




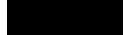
Mallaig Outer Harbour Improvements Splay Berth & Deepening



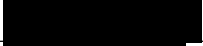


**MALLAIG
HARBOUR
AUTHORITY**

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	Name	Title	Signature	Date
Author	Kirsty Macdonald	Senior Environmental Consultant		06/05/2021
Reviewer	Fiona Henderson	Managing Director		06/05/2021
Authoriser	Innes Beaton	Director		06/05/2021

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1 Introduction

Mallaig Harbour Authority (MHA) are proposing to construct a new splay berth and deepen the waters within the Outer Harbour area of Mallaig Harbour. The development, including the deepening, will cover a total area of 33,000m² and will provide additional berthing space, operational quayside, and laydown space, primarily for the fishing and aquaculture sectors. The harbour improvements will accommodate an increased number of vessels and the dredge will allow for deeper draughted vessels, including well boats, to enter the Outer Harbour in all tide states.

The development of Mallaig Harbour began in 1846, prior to EIA regulations, however, if the harbour were to be built today, it would fall under Section 8(2) of Schedule 1 of the Marine Works (Environmental Impact Assessment (EIA)) (Scotland) Regulations 2017. It is considered that the proposed development is an extension to a Schedule 1 development, and as such, falls under item 14 in the table provided in Schedule 2. Hence, a formal Screening Opinion is therefore requested from Marine Scotland under regulation 10(1) of the aforementioned legislation to determine whether an EIA will be required to support the Marine Construction and Dredge Licence applications for the proposed development. It is noted that vessels in excess of 1,350tonnes will not be able to utilise the new splay berth, hence the project does not fall under Schedule 1 Section 8 and hence require an EIA in its own right. Vessels in excess of 1,350tonnes can already utilise the outer breakwater quay in the Outer Harbour.

This report provides the information requested under Section 10 of the EIA Regulations, in order to inform the corresponding screening opinion, namely a description of:

- The location of the proposed works;
- The proposed works;
- The environmental sensitivities of the geographical area;
- The aspects of the environment likely to be significantly affected by the proposed works;
- The likely significant effects; and
- The features of the proposed works or proposed measures envisaged to avoid or prevent significant adverse effects on the environment.

2 Location

Mallaig is a port situated on the west coast of Scotland in the region of Lochaber (Drawing 69.01.02). The town is situated approximately 42 miles from Fort William at the end of the A830, also known as the Road to the Isles. Mallaig harbour (National Grid Reference: NM 67585 97217) is a working fishing port and there are ferries from here to the Inner and Outer Hebrides, the Small Isles, and the Knoydart Peninsula.

Mallaig falls within the Lochaber area of The Highland Council (THC). The harbour is managed by the MHA and the Harbour Limits encompass the whole of the Harbour basin and approach channel. These extend south and west from the Harbour mouth in an arc towards the small island of Eilean na h-Acairseid and north across the mouth of Loch Nevis to the headland of An Faochag on Knoydart, with a southern limit within Loch Nevis itself at approximately 4km south of the village of Inverie.

The area of the proposed development is known as the Outer Harbour and is shown in Drawing MOHI-WS2175-XX-00-DR-C-9105 P02. The area proposed for development is indicated by the red line boundary.

3 Background and Need

3.1 History

The original pier in Mallaig was built in 1846 with the road extended to the pier in 1879 and salt and barrel stores built in 1883. With the coming of the railway in 1901, Mallaig Harbour developed into the premier fishing port on the west coast of Scotland, supporting the valuable herring industry. In more recent years, the harbour has been expanded and upgraded to accommodate Roll-on, Roll-off (RoRo) ferries, meet the modern requirements of the fishing and aquaculture sectors and to encourage leisure users. Recent improvements have included prevention of corrosion of steel piled quays by cathodic protection, re-fendering of the Fish Pier, provision of a passenger ferry access pontoon, a large area of resurfacing on the road to the Outer Breakwater, resurfacing of a large area of the Steamer (ferry) pier, and provision of secure car parking areas. In 2011, a 1200 tonne storage building and a 50-berth marina for leisure craft were also established at the port.

The MHA was formed via The Mallaig Harbour Revision Order 1968. The MHA made an application for a harbour revision in 2011 and now operate under The Mallaig Harbour Revision Order 2012 which enables the Authority to carry out its business under the Modernisation of Trust Ports Legislation. The MHA is legally responsible for the management and operation of the harbour and its ongoing development.

