commissioning and demobilisation from site.

This responsibility will be reflected in contract documentation between SCT and Contractor. The project's consulting engineers (Wallace Stone) will manage the construction contract on behalf of SCT and provide oversight of the Contractor's activities to ensure adherence to the MSMP.

RAMS

The Contractor shall produce detailed RAMS for each work activity, and these shall be submitted to SCT prior to commencement of work.

Site Area and Free Areas

The Contractor shall identify which areas are required for working; storage; laydown; vehicular access and storage; welfare facilities; office facilities and all similar project related

requirements. Such areas are to be denoted with fencing and signage to an appropriate level such that harbour users and the public are duly aware that industrial and construction areas may be hazardous.

Contractor shall ensure that, as far as possible, harbour users at the existing slipway are not inconvenienced or endangered.

Any temporary closures of roads, paths, public rights-of-way shall be undertaken in conjunction with local authority procedures, with prior notification being given and duly advertised to relevant parties and the public.

Security

Security of the Contractor's area, equipment, plant, and materials is entirely the responsibility of the Contractor. This includes all suppliers and subcontractors engaged by the Contractor.

Record Keeping

The Contractor shall maintain a hard or/and electronic copy of all working personnel and visitors to the site each day. If the use of "Permits to Work" form part of the Contractor's RAMS, then these records shall also be retained. All records shall be provided to SCT on demand and retained until completion of de-mobilisation from site

Traffic

The Contractor is expressly required to note and confirm adherence to the traffic sections of the Environmental Impact Statement (EIS) and the Construction Environmental Management Document (CEMD).

Medical Facilities and Emergency Response

The Contractor's Site Office shall maintain a First Aid Kit with capability to attend to minor level workplace injuries which might be reasonably anticipated in a marine civil engineering site.

Records of all workplace injuries shall be entered into and retained within a site "Accident Book".

The nearest Accident & Emergency facilities are at Broadford Hospital, High Road, Broadford, Isle of Skye IV49 9AA.

Oil and Waste Management

The Contractor shall ensure that all fuel and lubricating oils are held securely at site and that fuelling of mechanised plant is carried out without any release of pollutants into the ground or the water. Harmful materials shall be stored and handled in compliance with COSHH Regulations and a waste management plan shall be developed and implemented for the site.

Marine Hazard Management – Existing Slipway

The Navigational Risk Assessment highlighted a particular hazard (albeit moderate risk level) to harbour users using the existing slipway whilst demolition of the existing breakwater is being undertaken. The hazard is that material being lifted from the old breakwater might fall causing injury to slipway users or damage to tenders.

The Contractor is expressly required to note this hazard and to mitigate risk to users of the slipway by:

- Consulting with users of the slipway to ascertain the daily and weekly intended use of the slipway by all users;
- Based on that consultation, developing a daily and weekly schedule of work which will avoid demolition and lifting activities whilst slipway users require outward or inward access from the slipway;
- Promulgating the daily and weekly work schedule for demolition of the existing breakwater to harbour users and SCT
- Providing a means of communication by which the site supervisor might be contacted by slipway users and by SCT (ie hand-held marine band vhf radio and cell phone);
- Ceasing demolition and lifting operations at the existing slipway if a harbour user or SCT has reasonable cause to require this.

Marine Hazard Management – New Breakwater and Slipway

The Navigational Risk Assessment highlighted a particular hazard (albeit moderate risk level) to harbour users approaching from and departing to the east where the new breakwater is being constructed. The hazard is that craft might run aground on the submerged (and therefore unsighted) lower levels of the base of the new breakwater. (The hazard will substantially reduce when the base of the new structure “breaks the surface” of the water, which will be variable dependant on the level of new breakwater and the height of tide).

The Contractor is expressly required to note this hazard and to mitigate risk to users of the slipway by:

- Developing a weekly schedule of work which advises harbour users and SCT of the growing “footprint” and height above MLWS which the breakwater is expected to achieve during that week;
- Deploying an appropriate pattern of buoys to delineate an Exclusion Zone around the area where a grounding risk is deemed to exist;
- Promulgating the weekly work schedule as the “footprint” and height above MLWS grows;
- Providing a means of communication by which the site supervisor might be contacted by harbour users and by SCT (ie hand-held marine band vhf radio and cell phone);
- Ceasing breakwater construction work if a harbour user or SCT has reasonable cause to require this.

Use of Local Notices to Mariners (NtoM)

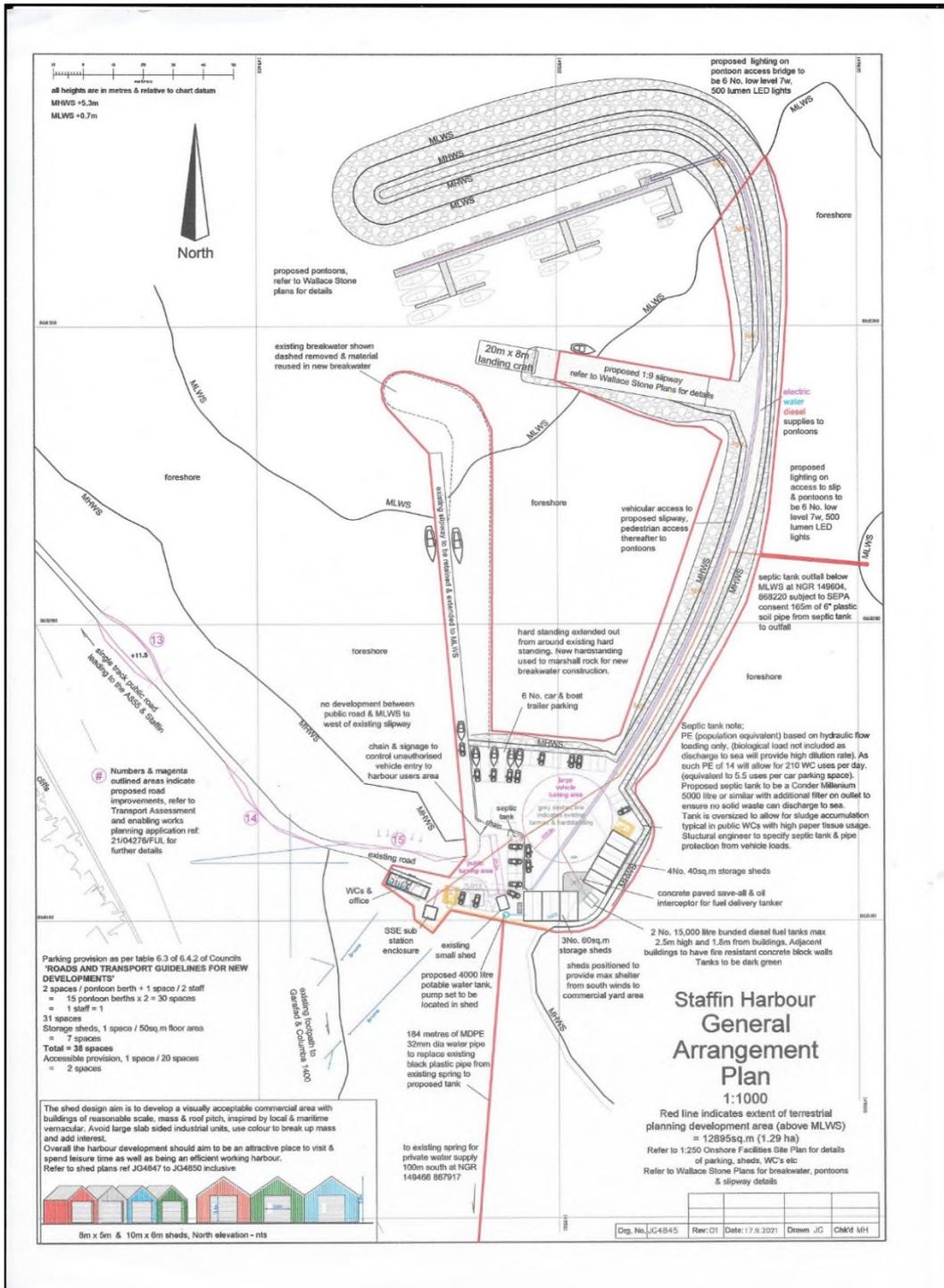
The Contractor shall, in conjunction with SCT, develop and utilise a system of Local Notices to Mariners as the prime means of promulgating navigationally relevant information.

In addition to the use of NtoM for the specific hazards detailed above, a NtoM shall be issued to an appropriate distribution list of relevant regulatory and commercial / leisure bodies such as:

- Highland Council Harbour Master
- Portree Harbour Master
- Uig Harbour Master
- Organic Sea Harvest
- RNLI Portree
- Skye Sailing Club, Portree
- HM Coastguard, Portree
- HM Coastguard, Stornoway
- Local fishing boat owners
- Local social media accounts

Note: This list will be updated prior to commencement of works and as required

Appendix 1 – General Arrangement of Proposed Harbour Works



Appendix 2 - Indicative Contents / Scope of Contractors RAMS

All civil engineering contractors will have in-house RAMS which align with codes and standards for that industry. Whilst the contractor for the Staffin works is not yet conformed, the following Appendix lists the areas of detail which STC should expect from the contractor's RAMS prior to mobilisation to site and commencement of work.