3.2 Current Use

Mallaig is a working harbour with multiple users including the fishing industry, ferry services, aquaculture industry and users of the recreational marina.

The aquaculture industry utilises Mallaig Harbour for fish feed storage and distribution and Mallaig is a key hub for this sector. The harbour is an important site for storage, landing, processing, and packaging of fish and crustaceans for transport and is the leading port on the west coast of Scotland for prawn (*Nephrops*) landings.

A salmon harvesting station within the Outer Harbour area is operated by MOWI. Salmon are transported by sea to the harvest station in Mallaig harbour before being shipped onwards to MOWI's processing plant in Fort William. The fish are discharged from well boats moored on the Outer Breakwater Quay to the harvesting station through a pipeline which runs from the Outer Breakwater Berth along the edge of the quay to the harvest station. MOWI also use the Harbour to service offshore sites on the islands of Muck and Rum.

Scottish Sea Farms Limited also use Mallaig Harbour as an operational base for their sites in Loch Nevis. The Scottish Salmon Company use the harbour as a back-up location for unloading harvested salmon. Ferguson Transport & Shipping also have an operating base in the harbour.

Regular ferry services, operated by Caledonian MacBrayne Ferries Ltd (CalMac), operate from the steamer pier in Mallaig Harbour. These provide year-round links from Mallaig with the Isle of Skye, South Uist and the Small Isles. A passenger ferry operates from the Passenger Access

Pontoon at the inshore end of the Fish Pier, providing transport to and from the remote Knoydart Peninsula via Loch Nevis. A freight only service transports bulk, loose cargoes and heavy plant to the Small Isles and Knoydart Peninsula. A number of vessels also operate as marine related tourism businesses from Mallaig Harbour Passenger Pontoon and from the Inner Harbour Marina.

The Outer Harbour basin was constructed in 1996-98 with a depth of -4m Chart Datum (CD) and has three quays for berthing (Outer Breakwater Quay, Ice Quay and Feed Berth Quay). The Outer Breakwater Quay can accommodate vessels in excess of 1350 tonnes and up to a maximum length of around 80 metres when tidal conditions allow. The Ice Quay provides berthing mainly for fishing vessels and small aquaculture service vessels all under 1350 tonnes, and access for ice from a containerised Plant at the northern end of the quay. The Feed Berth is located on the inshore end of the north face of the Steamer Pier and provides berthing of vessels of up to around 1000 tonnes collecting fish feed from the adjacent feed store building.

The area between the ice quay and outer breakwater quay, labelled the "slot," see Figures 1 and 2 below, was left undeveloped in the 1996-98 development, is currently not in use and is unsuitable for berthing due to a lack of any quay faces and the presence of shallow bed rock which is exposed at low tide. This area is approximately 65m in width and 50m in length.



Figure 1: Overview of Mallaig Harbour



Figure 2: The Slot

3.3 Need

The need for the development is primarily to ease peak congestion in the Harbour by providing additional berthing for fishing and aquaculture related vessels. The increase in berthing space provision will also offer opportunity for increased use of the basin by other vessels at off-peak times, all yielding additional turnover for the Harbour. The MHA's current Masterplan details proposals for improving wave climate in the Outer Harbour along with freeing up berth and quayside space due to the high demand for berthing and refuge within the harbour basin, particularly during bad weather when fishing and other vessels seek shelter.

To meet the demand for berthing within the harbour, additional berthing quay length is required. The only area of the harbour that has the potential for development without impairing other activities is the "slot." This area was aside in 1996 as a potential site for a boatyard however, this plan never came to fruition and the area has remained undeveloped. By utilising this space and building the Outer Harbour Splay Berth, additional berthing can be provided.

A second driver for the development is the Harbour Authority's urgent requirement for more operating space with quay access. The space is required to meet the needs of commercial fishing and aquaculture related activities, particularly for the loading and unloading of fish and fish feed, and to offer some limited opportunity for onshore expansion in a harbour which is severely limited by lack of shoreside development area. By building the Outer Harbour Splay Berth and the reclamation behind it, additional laydown space will be created to support expanded quayside operations and offer the potential for future harbour development.

The Harbour Order for the creation of the Outer Harbour Development of 1996-98 allowed for dredging of the basin and its approaches to a depth of 6 metres below Chart Datum. However, when the Outer Harbour came to be constructed it was only dredged to a depth of -4m CD, to suit budget limitations at that time, but the design of the Works allowed for a future dredging to a depth of -6m CD at a later date. The outer basin has operated with the restricted depth of -4m CD to date, but over the last ten years or so there has been increased demand to accommodate deeper draughted vessels. The current depth of the basin has meant that any vessel with a draught greater than 4m is only able to use the harbour on a tidally restricted basis, arriving after one low water and leaving before the next, to avoid grounding. With small cargo, fish farm well boat, support boat and trawler draughts generally increasing, the "tidal curfew" on larger vessels using the Outer Harbour increasingly limits MHA's ability to offer facilities to the range of vessels wishing to use their Port. There has been a particularly severe impact from limited depth on use of the harbour by fish farm well boats (normal draught of 5m plus) which typically seek to discharge at Mallaig on a daily basis. These vessels are forced to plan their arrivals and departures around tides which change by approximately one hour every day, rather than working to a schedule to suit normal staffing and shift working at the Mallaig harvest station. Proposals within the current Harbour Masterplan include deepening of the Outer Harbour to allow access for deeper draughted vessels generally, to improve the Harbour's offer to all potential Harbour users, and thereby to improve its commercial resilience and profitability.

In particular it is anticipated that the proposed increase in basin depth to -6m CD will not only ease the tidal curfew issues experienced by fish farm well boats but will also increase the potential for use of the harbour by small cargo vessels and larger trawlers.

The MHA recognises its important role in generating direct and indirect employment within the town of Mallaig and the local area. Employment in Mallaig has a high dependency on tourism with many local jobs within the hospitality industry. The outbreak of the coronavirus, COVID-19, resulted in a national lockdown during 2020 with limited international travel during the peak tourist season. The ongoing restrictions, local lockdowns and uncertainty surrounding the virus have had a heavy impact on the local economy and employment due to its reliance on the tourism industry. MHA see the development of the Splay Berth area as offering improved opportunity for preservation and expansion of local jobs which are independent of the tourist industry, improving the variety of local employment opportunities. Employment within Mallaig is discussed further in Section 5.5 People.

4 Characteristics of Development

The Mallaig Outer Harbour Splay Berth will provide additional berthing length of approximately 60m and additional quayside operational and laydown space of over 4000m², see Drawing MOHI-WS2175-XX-00-DR-C-9104 P02. The Outer Harbour will also be deepened to -6m CD to accommodate deeper drafted vessels.

In addition, to the development of the Outer Harbour Splay Berth and associated dredging, discussed in Sections 4.1.1 and 4.1.2, other works related to, and which will support the aims of the development in creating additional operating space, are discussed in Section 4.1.3. These activities will not involve works below Mean High Water Springs (MHWS) and as such are not subject to Marine Licensing.

4.1 Development Description

4.1.1 Outer Harbour Splay Berth

The works to form the proposed Mallaig Outer Harbour Splay Berth will be located in the undeveloped area at the north-west corner of the Outer Harbour basin and between the Ice Quay and the Outer Breakwater Quay in the area referred to hereafter as the slot (see Drawing MOHI-WS2175-XX-00-DR-C-9104 P02).

As noted previously the slot was originally designated for development as a boat yard but this was never built. It is therefore proposed that this area should be utilised to increase berthing space and laydown area for current and future harbour users.

The "slot" will be infilled using dredge material (blasted rock, plus sand and gravel) to create a hard standing area as discussed in Section 4.2.2. The quay will be a suspended reinforced concrete deck on tubular steel piles which will join onto the Ice Quay at one end and the Outer Breakwater Quay at the other end and back onto the reclaimed area of the slot. A rock armour slope on the seaward end of the land reclamation, under the quay, will help to dissipate wave energy in the Outer Harbour. The suspended deck and land reclamation will be at a height of +7.43m CD. An additional rock armour revetment is proposed to be installed on the outside edge of the Stub Breakwater to further manage wave energy by reducing the transmission of northerly waves into the Outer Harbour.

Quay furniture including fenders, ladders and bollards will be provided. Services will also be required including operational lighting for the quay and reclaimed area which will need to be installed for safety and security reasons and potentially power supplies and drainage.

The fish harvesting pipeline will be rerouted, if required, to facilitate construction and avoid operational clashes.

4.1.2 Deepening of Outer Harbour

Dredging of approximately 85% of the footprint of the Outer Harbour basin, plus the entrance, will be carried out to increase the depth from the current level, typically between -4m and -5m CD, to a new level of -6m CD, see Drawing MOHI-WS2175-XX-00-DR-C-9105 P02. The dredge volume is made up of approximately 18,500m³ (37,000t) of overburden and approximately 10,000m³ (27,000t) of bedrock in situ.