1. Method Statement Control Sheet
2. Identification of Plant/Equipment
3. Identification of PPE
4. Location of Site and Access Arrangements
5. Overview of the Works
6. Methodology for Main Tasks (Piling; Lifting; Concrete Pouring etc)
7. Permits
8. Operatives on Site
9. PPE
10. Plant, Tools and Equipment
11. Working at Height
12. Working Near the Water
13. Working Afloat
14. Marking of Submerged Obstructions
15. Liaison with Stakeholders
16. Notices to Mariners
17. Tidal Conditions
18. Unexploded Ordnance (UXO)
19. Manual Handling
20. Hand Arm Vibration (HAV) Monitoring
21. Asbestos
22. Burning, Cutting and Welding
23. Lifting Operations
24. Unloading Lorries
25. Refuelling (Large Plant and Smaller Items)
26. COSHH
27. Emergency Contacts
28. Site First Aid
29. Site Visitors and Security
30. Relevant Documents
31. Record of Minor Changes

Appendix 3 - Contact Details

| Organisation | Name | Telephone | Email |
|--|---------------------|-----------------|------------|
| Staffin Community Trust | Hugh Ross | 01470 562464 | [Redacted] |
| GF Job Ltd (land Reclamation Contractor) | Adrian Johnstone | | |
| Broadford Hospital | | 01471 822491 | |
| Affric Ltd (Environmental and Planning Consultants) | Fiona Henderson | 01808 521498 | |
| Wallace Stone (Consultant Engineers) | Donald Armstrong | 01851 600220 | |
| Portree RNLI | | 01478 613610 | |
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Note: This Appendix Will Be Updated Prior to Commencement of Works and As Required



| Construction Environmental Management Document | |
|---|--|
| Section Number | 13 |
| Section Title | Habitat and Species Protection Plan |
| Issue | 2 |
| Issue Date | 15/12/2023 |
| Author | Rhona Taylor and Daisy Hodge |
| Approved | Fiona Henderson |

| Document History | | |
|-------------------------|-------------|---|
| Issue | Date | Reason for Change |
| 1A | 31/03/2022 | Issue for client review |
| 1 | 30/03/2023 | Issue to planning authority |
| 2A | 22/11/2023 | Reviewed in light of Marine Licence Conditions – No Change Made |
| 2 | 15/12/2023 | Issue to Marine Scotland |

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13 Habitat and Species Protection Plans

13.1 Introduction

There are a number of ecologically designated areas in and around the Staffin Community Harbour development, as detailed in Table 13.1.

Table 13.1: List of Relevant Designated Sites

| Designation | Name | Location Relative to Development | Relevant Qualifying Features |
|------------------------------------|-------------------------------|----------------------------------|------------------------------|
| Special Area of Conservation (SAC) | Inner Hebrides & the Minches | Overlaps with development | Harbour porpoise |
| Special Area of Conservation (SAC) | Ascrib, Isay & Dunvegan | 29km W | Common seal |
| Marine Protected Area (MPA) | Red Rocks and Longay (urgent) | 39km SW | Flapper skate |
| Marine Protected Area (MPA) | Sea of the Hebrides | 46km SW | Basking shark, Minke whale |
| Marine Protected Area (MPA) | North East Lewis | 52km | Risso's dolphin |
| Special Area of Conservation (SAC) | Monach Islands | 102km W | Grey seal |

Habitat and Species Protection Plans have been developed to ensure that all concerned are aware of the specific issues associated with the species of concern. All mitigation is included within Section 14: Schedule of Mitigation, to aid implementation within the Construction Environmental Management Plans (CEMPs) detailed in Section 6.

In addition to the protection of specific species, the management of Non-Native Species has been included in Sections 13.6 and 13.7.

13.2 Marine Mammals Protection Plan

13.2.1 Introduction

Evidence suggests that there is little potential for various marine mammal species to be within the area of the development. Species which have been frequently recorded in the area however, include both common and grey seals and harbour porpoise.

Marine mammals can be affected by changes in water quality and disturbance and physical injury from moving plant and vessel interactions. Water quality will be managed as described in Section 9 of this CEMD and as such is not considered further in this section. The protection measures associated with marine mammals and outlined in this section are with regards to disturbance and physical injury.



13.2.2 Protection and Offences

The main legislation with regard the protection of seals is The Marine (Scotland) Act 2010, which provides for Scottish Ministers to designate 'seal conservation areas.' Under the Marine (Scotland) Act 2010, it is an offence to kill, injure or take a seal, as well as to deliberately or recklessly harass a seal at a significant haul out site.

In addition, seals are listed under Annex II of the Habitats Directive (transposed into Scottish Law), meaning that their core habitat must be protected under the Natura 2000 Network (see Table 13.1) and managed in accordance with their ecological requirements.

Whales and dolphins are classed as European Protected Species (EPS) and are fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). In addition, all cetaceans are listed under Schedule 2 of the Habitats Directive, meaning it is an offence to:

- Deliberately capture or kill a wild animal of a European protected species;
- Deliberately disturb any such animal;
- Deliberately take or destroy the eggs of such an animal; or
- To damage or destroy a breeding site or resting place of such an animal.

The Wildlife and Countryside Act 1981, and Nature Conservation (Scotland) Act 2004 provide further protection to marine mammals. Cetaceans are listed in Schedule 5 of the Wildlife and Countryside Act 1981, which prohibits their deliberate killing, injuring or disturbance. The Nature Conservation (Scotland) Act 2004 makes amendments to the Wildlife and Countryside Act in Scottish waters, including the addition of 'reckless' acts, to offences against species protection. This makes it an offence to disturb a cetacean intentionally, or recklessly.

13.2.3 Mitigation

To minimise the risk of direct physical injury to all marine mammals, particularly seal species, construction staff will be briefed to look for marine mammals in the vicinity of the works. This will be especially important at the start of the day or after a break, when seals are most likely to be hauled out on the foreshore. Activities will not start or will be stopped if individuals approach closer than 50m to the works. They will be required to cease until such a time that the individuals have moved further than 50m away. This includes works which involves the placement of materials in the water, such as land reclamation works and the during the construction of the new breakwater.

In addition, as disturbance can be caused by interaction with vessels, all vessels are required to comply with the Scottish Marine Wildlife Watching Code at all times (see Appendix 13A).

13.3 Terrestrial Ecology Protection Plan

13.3.1 Introduction

The EIAR identified potential impacts on grassland and groundwater dependent habitats, otter and breeding birds. This Terrestrial Ecology Protection Plan only considers mitigation outlined to prevent disturbance to vegetation and other habitats however, as otter and breeding birds are considered in 13.4 and 13.5 respectively.



Vegetation and habitats such as Groundwater Dependent Terrestrial Ecosystems (GWDTE) and acidic or neutral grasslands can be impacted upon through habitat loss, habitat disturbance, physical damage, and pollution incidents.

13.3.2 Protection and Guidance

Habitats identified as potential Ground Water Dependent Terrestrial Ecosystems (GWDTE), are protected under the Water Framework Directive (Directive 2000/60/EC) (European Commission, 2000) and transposed into Scottish law through the Water Environment and Water Services (Scotland) (WEWS) Act 2003. This means any disturbance to the groundwater resource on which a particular GWDTE relies, would be a breach of legislation.

In addition, Section 13 of the Wildlife and Countryside Act 1981 (WCA) identifies the protection measures for wild plants. It *"prohibits the unauthorised intentional uprooting of any wild plant species and forbids any picking, uprooting or destruction of plants"* listed on Schedule 8.

13.3.3 Mitigation

Potential impacts were identified for several terrestrial habitats resulting from water quality issues associated with the loss of containment of hazardous substances. Mitigation measures associated with water quality are outlined in Section 9.

With regards to habitat loss, disturbance and physical damage, construction plant will be required to be precise when stripping vegetation within the construction footprint, to minimise disturbance to the surrounding vegetation. Any edges of the remaining habitat will be required to be sealed, to prevent any habitats from drying out. This particularly applies to marshy grassland areas, which may be considered as moderate-to-high GWDTEs in some areas.

Where exposed areas of habitat remain, turves from removed habitat within the construction footprint will be used to surface any exposed edges if possible.

Finally, where vegetation is temporarily removed, this will be required to be reinstated as quickly as possible. This item of mitigation is specific to the laying of the water pipe which will feed the harbour buildings, but also applies to the wider construction area.

13.4 Otter Protection Plan

13.4.1 Introduction

Otters are widespread across the west coast of Scotland and initial surveys have indicated that otters pass through the site on a regular basis. Both the proposed Community Harbour development and Lealt Borrow Pit areas offer highly suitable habitat for hunting and as a potential place of shelter.