The area was dredged during the harbour build in 1995 with around a third of the area of the basin requiring blasting to remove bedrock. The overburden for the dredge proposed comprises of sand and shattered rock fragments, up to cobble size, left from the previous dredge.

It is acknowledged that a Best Practice Environmental Option (BPEO) assessment will be required to determine the use/disposal route for this material to support the dredge licence application. Grab sampling of overburden sand/silt will be carried out to understand the chemical characteristics. It is noted that it will not be possible to sample/analyses the bedrock or shattered larger rock fragments which make up a significant proportion of the dredge material.

4.1.3 Other Works

Other works proposed in the area of the Splay Berth are expected to include permanent surfacing of the area between the ice plant and feed store building providing additional space suitable for quayside operations.

4.2 Construction

4.2.1 Outer Harbour Splay Berth

Initial works will comprise the removal of the existing revetment rock armour, which will be stored onshore within the harbour area for reuse, at the seaward end of the slot. Rock fill, primarily from selected dredged material, but supplemented where necessary by imported fill, will be placed, and compacted to infill the inner end of the slot and bring it above high tide level.

Between the north end corner of the ice quay and the western end corner of the outer breakwater quay, a concrete beam will be constructed on the seabed (rockhead), to act as a support to the toe of the proposed rock armoured revetment. Sockets will be cast within the beam to hold the toes of front row of tubular steel bearing piles which support the front edge of the proposed splay berth deck slab. The slot will be reclaimed by infilling the area with compacted suitable dredged material (sand, gravel, and rock) with the outer face being trimmed by an excavator to produce a sloping revetment ready to receive rock armour. The tubular steel bearing piles that will support the deck slab will be installed through the reclamation fill until they reach the (currently exposed) rockhead surface below and will then be driven for a short period to ensure full bearing capacity on rock is achieved. The tubular bearing piles that support the front edge of the quay slab will then be placed into the sockets in the concrete toe beam, supported by temporary steel bracing (above MHWS) and driven for a short period to ensure full bearing capacity on rock is achieved.

As described above, piling techniques will include pile placement into sockets (front of quay piles), vibro installation through fill (all other piles) and percussive piling to prove bearing for short periods estimated at between 5 to 15 minutes per pile. Between 60 and 65 tubular steel piles of 600 to 700mm diameter are expected to be installed to support the quay slab. As pile installation proceeds drilling into rock of grouted steel anchors or toe pins within some of the piles will be carried out, where required by the design, to resist lateral or uplift forces by securing the pile toes to the rockhead.

Following completion of piling, rock armour will be placed by land-based crane & grab or long reach backhoe to cover the outer face of the reclamation revetment, reusing the existing armour previously removed and stored, supplemented with additional import if required. A suspended reinforced concrete slab will be installed on top of the tubular piles to complete the Splay Berth quay deck. The area of concrete quay deck constructed over rock armoured revetment is expected to total 1310m². Wave modelling has confirmed that the finished construction of open piled deck over rock armoured revetment will maintain wave energy dissipation at this corner of the harbour basin at a similar level to the existing arrangement of the slot with an intertidal rocky shore and a small armour revetment at its inshore end.

Services tunnels will be constructed in the filled area behind the quay deck, quay furnishings such as bollards and fendering will be installed, and the reclamation area fill will be surfaced

with crushed stone (Type 1), concrete or asphalt, as required, to provide a permanent surface for access, laydown, or future development behind the new quay.

4.2.2 Deepening of Outer Harbour

As described in the introduction to this section, it is proposed to deepen a substantial portion of the Outer Harbour basin and its approaches to a depth of 6m below Chart Datum. This will be achieved by dredging of overburden and rock. The area of bedrock which requires dredging is situated entirely within the confines of the harbour basin and will require drilling and blasting prior to its removal.

Pre-split drill and blast techniques will be used to form the edges of the dredge in advance of bulk blasting of bedrock close to existing quay walls, to prevent as far as possible any undercutting of structures and to limit transmission of vibration to those structures. Drilling and blasting are expected to be carried out from floating or jack-up plant. Drilling and blasting of the armour toe trench and concrete toe beam may also be carried out from marine plant or, could be carried out from a temporary bund of dredged or rock fill material deposited locally in the harbour basin. This would then be removed following the completion of blasting.

Dredging is expected to be carried out by backhoe or grab dredger working from floating plant, and by long reach excavator working from shore, temporary bund, or quayside.

As previously noted, it is proposed that the bulk of the dredge material will be used in infill works. The remainder is being considered for any local developments in the area at the time of the works and for disposal at the closest dredge disposal site, HE070 (57.05856°N, - 5.89101°E), located off Armadale on the Isle of Skye, subject to the findings of the BPEO assessment which will accompany the marine licence application for the Dredging and Disposal works.

4.2.3 Other Works

Surfacing works to the reclaimed area behind the new quay deck will be carried out using imported crushed rock, asphalt, and reinforced concrete ground slabs.

4.3 Operation

It is anticipated that the development will be utilised primarily by fishing and aquaculture work boats of up to a few hundred tonnes and the additional operational quayside space and laydown will be used primarily by aquaculture and marine services operators and suppliers.

4.4 Demolition/Reinstatement

There are no plans to discontinue the use of this site in the future, therefore, it is not considered necessary to plan for demolition or reinstatement works for its closure.

5 Known Sensitivities

5.1 Biodiversity

5.1.1 Designated Sites

Table 5.1 details the Statutory Nature Conservation Designated Sites; Marine Protected Area (MPA), Special Scientific Interest (SSSI), Special Area of Conservation (SAC), and Special Protection Area (SPA), within approximately 10km of the proposed development. Locations of designated sites identified within the vicinity of the site are shown in Drawing 69.01.01. Sites unlikely to be affected by the development due to their location and/or associated designated features (e.g., Terrestrial biological features that will not interface with the site), are shown in grey. Due to the nature of the works being predominantly in the marine environment, marine specific designations have the potential to be affected and are described in more detail in subsequent sub-sections.

Table 5.1 Designated Sites within 10km

Site	Designation	Distance & Direction	Designated Features (relevant designation)	Comments
Inner Hebrides and Minches	SAC	180m West	Annex II species: Harbour porpoise (<i>Phocoena phocoena</i>).	Included in screening – Due to proximity of works and mobile species.
Blar na Caillich Buidhe	SSSI	5.1km South	Blanket bog, Lichen assemblage and Upland Oak Woodland.	Not considered further – Due to distance from works and immobile species.
Loch Morar	SSSI	4.3km SSE	Native pinewood and Oligotrophic loch.	Not considered further – Due to distance from works and immobile species.
Aird Thuirinis – Port na Long	SSSI	8.6km NWW	Moine.	Not considered further – Due to distance from works and immobile species.
Sea of the Hebrides	MPA(NC)	10.5km WSW	Basking shark (<i>Cetorhinus maximus</i>), Minke whale (<i>Balaenoptera acutorostrata</i>), Fronts and Marine Geomorphology of the Scottish Shelf Seabed.	Included in screening – Due to basking shark and minke whale being mobile species extending a 10km range.
Coille Delavil	SSSI	11km NW	Blanket bog, Dragonfly assemblage, Flood-plain fen, and Lichen assemblage.	Not considered further – Due to distance from works and limited species range.

5.1.2 Marine

Important marine receptors are present within the vicinity of Mallaig Harbour with designations in place. The Sea of the Hebrides MPA is designated for basking shark (*Cetorhinus maximus*) and minke whale (*Balaenoptera acutorostrata*). At its closest point, the site is approximately 10.5km away from the boundary of the MPA. Both these species ranges extend further than 10.5km and they are also afforded protection when outwith the MPA.

Basking sharks are considered a vulnerable species and are afforded full protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). They are also a priority marine feature in Scotland's seas. Minke whales are common in Scottish waters during the summer months, often spotted feeding close to shore. They are a European Protected Species (EPS) and afforded protection under the Habitats Regulations 1994. Records of basking shark and minke whale around the Mallaig Harbour area have been identified from the National Biodiversity Network (NBN) Atlas (National Biodiversity Network Atlas, 2020).

The Inner Hebrides and Minches SAC is situated adjacent to Mallaig Harbour with the boundary of the SAC approximately 180m to the west. The SAC is designated for Harbour Porpoise (*Phocoena phocoena*) which are also afforded protection when out with the SAC. The SAC is a Natura site and as such, it falls under the Habitats Regulations, hence an appraisal will need to be undertaken by the competent authority (Marine Scotland) to identify if an appropriate assessment is required. Records of harbour porpoise have also been identified in the area from the NBN Atlas (NBN Atlas, 2020). Like the minke whale, harbour porpoise are also listed as an EPS and afforded protection under the Habitats Regulations 1994. The Armadale disposal ground, HE070, sits within the Inner Hebrides and Minches SAC.