Within the proposed Staffin Community Harbour development area, extensive opportunities exist for otters to use the area as a place of shelter. The most suitable areas were beneath the many very large boulders located on the slope at the base of the cliffs.

Close to the Lealt Borrow Pit, otter activity appears to be most prominent close to the gully at the east of the quarry. All otter field signs found were within 30m of the planning boundary.



The features identified comprised of two sprainting sites which may in the past also be used as a couch.

13.4.2 Protection and Offences

Otters are listed in Annex IV of the Habitats Directive as EPS where the deliberate killing, disturbance or the destruction of these species or their habitat is banned. They are fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). Otters are also listed in the Scottish Biodiversity List, the UK Biodiversity Action Plan (BAP) and are included in the Highland BAP.

Otters are included in Schedule 2 of the Habitats Regulations 2010 (in relation to reserved matters), which is into Scottish law by a combination of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland) and The Wildlife and Countryside Act 1981. This means it is an offence to:

- Deliberately or recklessly capture, injure or kill, harness, damage or destroy a breeding site or resting place of an EPS or a group of EPS;
- Disturb an EPS while it is occupying a structure or place which it uses for shelter or protection;
- Disturb an EPS while it is rearing or otherwise caring for its young;
- Obstruct access by an EPS to a breeding or resting place, even if they are not in use at the time;
- Disturb an EPS in a manner that is, or circumstances which are, likely to significantly affect the local distribution or abundance of that species;
- To disturb an EPS in a manner that is, or in circumstances which are likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young; and
- Damage or destroy a breeding site or resting place of an EPS even if they are not in use at the time.

Developers may apply for a licence, if necessary, from NatureScot to allow proposed development works that might affect EPS to proceed legally.

Active otter shelters are legally protected whether or not an otter is present.

13.4.3 Mitigation

Pre-construction surveys for otter will be carried out prior to construction, as per Planning Condition 11 of Planning Consent 21/04521/FUL and Planning Consent 21/04525/FUL.

Should pre-construction surveys identify use of the habitat by otter, the potential for disturbance, subsequent further survey work and/or the requirements for an EPS licence under the Conservation (Natural Habitats &c.) Regulations 1994 as amended in Scotland from NatureScot will be considered. This will include the need for tailored mitigation measures to be included into species protection plans.



In the unlikely event that a previously undiscovered otter resting place is identified during the works, works will stop within 30m of the feature. In the unlikely event that a previously undiscovered and active natal holt is identified, works will stop within 200m of the feature. Appropriate mitigation measures will be identified through consultation with the ECoW and NatureScot, as necessary. Works will not recommence in the affected area until suitable mitigation measures and licencing is in place.

As it is likely otter pass through the site, measures to protect otter should be implemented regardless of a place of shelter being identified.

- A toolbox talk will be delivered to site operatives by the ECoW detailing the considerations that should be given to otters during construction.
- Works should be carried out in daylight, where practicable and the use of artificial lighting should be minimised where possible and directed towards the works area away from the water.
- Measures to prevent entrapment such as capping pipes/tubes or storing upright, ensuring open excavations are suitably fenced off or ramp exits provided.
- All machinery, stockpiles, and equipment should be checked thoroughly, with a torch if required, for otter prior to use.
- Any temporary buildings and waste control areas should be secured to prevent access by mammals and other wildlife.
- Speed limits of 10mph should be implemented within the Lealt Borrow Pit and adhered to, to minimise the chance of collision.
- Noise and vibration sources should be minimised where possible, for example, vehicles and plant should be switched off or throttled down when not in use (see Section 11: Noise and Vibration).
- Measures also noted in Section 9: Water Quality, will provide protection for otter using the watercourses within and around the site for commuting, foraging, and feeding and cleaning their fur.

In the event that a potential otter holt is identified within 200m of the construction site during works, works should cease within 200m of the location. The ECoW should be made aware and will provide advice.

13.5 Breeding Birds Protection Plan

13.5.1 Introduction

Various records of bird species have been recorded in and around the site. The waterbodies and some habitats identified such as grassland, offer some suitability for local breeding birds including ground nesting species.

13.5.2 Protection and Offences

All wild birds are protected under the Wildlife and Countryside Act 1981 (as amended). Additional protection is afforded to some rarer species and to species vulnerable to disturbance and/or persecution through various schedules attached to the Act.



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

For any wild bird species listed on Schedule 1, it is an offence to disturb:

- any bird while it is building a nest
- any bird while is in, on, or near a nest containing eggs or young
- any bird while lekking
- the dependent young of any bird

For any wild bird species listed on Schedule 1A, it is an offence to harass any bird intentionally or recklessly.

For any wild bird species listed on Schedule A1, it is an offence to intentionally or recklessly take, damage, destroy or interfere at any time with a nest habitually used by any bird.

13.5.3 Mitigation

Pre-construction surveys for breeding birds will be carried out prior to the start of construction works in the breeding season.

During the bird breeding season, the ECoW should carry out regular checks of the construction area and adjacent land to identify nests. If found, then an exclusion zone appropriate to the species will be implemented, a toolbox talk will be given to make sure that all onsite workers are aware to avoid the nest and exclusion area. If, additional mitigation is required, this species protection plan will be updated.

As with other species, artificial lighting within the site should only be used where required to light works sites and for safety reasons and should be directional towards the required works area.

13.6 Invasive Non-Native Species (INNS) Plan

13.6.1 Introduction

No INNS have been identified on the site during. However, the consequences of introducing non-native species into the local terrestrial ecosystem includes:

- Damage or displacement of indigenous species;
- Disruption of sensitive ecosystem balance;
- The spread of foreign diseases which severely affect native species;
- Damage to buildings and infrastructure; and
- Significant economic costs associated with the control and management of invasive species.



13.6.2 Mitigation

Prior to any vegetation clearance the ECoW should check to ensure that there are no INNS present if found appropriate treatment and disposal relevant to the species present will be required.

All plant and equipment brought to site should be free of material, to prevent import of INNS from other sites

13.7 Marine Non-Native Species (MNNS) Plan

13.7.1 Introduction

The consequences of introducing non-native species into the local marine ecosystem includes;

- Damage or displacement of indigenous species;
- Disruption of sensitive ecosystem balance;
- The spread of foreign diseases which severely affect native species;
- Damage to buildings and marine infrastructure; and
- Significant economic costs associated with the control and management of invasive species.

13.7.2 Mitigation

All works will be carried out in accordance with The Code of Practice on Non-Native Species (approved by Scottish Parliament 28 June 2012). This adopts a precautionary approach to minimise the risk of releasing Marine Non-Native Species (MNNS), using risk assessments relevant to planned activities and seeking advice on best practice whenever necessary. This includes reporting the presence of non-native species.

Appropriate measures will be implemented to reduce the risk of MNNS introduction. These will include:

- **Marine Plant (Not Road Transportable):**
 - Vessel employed to support the project will be sourced from within relevant biogeographic boundaries wherever possible i.e., within the Sea of Hebrides and West Coast Atlantic ecosystem; and
 - All vessels working on the project will be compliant with the relevant requirements of the International Maritime Organisation, where vessels should be inspected prior to mobilisation to site to ensure that they are not subject to excessive biofouling.
- **Road Transportable Equipment (Plant, Vehicles and Small Boats):**
 - All equipment is to be received in an 'as new' standard;
 - Salt water will be drained from every part of the plant, boat or any other item which could transport water from the marine environment, prior to being mobilised to site or demobilised from it;
 - All parts of plant, equipment or boats that come into contact with the water will be thoroughly cleaned before being mobilised to or demobilised from the site, removing any visible algae, fish, shellfish, and soils;



- Any algae, fish, shellfish or soils removed from plant or equipment during routine cleaning will be disposed of in a designated bin or skip;
- Operators will avoid travelling through marine plants and weed where possible, to prevent organic matter becoming entangled in tracks, propellers etc. and transport around the site; and
- All equipment will be inspected prior to mobilisation on site; any equipment carrying excessive sediment deposits will be returned to the supplier.
- **Materials:**
 - All materials used during the construction of the Staffin Community Harbour development will be free from marine organic matter and sourced from areas free from known MNNS.

In event that invasive species are suspected the relevant authorities will be contacted by the ECoW or Project Manager.

- SEARS (Scottish Environment & Rural Services): 08452 302050
- SNH: non_native_species@snh.gov.uk
- Marine Scotland: marinescotland@scotland.gsi.gov.uk - 01224 876544
- SEPA: http://www.sepa.org.uk/about_us/contacting_sepa.aspx



Appendix 13A – Scottish Marine Wildlife Watching Code

The Scottish Marine Wildlife Watching Code



Preface

This Code has been produced in fulfilment of the requirement under Section 51 of the Nature Conservation (Scotland) Act 2004 for Scottish Natural Heritage (SNH) to:

“Prepare and issue a code, to be known as the Scottish Marine Wildlife Watching Code, setting out recommendations, advice and information relating to commercial and leisure activities involving the watching of marine wildlife”.