Records of common dolphin (*Delphinus delphis*), bottlenose dolphin (*Tursiops truncatus*), harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*) have also been identified within the area close to Mallaig Harbour (NBN Atlas, 2020). Records of grey seals have been identified within the harbour area itself. Anecdotal reports have also confirmed the presence of a grey seal frequenting the inner harbour area (Communication with Wallace Stone, 2020). Grey seals are afforded protection under the Marine (Scotland) Act 2010.

A search for benthic receptors was carried out within the Mallaig Harbour area using the National Marine Planning Interactive (Marine Scotland, 2020). No protected features were identified. As previously noted, the harbour was dredged in the past and blasting was carried out to break up the bedrock. In addition to bedrock, overburden of sand and rock fragments are present. This substrate, along with the area being a long running working harbour is therefore unlikely to provide high quality habitat for benthic ecology or provide spawning or nursery grounds for fish. There are also no major rivers within the Mallaig Harbour area and therefore it is unlikely any migratory fish species will be affected.

5.1.3 Terrestrial

As detailed in Table 5.1, SSSI designations within the vicinity of the site will not be considered further due to a lack of connectivity with the site.

A search of the NBN Atlas (NBN Atlas, 2020) identified 19 mammal species within 5km of the development. For the majority of the species identified there is a lack of connectivity to their natural habitats as the development is within a busy working harbour on the edge of the town.

A record of a European Otter (*Lutra lutra*) was identified close to the harbour area and two further records are shown further in land nearby. Otter use both coastal and riverine habitats and could therefore utilise the harbour area. It should be noted that these records are over 10 years old. The Masterplan for Mallaig Harbour (January, 2017), however, notes the presence of otters around the harbour area.

The Outer Harbour does provide suitable habitat for otter. Rock armour on the outer breakwater could provide shelter however, this is very exposed. Otter are likely to utilise the

harbour primarily for foraging and feeding. Otters are listed as an EPS and are protected under the Habitats Regulations 1994.

5.1.4 Ornithology

As shown in Table 5.1, there are no designated sites near the development of which has birds as a qualifying feature.

A total of 163 species of bird have been recorded within a 5km radius of Mallaig Harbour (National Biodiversity Network Atlas, 2020). Of the 163 species identified, there are 7 species which are afforded protection under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended); Kingfisher (*Alcedo atthis*), Brambling (*Fringilla montifringilla*), Black Throated Diver (*Gavia arctica*), Great Northern Diver (*Gavia immer*), Red Throated Diver (*Gavia stellata*), Hen Harrier (*Circus cyaneus*), Snow Bunting (*Plectrophenax nivalis*), Slavonian Grebe (*Podiceps auritus*) and the White Tailed Eagle (*Haliaeetus albicilla*).

Numerous records of manx shearwaters (*Puffinus puffinus*) exist around Mallaig Harbour and the surrounding area. Manx shearwaters are classified as Amber under the Birds of Conservation Concern 4: the Red List for Birds 2015. Manx shearwaters breed in large numbers on the Isle of Rum, west of Mallaig, and fledge between late August and early October departing their nest sites and migrating as far as South America. Local reports and a recent study note that these fledglings can become 'grounded' in the Mallaig area. Grounded refers to birds crash landing in cities and towns close to their nest sites. Shearwaters, along with storm petrels, are nocturnal species and can be attracted to artificial light. Sypozs *et al* noted that increased grounding tended to occur during times of high inshore winds blowing the birds off course and on moonless nights where artificial light would stand out more (Sypozs *et al*, 2018; Oban Times, 2019). A local initiative is in place which recovers stranded birds from the area and releases them back at sea if appropriate. The Masterplan for Mallaig Harbour notes the presence of manx shearwaters in the harbour area.

All bird species are afforded protection during the breeding bird season under the Wildlife and Countryside Act 1981 (as amended). Some gull species are known to utilise harbour areas during the breeding bird season although no records have shown this at Mallaig Harbour. The area of the proposed development is not considered an important breeding site for the Schedule 1 species listed above due to the lack of available habitat and high levels of disturbance which comes with a working port and town.

5.2 Cultural Heritage

There are 23 Canmore and 10 Canmore maritime entries (Historic Environment Scotland, 2020) within a 1km radius of the proposed development site. No wrecks have been identified within the footprint of the development area. Outwith the harbour area, four wrecks have been identified. Given the nature in which they came to grief (grounding\stranding), it is likely that all of these vessels are no longer in situ, however, they are detailed in the Table 5.2 below and illustrated on Drawing 69.01.03.