The Act states that the Code may contain information on:

- Activities which are likely to disturb marine wildlife.
- Circumstances in which marine wildlife may be approached.
- The manner in which marine wildlife may best be viewed with minimum disturbance.

The Act also requires SNH to consult others in the development of the Code, to publish and promote the Code and, periodically, to review the Code. The Code was first published in 2006. A revision was undertaken in 2016 to reflect changes in relevant legislation since 2006.

This Code is an opportunity to draw together information relating to best practice on watching all species of marine wildlife in and around Scotland. It is expected that the Code will form the basis for more targeted codes and guidance material.

This Code was developed through extensive review and synthesis of existing guidance, and consultation with scientists, providers of tourism and wildlife watching opportunities, other marine and coastal user groups and the general public.



A Code of Conduct for Watching Marine Wildlife

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Introduction

Scotland has a long and varied coastline and a wealth of marine wildlife. This is arguably the best place in Europe to watch whales, dolphins and porpoises. The basking shark – the second largest fish in the world – can often be seen feeding off the west coast in summer. Seals are found all around our coasts; they can be curious and easy to observe. Otters are more elusive, but are nonetheless relatively common, and if you watch carefully and are patient you may see them. Spectacular populations of seabirds nest on our sea cliffs and islands, and hundreds of thousands of waders and waterfowl frequent our beaches and estuaries. Sea eagles can be seen soaring and hunting on our coasts. Occasionally loggerhead and leatherback turtles are seen in our waters.

Watching marine wildlife is exciting and memorable. It makes us more aware and increases our understanding and enjoyment of the marine environment. It is also increasingly important for tourism and the economy.

Some people now make their living taking visitors to sea, or on coastal walks, to watch wildlife. For others, watching wildlife is purely a hobby or part of a family outing. This Code is principally designed for those who actively watch marine wildlife around Scotland, but it is also relevant to other marine users who encounter marine wildlife during other activities. With this in mind, we all need to know how to act responsibly around wildlife.

The Code is not a law or regulation – its over-riding purpose is to raise awareness and offer practical guidance. It aims to:

- Help you to enjoy watching marine wildlife.
- Improve your chance of seeing wildlife.
- Help minimise disturbance to marine wildlife.
- Provide a standard for the wildlife watching industry.
- Help you to stay within the law.

For these reasons it is important that everyone follows the Code, as far as is safe, practical and feasible. Many species are protected by law and harming or disturbing them may be an offence, as explained in the section on the law in this document.

There are other excellent codes for watching marine wildlife, mostly targeted at particular users, species groups or locations. The Scottish Marine Wildlife Watching Code has been designed to complement these codes, and to help in

the development of new or improved targeted codes and guidance materials.

This document is intended to be a concise code of conduct. This comprises a set of broad Principles, followed by three user codes: **On the coast**, **On the sea**, and **In the sea**.

There is no separate code for those carrying out research: this guidance applies equally to everyone. If in doubt, you should contact **SNH** to discuss whether you need to apply for a licence to undertake an activity that would otherwise constitute an offence. Further information on marine wildlife and the law is provided in the final section.

This Code is complemented by the more detailed Guide to Best Practice for Watching Marine Wildlife (“the Guide”), arranged by major species groups: cetaceans (whales, dolphins and porpoises), basking sharks, seals, otters, birds and turtles. For each of these we provide basic information on the animals found at the coast and in the waters around Scotland, on their vulnerability to different forms of disturbance, on sensitive times and places, and more detailed guidance as to what constitutes responsible watching behaviour. We provide a guide to the law as it applies to each group. Users are reminded that the law protects wild plants as well as animals.

This Code deals mainly with minimising disturbance from individual encounters. There will inevitably be times and places where the number of encounters with wildlife increases to the point where the longer term well-being and survival of animals is compromised. The Guide therefore also includes a section which provides information on Dealing with cumulative impacts through the development of local wildlife management initiatives and improved marine planning.

A set of annexes to the Guide provides additional advice on what to do if you encounter injured or stranded animals, reporting and recording your sightings of marine wildlife, and a list of more specialist codes of conduct and guidance targeted at particular users or species groups.

The recommendations within the Code and Guide should be followed as far as possible, but remember that human safety is paramount and do not put yourself, or others, at risk.

Objectives of the Code

- To minimise the risk of harm to marine wildlife from encounters with people.
- To provide information about marine wildlife in Scotland, human activities most likely to affect animals and how to recognise the signs of disturbance.
- To offer specific guidance about watching marine wildlife with minimum disturbance.
- To provide an over-arching framework against which more detailed user codes or management measures may be developed to address specific local issues.





Principles

Be aware. Before you go wildlife watching, learn about the animals you might encounter. Understand how your actions could affect them. Be alert to the signs that animals make when they feel threatened. Be observant, patient and sensitive to the interests of the wildlife you are watching.

Take responsibility for your own actions. Constantly assess the wildlife's reaction to your presence and, if you see signs of disturbance, move away quietly. Consider how much time you spend watching animals. The presence of people over long periods can be disturbing, however careful you may be.

Have respect for other people, wildlife and the environment. Use your right of responsible access wisely. Respect the privacy and livelihoods of those who live by the sea. Leave the environment as you find it.





On the coast

Scotland's coast is a wonderful place to start exploring our enormously varied marine wildlife: from colonies of cliff-nesting seabirds, to seals that come ashore to rest and pup, to the miniature underwater worlds found in rockpools. You can get great views from the coast of whales, dolphins, porpoises and basking sharks, as well as of birds foraging or rafting on the water. Using binoculars from the coast means that you get better views, without having to be close to the animals.

You may also come across wildlife while taking part in other coastal activities, such as rock climbing, coastering and land yachting. You should follow this code regardless of whether you deliberately set out to see wildlife or are lucky enough to have an unexpected encounter.

- Follow any locally available advice about avoiding disturbance to wildlife. If you're visiting a wildlife viewing site then you may be asked to follow specific routes to minimise disturbance.
- Use wildlife watching hides wherever possible.
- Keep a good lookout and don't get too close. Use binoculars or a telescope to get better views.
- As soon as you see wildlife, assess the situation. What are the animals doing? Where are they going? How can I avoid disturbing them?

- Let the animals decide how close they want you to be. If you see signs of disturbance (such as “heads up” responses, alarm calls, sudden movements or aggressive behaviour) then you should move away and if possible take an alternative route or wait for the animals to move on.
- If you are passing close to wildlife, do so slowly and cautiously. Make sure that your movements are steady and predictable, and do not approach directly.
- Avoid surrounding or corralling the animals. If other people are watching the same animals, or you are in a group, try to ensure that you all stay together and to one side. Remember that with more people the likelihood of disturbance will be greater.
- Do not chase animals. Let them go if they move away.
- Do not feed or touch birds or other large wild animals.
- Avoid using flash photography – check the default setting on your camera.
- Move away from wildlife as quietly and carefully as you can – your exit should be as careful as your approach.
- Take extra care during sensitive times of year in places where animals may be feeding, resting, breeding or with their young:
 - Be careful not to scare birds off nests or trample burrows/nests.
 - Do not intentionally divide or put up flocks of birds or flush seals into the sea.
 - Do not approach otter holts (dens) closely, and avoid blocking routes to and from the sea.
 - Be careful not to split up groups or mothers and young, and never approach apparently lone young animals.





- Do not trample through rockpools. If you lift rocks, do so carefully and put them back the same way up and in the same place.
- If you touch or pick up small animals from rockpools, handle them with care and put them back where you found them.
- Avoid physical damage to the environment. Carry rather than drag canoes and dinghies where possible, and avoid trampling and erosion, particularly of sand dunes, saltmarsh and coastal grasslands.
- Keep your dog under close control at all times as they can cause great disturbance.
- Do not leave litter.
- If camping on the coast, follow the [Scottish Outdoor Access Code's](#) advice on camping responsibly. Avoid pitching your tent close to seal colonies, otter holts or sites used by birds for nesting or roosting.

See [A Guide to Best Practice for Watching Marine Wildlife](#) for more detailed advice on different species groups.



On the sea

Seeing wildlife is a great bonus to any boat trip, and increasing numbers of people are taking advantage of dedicated wildlife watching boat tours. There is a great deal of wildlife around, and it is often easy to see, even from a distance – especially if binoculars are used.

This guidance applies to anyone out in a boat of any kind who encounters wildlife, intentionally or otherwise. Although the Code should be followed at all times where practical, remember that the first responsibility of the skipper of a vessel is the safety of passengers and crew. Do not put yourself, crew or passengers in danger.

- Follow any locally available advice about avoiding disturbance to wildlife. This may include local marine codes, byelaws and wildlife management schemes.
- Keep a good lookout and don't get too close. Use binoculars to get a better view. Tour operators often provide their passengers with binoculars to assist with this.
- As soon as you see wildlife, assess the situation. What are the animals doing? Where are they going? How can I avoid disturbing them?
- If you are passing close to wildlife, reduce your speed to the safest minimum. Make sure that your movements are steady and predictable and approach at an oblique angle – direct or head-on approaches are more threatening. Depart with equal caution.