There also 6 listed buildings within 1km of the site which are also detailed in Table 5.2 and illustrated on Drawing 69.01.04.

Table 5.2 Details of Listed Buildings and Canmore Interests within 1km of the Development Site

Site/Description	Index No. Primary Reference	Designation /Status	Location (OS NGR)	Mapped Point
Commemorative Monument, Mallaig Harbor Memorial to Those Lost at Sea, on Steamer Pier, Mallaig Harbour	Canmore 333486	Historic Environment Record	NM 67633 97133	-
Harbour and Pier, Mallaig Harbour Mallaig Harbour completed 1901 by the West Highland Extension Rly. The original concrete steamer pier and fishing Harbour has recently been extended by sheet piling, with the formation of a second pier (1977). There are five fish-curing sheds of various dates, with the typical adjustable wooden roof ventilators.	Canmore 108367	Historic Environment Record	NM 67742 97150	-
Statue, Mallaig Harbour Fisherman, Child, and Anchor, on Steamer Pier, Mallaig Harbour	Canmore 333485	Historic Environment Record	NM 67852 97244	-
Beacon, Sgeir Dearg, Mallaig Harbour Period Unassigned	Canmore 293230	Historic Environment Record	NM 67766 97544	-
Canmore Maritime, Sgeir Dearg, Mallaig Harbour (Classified as steel steam drifter, in ballast; registration number cited as BF 1396, and date of loss cited as 4 October 1914). Wallflower: this vessel stranded on Red Rocks, Mallaig. Capt. Slater.	CAS 213154	Historic Environment Record	NM 67701 97500	1
Canmore Maritime, Sgeir Dearg, Mallaig Harbor (Classified as steam drifter: date of loss cited as 4 August 1931). Ocean Retriever II: this vessel was wrecked on beacon rock [Beacon Rock], [at the] entrance to Mallaig Harbour. Harbour reports remains of two boilers noted still present in last few years, partially visible on an extreme low tide.	CAS 293427	Historic Environment Record	NM 67701 97500	2

Site/Description	Index No. Primary Reference	Designation /Status	Location (OS NGR)	Mapped Point
Wreck, Sgeir Dearg, Mallaig Harbour (Classified as Pleasure [Fishing] [Vessel]: date of loss cited as 19 July 1978). Peggy: this vessel stranded on Sgeir Dhearg. Likely all gone Harbour reports this vessel was recovered & repaired in Mallaig Boatyard	WRK 293229	Historic Environment Record	NM 66796 97469	3
Wreck, Mallaig [Fishing] [Vessel]: date of loss cited as 20 April 1987). Heather Bloom, Harbour reports this vessel was raised & removed.	WRK 321832	Historic Environment al Record	NM 68128 97779	4
Annie's Brae, Roman Catholic Church of St Patrick In Davies Brae, two simple but dignified landmarks: Reginald Fairlie's St. Patrick's Church (RC), 1935, a functional, low-lying apsed hall typical of Fairlie's simpler Catholic churches which provide for the requirements of the liturgy with straightforward elegance and no fuss and J. G. Falconer's gothic apsed and buttressed St. Columba's Church of Scotland, perched on a crag above the road	Canmore 108388	Historic Environment al Record	NM 67508 96905	-
Mallaig Station Mallaig Station, 1901, possibly James Miller Terminus station building deviating from the standard chalet-style structures along this line in providing a domestic-looking street frontage combining dwelling above office, with access through to an island platform, now shorn of its canopy. In its earlier days, the track continued beyond the Station and over the inshore end of what is now the Steamer Pier, to the water's edge.	Canmore 108368	Historic Environment al Record	NM 67561 97054	-
1-4 Victoria Place Railway Buildings, Victoria Place, c.1901 Interesting group of social housing arranged in four blocks of four flats each, back-to-back across a drying green.	Canmore 108617	Historic Environment al Record	NM 67483 96894	-
5-8 Victoria Place Railway Buildings, Victoria Place, c.1901 Interesting group of social housing arranged in four blocks of four flats each, back-to-back across a drying green.	Canmore 252333	Historic Environment al Record	NM 67468 96873	-
9-12 Victoria Place Railway Buildings, Victoria Place, c.1901 Interesting group of social housing arranged in four blocks of four flats each, back-to-back across a drying green.	Canmore 252334	Historic Environment al Record	NM 67485 96865	-