- Do not cut off an animal or group of animals by moving across their path, and do not approach them from behind.
- Let the animals decide how close they want you to be. If you see signs of disturbance (such as sudden movements or flight, aggressive behaviour, “heads up”, bunching together, tail slaps) then you should move away and if possible take an alternative route or wait for the animals to move on.
- If animals are moving in a consistent direction, maintain a steady parallel course and where possible keep above the recommended minimum distances discussed in the Guide.
- If marine mammals decide to approach you (for example to bow ride), try to maintain a steady speed and course. Try not to present your propellers to approaching animals.
- Make sure the animals are not surrounded. If other people are watching, try to stay on the same side. Avoid corralling or boxing animals in against the shoreline or in sea lochs or bays.
- If you can see one animal at the surface, others may well be nearby, just below the surface out of sight. Keep a careful lookout at all times.
- Remember that with more boats and people about, the likelihood of disturbance will be greater.
- Take extra care during sensitive times of year in places where animals may be feeding, resting, breeding or with their young:
 - Do not intentionally break up or put up rafts of birds or flush seals into the sea.
 - Avoid landing or entering the sea adjacent to designated seal haul-out sites.
 - Be careful not to split up groups, or mothers and young, and never approach apparently lone young animals.
 - Watch out for basking sharks at tidal fronts where different water bodies meet (often marked on the surface of the water by lines of debris or foam) as they may be feeding and not be aware of your presence.
- If watching whales, dolphins or porpoises, switch off your echo sounder if it is safe to do so. These animals are particularly sensitive to underwater noise and

it may interfere with their communication, navigation and foraging.

- Avoid using flash photography – check the default setting on your camera.
- Do not throw litter into the sea.

If you are using an engine:

- Avoid sudden unpredictable changes in speed, direction and engine noise.
- Keep your engine and propeller well maintained to minimise noise.

If you are under sail, paddling or rowing:

- Do not take advantage of your ability to approach quietly – it may result in wildlife being suddenly startled by your proximity.
- Be aware of any wildlife around your vessel so that you can act as quickly as possible to minimise disturbance.
- Remember that small craft are vulnerable. Getting too close to marine animals may put you at risk.
- If you are under sail, avoid tacking, gybing and flapping sails close to marine wildlife, if possible.
- When seals are hauled out on the shore, they are particularly prone to disturbance from passing kayaks. If paddling, give haul-out sites a wide berth.

Personal water craft (sometimes known as “jet skis”) are not recommended for viewing marine wildlife. They are fast, noisy, and low in the water. Their speed and limited range of visibility means that collisions may occur and can be serious for both parties.

- Keep a good lookout at all times, and keep away from marine wildlife where possible.
- If you have an unexpected encounter with marine wildlife, slow down and move away steadily to 100 metres or more.

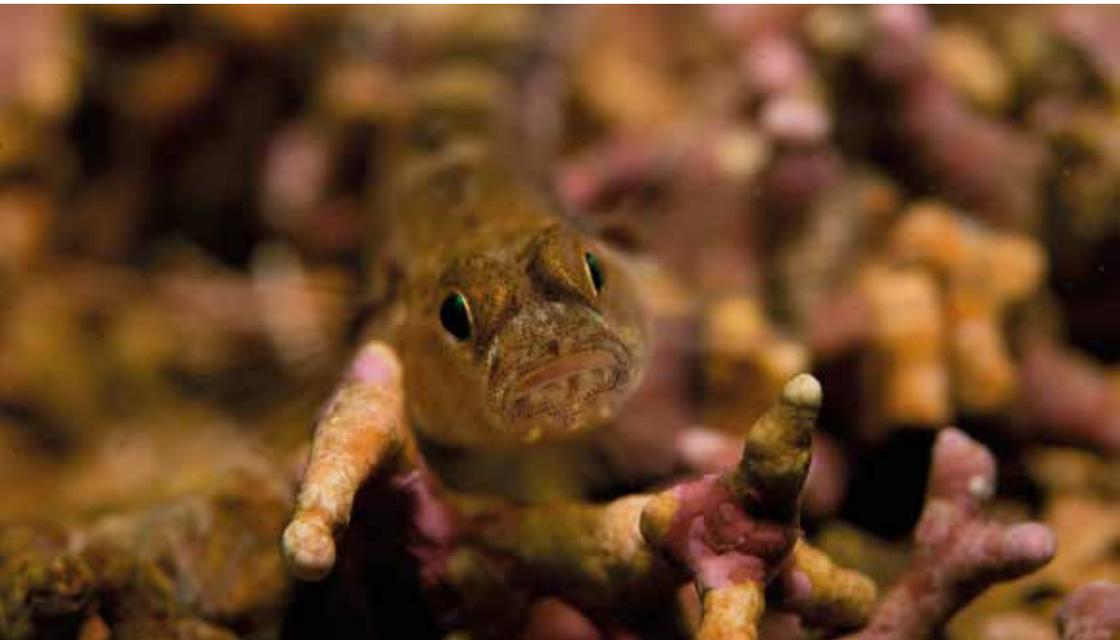
See **A Guide to Best Practice for Watching Marine Wildlife** for more detailed advice on different species groups.

In the sea

Diving, snorkelling and swimming in the waters around Scotland offer opportunities to see a stunning array of wildlife. High energy, wave-exposed coastlines with reefs and sea caves are a focus for many divers, with their varied communities of encrusting animals including sponges, anemones, sea mats and sea fans. A fascinating array of marine life can also be seen when snorkelling or swimming in more sheltered waters.

Divers can explore otherwise inaccessible places underwater. This offers great opportunities to see wildlife, but brings a particular responsibility to avoid disturbance. Most divers start out in a boat, and should therefore also observe the **On the sea** code at this stage of their trip.

- Follow any locally available advice about avoiding disturbance to wildlife. This may include local marine codes, byelaws and wildlife management schemes.
- Diving, snorkelling or swimming with marine mammals or basking sharks is not recommended. It can cause disturbance and stress to the animals as well as putting yourself at risk. However, if you do encounter animals while in the water, follow the guidance below where relevant, and take extreme care not to disturb the animals or put yourself in danger.
- Keep a good lookout on the surface and underwater.
- If you are passing close to marine wildlife, do so slowly and cautiously. Make sure that your movements are steady and predictable.



- Let the animals decide how close they want you to be. If you see signs of disturbance (such as sudden movements) then you should stop your approach or move away gently.
- Remember that the likelihood of disturbance will be greater with higher numbers of people (and boats) in the vicinity.
- If you touch or pick up small animals on the sea bed, handle them with care and put them back where you found them.
- Take care not to cause damage to the environment with your feet or fins. Be aware that some species are particularly sensitive to physical damage.
- Make sure that your buoyancy control is good and secure gauges, regulators, torches and other equipment to avoid damaging animals and plants attached to the sea bed or smothering them in clouds of sand or mud.
- Take pictures underwater only when you have become a competent diver and are able to control your buoyancy and your movements precisely. As you would normally use flash, limit the number of photographs of individual animals.
- Be aware that your trapped exhaust air can kill marine life in caves, caverns and wrecks. Minimise your time in such places.
- When night diving, be careful not to dazzle and disturb fish. Use the edge of the beam rather than pointing the torch directly at animals.

See **A Guide to Best Practice for Watching Marine Wildlife** for more detailed advice on different species groups.

The law

Protection of wildlife

Many forms of marine wildlife are protected by law. This Code does not attempt to explain it all but highlights the most relevant measures. You can find further information on wildlife and the law on the [SNH website](#).

For birds it is an offence to intentionally or recklessly kill, injure or take any wild bird, or take, damage, destroy, obstruct or interfere with any wild bird's nest whilst being built or in use, or their eggs. It is also illegal to possess any wild bird alive or dead, or part of one, or any egg.



Certain wild birds (those on Schedule 1 of the Wildlife and Countryside Act 1981(as amended)) are also protected from disturbance during breeding (whilst they are building or using their nest) or disturbance to their dependent young.

Nests habitually used by white-tailed eagle and golden eagle are protected at all times from intentional or reckless taking, damage, interference, etc. It is also an offence to intentionally or recklessly harass these birds.

For other animals it is an offence:

- To deliberately or recklessly disturb or harass any whale, dolphin, porpoise, marine turtle or otter, or intentionally or recklessly do so to a basking shark.
- To deliberately or recklessly capture, kill or injure any marine turtle, whale, dolphin, porpoise, or otter, or intentionally or recklessly kill, injure or take a basking shark.
- To damage or destroy a breeding site or resting place of any marine turtle, whale, dolphin, porpoise or otter.
- To deliberately or recklessly obstruct access to any structure or place used by an otter for shelter or protection.
- To possess, sell or offer for sale any marine turtle, whale, dolphin, porpoise, basking shark or otter or any part of these animals.
- To knowingly cause or permit any of the above offences.
- To intentionally or recklessly kill, injure or take any live seal at any time.
- To intentionally or recklessly harass seals at designated [haul-out sites](#).

[Marine European Protected Species Guidance](#) gives comprehensive advice for marine users who are planning to carry out an activity in the marine environment which has the potential to kill, injure or disturb a European protected species (EPS).

It is also an **offence** to uproot any wild plant unless this is accidental or permission has been given by the owner or occupier of the land. Further, it is illegal to intentionally or recklessly pick, uproot or destroy certain plants even with such permission.

The Partnership for Action Against Wildlife Crime Scotland ([PAW Scotland](#)) represents a wide range of bodies concerned with the prevention of crimes against wildlife.



Access to beaches and the foreshore

Rights of responsible access came into effect in 2005 under Part 1 of the Land Reform (Scotland) Act 2003 (as amended). **The Scottish Outdoor Access Code** sets out how these rights can be exercised and managed responsibly. Exercising access rights responsibly is about making informed decisions about what is reasonable to do in everyday situations. You need to be aware that, whilst you may only visit a place occasionally and feel that you cause no harm, the land manager and the environment may have to cope with the cumulative effects of many people. Acting with awareness and common sense underpins responsible behaviour.

Access rights to Scotland's beaches and coastline are very important as many people enjoy these places. For the public, access rights extend to beaches and the foreshore. Follow any local guidance, for example aimed at reducing dune or machair erosion or at avoiding disturbance of nesting birds. Public rights on the foreshore include fishing for sea fish, lighting fires, beachcombing, swimming, playing and picnicking.

Land managers can work with their local authority and other bodies to help facilitate and manage access. Local information, including signs indicating recommended routes and temporary (timed) restrictions on access, should always be agreed between land managers, representative bodies, conservation authorities and/or local access authorities. Under Section 29 of the 2003 Act, SNH may put up signs asking you to avoid a specific area or route in order to protect the natural heritage.

For further information about your access rights visit www.outdooraccess-scotland.com

What to do if you think an offence has been committed

If you witness or become aware of a wildlife crime being committed then you should do one of the following:

- If the incident is ongoing and there is a threat to health or property – contact Police Scotland on 999 or 112. Give details to the Service Centre Adviser. The nearest unit will attend the scene.
- If the incident is historical or is ongoing but does not pose a threat to health or property – contact Police Scotland on 101. Ask to speak to a Wildlife Crime Liaison Officer (WCLO). If a WCLO is not available, give details to the Service Centre Adviser. Record the incident number.
- If the incident involves an injured animal that is suffering – contact the Scottish SPCA on 03000 999 999.

The Partnership for Action Against Wildlife Crime (**PAW**) website provides more information on what to do if you think an offence has been committed, what to look for, and who to report to.

Scottish Natural Heritage

Scottish Natural Heritage (SNH) is a government body responsible to the Scottish Government and, through them, to the Scottish Parliament.

Our mission

All of nature for all of Scotland

Our aim

Scotland's natural heritage is a local, national and global asset. We promote its care and improvement, its responsible enjoyment, its greater understanding and appreciation and its sustainable use now and for future generations.

Our operating principles

We work in partnership, by co-operation, negotiation and consensus, where possible, with all relevant interests in Scotland: public, private and voluntary organisations, and individuals.

We operate in a devolved manner, delegating decision-making to the local level within the organisation to encourage and assist SNH to be accessible, sensitive and responsive to local needs and circumstances.

We operate in an open and accountable manner in all our activities.

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Scottish Natural Heritage
Dualchas Nàdair na h-Alba

All of nature for all of Scotland
Nàdar air fad airson Alba air fad



Construction Environmental Management Document

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14 Schedule of Mitigation

The Schedule of Mitigation for the Staffin Community Harbour development, as identified through the EIA process, is provided in Table 14.1 and Table 14.2. Table 14.1 outlines the mitigation required for the Community Harbour works, whilst Table 14.2 outlines the mitigation required for the works that will be undertaken at the Lealt Quarry.

The schedule of mitigation will be implemented, along with relevant best practice, as discussed in Section 2 of this document.



Table 14.1: Schedule of Mitigation for the Community Harbour Works

| No. | Topic | Aspect | Mitigation/Enhancement | Guidance | Source | CEMD Section Reference |
|-------|-----------------------------------|--------------------------------|--|--|----------------------------------|--------------------------|
| CH.01 | Air Quality | Dust | Dust suppression in line with PPG6 (e.g. sprinklers and water trucks) will be used in open areas and stockpiles as appropriate. Regular visual assessments of dust emissions will be made by site supervisory staff and remedial actions initiated as necessary. Regular maintenance will be undertaken on equipment. | PPG 6: Working at Construction and Demolition Sites. | Scoping Report Section 4.4.2. | Section 10.2. |
| CH.02 | Air Quality | Greenhouse Gas Emissions (GHG) | The intrinsic GHG cost of materials and associated transport to site, to be considered during procurement. | PPG 6: Working at Construction and Demolition Sites. | Scoping Report Section 4.4.2. | |
| CH.03 | Archaeology and Cultural Heritage | Archaeological Recording | A programme of Historic Building Recording must be undertaken on the boat nausts prior to their dismantling. A watching brief will be undertaken during their dismantling and groundworks in the immediate vicinity of the boat nausts. If significant archaeological remains are identified during the Watching Brief, excavation and post-excavation analyses can be undertaken where appropriate. | Offshore Renewables Protocol for Archaeological Discoveries (The Crown Estates). | EIAR Chapter 6, Section 6.6.1.1. | Section 8 & Appendix 8C. |
| CH.04 | Archaeology and Cultural Heritage | Marine Archaeological Finds | A protocol for archaeological discoveries (PAD) is to be included within the CEMD to ensure it is utilised in the event of a marine archaeological find. | Offshore Renewables Protocol for | EIAR Chapter 6, Section 6.6.1.1. | Section 8. |



| No. | Topic | Aspect | Mitigation/Enhancement | Guidance | Source | CEMD Section Reference |
|-------|---------------------|---------------------|--|---|-----------------------------------|------------------------|
| | | | | Archaeological Discoveries (The Crown Estates). | | |
| CH.05 | Marine Mammals | Disturbance | <p>Workers will be briefed to look for pinnipeds in the vicinity of the works, especially at the start of the day or after a break when they are most likely to be present.</p> <p>Activities will not start or will be stopped if individuals approach closer than 50m to the works. The works will cease until such a time that the individuals have moved further than 50m away.</p> | | EIAR Chapter 10, Section 10.6 | Section 13.2.3. |
| CH.06 | Terrestrial Ecology | Habitat Disturbance | <p>Plant will be precise when stripping vegetation within the construction footprint to minimise disturbance to the surrounding vegetation.</p> <p>Edges of remaining habitat will be sealed to prevent habitats drying out.</p> <p>If practical, curves from removed habitat within the footprint will be used to surface exposed edges.</p> <p>The vegetation temporarily removed during the laying of the water pipe feeding the harbour buildings will be reinstated as soon as practicable.</p> | | EIAR Chapter 11, Section 11.6.1 | Section 13.3.3. |
| CH.07 | Terrestrial Ecology | Otter | <p>Pre-construction otter survey will be carried out 6-8 weeks before construction commences. If a holt, layup or couch is found then an EPS licence may need to be sought.</p> | | EIAR Chapter 11, Section 11.6.3.1 | Section 13.4.3. |



| No. | Topic | Aspect | Mitigation/Enhancement | Guidance | Source | CEMD Section Reference |
|-------|------------------------------|---------------------------|--|----------|---|------------------------|
| | | | A Species Protection Plan will be developed for otters, taking into account the pre-construction otter survey findings. | | | |
| CH.08 | Terrestrial Ecology | Birds | <p>If construction is planned to commence during the breeding bird season (March – September), a breeding bird survey should be carried out at an appropriate point prior to construction commencing.</p> <p>Seasonal considerations will be given to nesting birds. Where practicable, ground clearance and movement of large piles of materials will be carried out, outwith the breeding bird season. However, where this is not practical, bird nest checks will be carried out regularly ahead of clearance/material movement works.</p> <p>A species protection plan will be produced for birds.</p> | | <p>EIAR Chapter 11, Section 11.6.3.1</p> <p>EIAR Chapter 11, Section 11.6.3.2</p> | Section 13.5.3. |
| CH.09 | Marine Ecology/Water Quality | Marine Non-Native Species | <p>Marine vessels will be sourced from within relevant biogeographic boundaries and will be compliant with the relevant requirements of the International Maritime Organisation, including adherence to the Ballast Water Management Convention.</p> <p>Salt water will be drained from all plant that could potentially transport water from the marine environment prior to being mobilized.</p> | | EIAR Chapter 17, Section 17.4.9. | Section 13.6.2. |



| No. | Topic | Aspect | Mitigation/Enhancement | Guidance | Source | CEMD Section Reference |
|-------|--------------------------------|---|---|----------|---|------------------------|
| | | | All materials used during the construction period will be free from marine organic matter and sourced from areas free from known MNNS. | | | |
| CH.10 | Soils, Geology & Palaeontology | Fossils | <p>An identification of where known fossils are present in the area will be included in the risk assessment for work being undertaken on site.</p> <p>Visual inspection for fossils to be undertaken prior to works commencing and the existing breakwater rock is removed.</p> <p>Appropriate construction site staff training will be provided to key employees (such as site supervisor) that includes awareness of fossil resources, and information on the Scottish Fossil Code.</p> <p>A Scottish Fossil Code Poster will be placed on the environment, health and safety boards in the welfare facilities make all construction workers aware of the fossil resources.</p> <p>If a fossil is found, the Scottish Fossil Code will be followed.</p> | | EIAR Chapter 12, Section 12.6.1.1 & 12.6.1.3. | Section 8.2. |
| CH.11 | Landscape, Seascape & Visual | Visual impacts | Maintaining a tidy site, appropriate storage of materials and consumables, considerate parking of plant and vehicles and maintenance of temporary elements, i.e., safety barriers, fencing, signage and lighting. | | EIAR Chapter 13, Section 13.6.1.1. | Section 7 & Section 9. |
| CH.12 | Traffic & Access | Access Road to proposed SCH development | Planned works on access road including passing place upgrades to be completed prior to construction works on the proposed SCH development commencing. | | EIAR Chapter 15, Section 15.6.1.1 | Section 12.3. |



| No. | Topic | Aspect | Mitigation/Enhancement | Guidance | Source | CEMD Section Reference |
|-------|------------------|---------------------------------|---|----------|--|------------------------|
| | | | | | Appendix O.1., in Volume 3 of the EIAR | |
| CH.13 | Traffic & Access | Road User Safety and Navigation | Construction Traffic Management Plan will be prepared and agreed with The Highland Council prior to works commencing. Daily road inspection and the public road to ensure it is kept clear of debris and mud. | | EIAR Chapter 15, Section 15.6.1.2 EIAR Chapter 15, Section 15.6.1.3 | Section 12.3. |
| CH.14 | Navigation | Construction Collision Risk | Local liaison officer in place. Appropriate Notice to Mariners provided prior to and during construction works. Temporary safe water markers (day and night) around the perimeters of the works. Inform users of works affecting navigation. | | EIAR Chapter 16, Section 16.6 | Section 12.3. |
| CH.15 | Navigation | Access to Slipway Reduced | Agree and communicate schedule of access to slipway. If practicable make new slipway available prior to concrete works on existing slipway. Local liaison officer in place. | | EIAR Chapter 16, Section 16.6 | Section 12.3 |



| No. | Topic | Aspect | Mitigation/Enhancement | Guidance | Source | CEMD Section Reference |
|-------|-----------------------------------|--|---|--|--|------------------------|
| CH.16 | Water Quality & Coastal Processes | Loss of Containment | <p>Compliance with CAR GBR28 for oils storage.</p> <p>Bio-degradable hydraulic fluids will be utilised in machinery where practicable.</p> <p>Adoption of appropriate spill prevention and response procedures.</p> <p>Appropriately bunded chemical storage cabinets will be provided on site. These will be kept locked, with the key under management control to ensure appropriate use and accountability.</p> <p>Refuelling will be carried out in designated areas by trained operatives following site refuelling procedures to be put in place aligned with GPP2.</p> <p>Plant and equipment will be appropriately maintained and operated.</p> <p>Compliance with the COSHH Regulations 2002.</p> <p>Sealing of shuttering and appropriate cement washout and treatment implemented in line with PPG6.</p> | <p>GPP2, Water</p> <p>The Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended).</p> <p>Control of Substances Hazardous to Health Regulations 2002.</p> | <p>EIAR Chapter 17, Section 17.6.1.1</p> | <p>Sections 9.3.</p> |
| CH.17 | Water Quality & Coastal Processes | Introduction of Invasive and Non-Native Marine Species | <p>All plant and equipment will be thoroughly cleaned prior to mobilisation to site.</p> | | <p>EIAR Chapter 17, Section 17.6.1.2</p> | <p>Section 13.7.2.</p> |



| No. | Topic | Aspect | Mitigation/Enhancement | Guidance | Source | CEMD Section Reference |
|-------|-----------------------------------|---------------------------|--|---|-----------------------------------|----------------------------|
| CH.18 | Water Quality & Coastal Processes | Litter | Waste receptacles will be covered, and littering will not be tolerated. | | EIAR Chapter 17, Section 17.6.1.3 | Section 7.5. |
| CH.19 | Natural Resource Usage and Waste | Materials and Water Usage | The re-use of materials will be preferred where practicable, to prevent additional materials from being required to be brought in off-site. In addition, where materials are required to be brought in from off-site, locally produced or sourced materials will be preferred. | Article 4 of the revised EU Waste Framework Directive (Directive 2008/98/EC) (rWFD) | Scoping Report, Section 12.4 | Section 7.3 & Section 7.6. |
| CH.20 | Natural Resource Usage and Waste | Waste | Waste will be required to be appropriately segregated and sentenced in line with the principles of the Waste Hierarchy. | Article 4 of the revised EU Waste Framework Directive (Directive 2008/98/EC) (rWFD) | Scoping Report, Section 12.4 | Section 7.3. |



Table 14.2: Schedule of Mitigation for works at the Borrow Pit.

| No. | Topic | Aspect | Mitigation/Enhancement | Guidance | Source | CEMD Section Reference |
|-------|---------------------------------|----------------------|--|----------------|---------------------------------|------------------------|
| CB.01 | Air Quality | Dust | A Site Dust Management Plan in line with PAN 50 Annex B Guidance must be developed and incorporated into the CEMD. | PAN 50 Annex B | EIAR Chapter 5, Section 5.7 | Section 10. |
| CB.02 | Air Quality | GHG Emissions | Plant and vehicles associated with the operational activities will be well maintained. | | Scoping Report Section 4.4.3 | |
| CB.03 | Air Quality | GHG Emissions | Stationery vehicles will be requested to switch off engines while waiting. | | Scoping Report Section 4.4.3 | |
| CB.04 | Archaeology & Cultural Heritage | Archaeological Finds | Disturbance of the areas in the immediate vicinity of the known non-designated assets (Sites 35, and 58 to 63) along the southern and eastern edges of the development need to be avoided as far as practicable. Where works are required in these areas, a Watching Brief may be required to identify any archaeological remains. If significant archaeological remains are identified during the Watching Brief, excavation and post-excavation analyses can be undertaken where appropriate. | | EIAR Chapter 6, Section 6.6.1.2 | Section 8.2. |
| CB.05 | Terrestrial Ecology | Habitats and Flora | Plant will be precise when stripping vegetation to minimise disturbance to surrounding vegetation. Edges of remaining habitat will be sealed to prevent habitats drying out. If practical, turves from removed habitat within the footprint will be used to surface exposed edges. | | EIAR Chapter 11, Section 11.6.1 | Section 13.3.3. |



| No. | Topic | Aspect | Mitigation/Enhancement | Guidance | Source | CEMD Section Reference |
|-------|--------------------------------|---------|---|----------|---|------------------------|
| CB.06 | Terrestrial Ecology | Otters | <p>Pre-construction otter survey will be carried out 6-8 weeks before construction commences. If a holt, layup or couch is found then an EPS licence may need to be sought.</p> <p>A Species Protection Plan will be developed for otters, taking into account the pre-construction otter survey findings.</p> | | EIAR Chapter 11, Section 11.6.3.1 | Section 13.4.3. |
| CB.07 | Terrestrial Ecology | Birds | <p>If construction will start during the breeding bird season (March – September). A breeding bird survey should be carried out at an appropriate point prior to construction commencing.</p> <p>Seasonal considerations will be given to nesting birds. Where practicable, ground clearance, movement of large piles of materials and blasting will be carried out, outwith the breeding bird season. However, where this is not practical, bird nest checks will be carried out regularly ahead of clearance/material movement works and blasting.</p> <p>A Species Protection Plan will be produced for birds.</p> | | <p>EIAR Chapter 11, Section 11.6.3.1</p> <p>EIAR Chapter 11, Section 11.6.3.2</p> | Section 13.5.3. |
| CB.08 | Soils, Geology & Palaeontology | Fossils | <p>Borrow pit work will not encroach on the Valtos SSSI.</p> <p>A visual inspection will be undertaken before work commences. Appropriate construction site staff training will be provided to key employees (such as site supervisor) that includes awareness of fossil resources, and information on the Scottish Fossil Code.</p> <p>A Scottish Fossil Code Poster will be placed on the environment, health and safety boards in the welfare facilities make all construction workers aware of the fossil resources.</p> | | EIAR Chapter 12, Section 12.6.1.2 & 12.6.1.3. | Appendix 8B. |



| No. | Topic | Aspect | Mitigation/Enhancement | Guidance | Source | CEMD Section Reference |
|-------|------------------------------|--|--|--|------------------------------------|------------------------|
| | | | If a fossil is found, the Scottish Fossil Code will be followed. | | | |
| CB.09 | Landscape, Seascape & Visual | Visual impacts | <p>Maintaining a tidy site, appropriate storage of materials and consumables, considerate parking of plant and vehicles and, maintenance of temporary elements, i.e., safety barriers, fencing, signage and lighting.</p> <p>Careful management of stockpiles to reduce perception of disturbance from the nearest residential receptors. This will require close liaison with the proposed SCH development main contractor.</p> | | EIAR Chapter 13, Section 13.6.1.2. | Section 7 & Section 9. |
| CB.10 | In-Air Noise and Vibration | Environmental Noise Nuisance from Borrow Pit Operations. | <p>Note this has been updated to take account of planning consent conditions.</p> <p>Operational hours restricted to 8.00am to 7.00pm Monday to Friday inclusive and 8.00am to 1.00pm on Saturdays.</p> <p>Broad spectrum white noise vehicle reversing alarms shall be fitted to all plant.</p> <p>All plant shall be properly maintained to ensure the integrity of silencers, lubrication of bearings etc.</p> <p>Site operatives appropriately trained to ensure compliance and to be noise vigilant at all times.</p> <p>Proposed noise limits:</p> <ul style="list-style-type: none"> During normal daytime working hours, temporary operations (including soil and overburden stripping, mound formation and removal, and final restoration), and for a total of no more than eight weeks in any calendar year, the free-field Equivalent Continuous Noise Level | PAN 50 Annex A Planning consent Reference No: 21/04525/FUL. | EIAR Chapter 14, Section 14.6 | Section 11.2. |



| No. | Topic | Aspect | Mitigation/Enhancement | Guidance | Source | CEMD Section Reference |
|-------|-----------------------------------|---------------------|--|--|---|------------------------|
| | | | <p>(LAeq, 1h) shall not exceed 70dB_{LAeq,1h} as recorded at any existing third-party noise sensitive properties.</p> <ul style="list-style-type: none"> During normal daytime working hours the free-field Equivalent Continuous Noise Level (LAeq, 1h) for the period of quarry operations shall not exceed a noise level of 45dB_{LAeq,1h} as recorded at any existing third-party noise sensitive properties. This will be achieved by ensuring that drilling and processing does not occur simultaneously during Phase 2. | | | |
| CB.11 | Water Quality & Coastal Processes | Loss of Containment | <p>Compliance with CAR GBR28 for oils storage.</p> <p>Bio-degradable hydraulic fluids will be utilised in machinery where practicable.</p> <p>Adoption of appropriate spill prevention and response procedures.</p> <p>Appropriately bunded chemical storage cabinets will be provided on site. These will be kept locked, with the key under management control to ensure appropriate use and accountability.</p> <p>Refuelling will be carried out in designated areas by trained operatives following site refuelling procedures to be put in place aligned with GPP2.</p> <p>Plant and equipment will be appropriately maintained and operated.</p> <p>Compliance with the COSHH Regulations 2002.</p> | <p>GPP2.</p> <p>The Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended).</p> <p>Control of Substances Hazardous to Health Regulations 2002.</p> | <p>Water</p> <p>EIAR Chapter 17, Section 17.6.1.1</p> | <p>Section 9.3.</p> |



| No. | Topic | Aspect | Mitigation/Enhancement | Guidance | Source | CEMD Section Reference |
|-------|-----------------------------------|-------------------------------------|---|--|-----------------------------------|------------------------|
| | | | Sealing of shuttering and appropriate cement washout and treatment implemented in line with PPG6. | | | |
| CB.12 | Water Quality & Coastal Processes | Surface Water and Overland Drainage | Surface water from the catchments surrounding the Borrow Pit will be prevented from entering the operational area by appropriate use of peripheral bunding and soil mounds. | | EIAR Chapter 17, Section 17.5.1.5 | Section 9.3.1 |
| CB.13 | Water Quality & Coastal Processes | Groundwater Management | <p>All aspects of groundwater management will be in accordance with current best practice techniques.</p> <p>All collected water (predominantly comprising incident rainfall and potential minor groundwater seepages) shall be directed to a sump and allowed to infiltrate through underlying strata. Water shall be used, as necessary, for dust suppression and operational processing.</p> | <p>Water Framework Directive (200/60/EC)</p> <p>Groundwater Directive (80/68/EEC)</p> <p>Groundwater Daughter Directive (2006/118/EC)</p> <p>Water Environment and Water Services (Scotland) Act 2003</p> <p>Water Environment (Controlled Activities) Regulations 2011.</p> | EIAR Chapter 17, Section 17.6.1.4 | Section 9A. |



14.1 References

- CIRIA. (2015). *The SuDS Manual*. Retrieved from Environment Agency, NIEA, & SEPA.
- (2012). *PPG 6: Work at Construction and Demolition Sites*. Retrieved from <http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/>.
- IAQM. (2014). *Guidance on the Assessment of Dust from Demolition and Construction*. Retrieved from http://iaqm.co.uk/wp-content/uploads/guidance/iaqm_guidance_report_draft1.4.pdf
- NIEA, S., Natural Resources Wales. (2017). GPP 21: Pollution Incident Response Plans
- Scottish Government. (2015). *Scotland's National Marine Plan: A Single Framework for Managing our Seas*. Retrieved from <https://www.nls.uk/scotgov/2015/9781785442148.pdf>.
- SEPA, NIEA, & Wales, N. R. (2017). *GPP2: Above Ground Oil Storage Tanks: Guidance on Pollution Prevention 2*. Retrieved from <http://www.netregs.org.uk/media/1475/gpp-2-pdf-jan-2018.pdf>
- SNH. (2017). *The Scottish Marine Wildlife Watching Code*.
- UNESCO. (2013). *Manual for Activities directed at Underwater Cultural Heritage: Guidelines to the Annex of the UNESCO 2001 Convention*.



Glossary

| Acronym | Definition |
|---------|---|
| ALARP | As Low as Reasonably Practicable |
| BAP | Biodiversity Action Plan |
| BGS | British Geological Survey |
| CAR | Controlled Activities Regulations |
| CD | Chart Datum |
| CEMD | Construction Environmental Management Document |
| CEMP | Construction Environmental Management Plan |
| CIfA | Chartered Institute for Archaeologists |
| COSHH | Control of Substances Hazardous to Health |
| CTMP | Construction Traffic Management Plan |
| DAL | Dalgliesh Associates Limited |
| DWP | Deep Water Port |
| ECoW | Ecological Clerk of Works |
| EIA | Environmental Impact Assessment |
| EIAR | Environmental Impact Assessment Report |
| EPS | European Protected Species |
| GBR | Generally Binding Rule |
| GCR | Geological Conservation Review |
| GPP | Guidance on Pollution Prevention |
| GWDE | Groundwater Dependent Terrestrial Ecosystems |
| HES | Historic Environment Scotland |
| IECoW | Independent Environmental Clerk of Works |
| INNS | Invasive Non-Native Species |
| JNCC | Joint Nature Conservation Committee |
| LOA | Length Overall |
| MCA | Maritime and Coastguard Agency |
| MEDIN | Marine Environment Data and Information Network |
| MHWS | Mean High Water Springs |
| MLWS | Mean Low Water Springs |
| MMO | Marine Mammal Observers |
| MNNS | Marine Non-Native Species |



| Acronym | Definition |
|---------|---|
| MPA | Marine Protected Area |
| MSNMP | Marine Safety and Navigational Management Plan |
| NCO | Nature Conservation Order |
| NCP | National Contingency Plan |
| NEC | New Engineering Contract |
| NLB | National Lighthouse Board |
| NRA | Navigational Risk Assessment |
| OASIS | Online AccesS to the Index of archaeological investigations |
| OSCP | Oil Spill Contingency Plan |
| PAD | Protocol for Archaeological Discovery |
| PAM | Passive Acoustic Monitoring |
| PAN | Planning Advice Note |
| PCSM | Principal Contractor Site Manager |
| PoR | Place of Refuge |
| PPG | Pollution Prevention Guidance |
| PPiP | Planning Permission in Principle |
| PPP | Pollution Prevention Plan |
| RAMS | Risk Assessment Method Statement |
| SAC | Special Area of Conservation |
| SCT | Staffin Community Trust |
| SCH | Staffin Community Harbour |
| SEARS | Scottish Environmental and Rural Services |
| SEPA | Scottish Environment Protection Agency |
| SM | Site Manager |
| SOLAS | Safety of life at Sea Convention |
| SoM | Schedule of Mitigation |
| SOSREP | Secretary of State's Representative for Maritime Salvage |
| SPA | Stornoway Port Authority |
| WCA | Wildlife and Countryside Act |
| WEWS | Water Environment and Water Services |
| WMP | Water Management Plan |
| WSI | Written Scheme of Investigation |



| Acronym | Definition |
|---------|------------|
| > | More than |