Site/Description	Index No. Primary Reference	Designation /Status	Location (OS NGR)	Mapped Point
13-16 Victoria Place Railway Buildings, Victoria Place, c.1901 Interesting group of social housing arranged in four blocks of four flats each, back-to-back across a drying green.	Canmore 252335	Historic Environment al Record	NM 67500 96880	-

5.3 Landscape and Visual

Mallaig Harbour lies 1.5km South West of the Knoydart National Scenic Area (NSA) (Drawing 69.01.05). The Knoydart NSA encompasses an area of 39,500ha and is designated for being one of the last remote and wildest places within mainland Britain. The Knoydart NSA has some of the grandest coastal and mountain scenery on the west coast and is an example of previously glaciated landscape. The designation is also related to the experience and visual impact of the mountains at sea level and for dramatic and contrasting sea lochs in Loch Hourn and Loch Nevis. As the development is outside of these areas, low lying and in an already developed area, it is highly unlikely the works will compromise the integrity of the nearby NSA.

5.4 Land, Air and Water

5.4.1 Land

The underlying geology of the development is classed as raised marine beach deposits of a sand and gravel composite (British Geological Survey, 2020). The marine geology is recorded by Marine Scotland as a metasandstone and metamudstone (Marine Scotland, 2020). The area in relation to the development in the Outer Harbour has previously been dredged to the base rock with minimal sediment layer remaining within the Outer Harbour area.

Within the specific area of the Outer Harbour, there is little to no sediment layer, however, grab samples will be taken where possible to determine the status of the material.

5.4.2 Air

Mallaig Harbour is not within an air quality management zone. There is only one Air Quality Management Area in the whole of the Highland Council Area (Air Quality in Scotland, 2019) which is within Inverness city centre and covers a small area on a busy junction between three streets. No air quality data exists for the development area however, it is anticipated that air quality will be high based on the rural, coastal location.

5.4.3 Water

Mallaig Harbour is surrounded by three coastal water bodies; Loch Nevis (ID: 200098), the Sound of Sleat (ID: 200109) and Ardnamurchan to Southern Skye (ID: 200355), all of which are classified as overall 'good' status in the Scottish River Basin District (SEPA, 2020).

There are no bathing waters monitored by SEPA within the development footprint. The closest bathing waters to Mallaig is Ganavan Bay, near Oban, approximately 65km south of the harbour. There are no freshwater watercourses within the proposed development area.

5.5 People

The total population of Mallaig as of the 2011 census was 858 with the highest occurring age group between 30 and 60 years old (National Records of Scotland, 2011).

As of 2011, 442 residents were recorded as being in employment with the main sectors being transport and storage, wholesale and retail, agriculture, forestry and fishing and accommodation and food. It was estimated that the harbour supports approximately 200 Full Time Equivalent (FTE) jobs within multiple business which operate from the harbour such as MOWI, CalMac and Ferguson Transport (Mallaig Harbour Authority, 2017; de Jong and Varley, 2018). This means that approximately half of Mallaig's workforce work in jobs related to the harbour. Of the employment related to the harbour, 65 of these are within the fishing industry and a further 44 within aquaculture (MHA, 2020).

The fishing industry continues to be one of the main sources of employment within Mallaig. It was recorded in 2014 that 6.8% of the people living in Mallaig were employed in fishing, farming and agriculture compared to 1.5% across Scotland (de Jong and Varley, 2018 & Office for National Statistics, 2014). There is a high level of membership to The Mallaig & North-West Fishermen's Association (MNWFA), one of the largest fisherman's trade associations in the UK. Members include those operating a range of boats from single operated creel boats to the large commercial white fish trawlers (Scottish Fishermen's Federation, 2020).

It is expected that there will be creels deployed in the vicinity of the Harbour by local fishermen however, as the works to be undertaken are entirely located within the existing Harbour basin and navigation channel where laying of creels is not permitted, no conflict with existing creels is anticipated. No fish farms were noted within the immediate area of Mallaig Harbour and the nearest, salmon farms operated by Scottish Sea Farms are located in Loch Nevis, approximately 6km, 8km and 10.5km away.

The ice plant, located on the ice quay, is utilised by a number of fishing vessels. Although vessels berth alongside the ice plant and load ice directly, there is the opportunity for ice to be decanted into insulated bins and transferred elsewhere on the Harbour to be loaded onto fishing vessels, and this will need to be managed throughout the construction period. The MOWI harvest station has an independent source of ice.

Mallaig is a popular tourist destination. Situated at the end of the Road to the Isles, it is a gateway to the Scottish Islands with ferry links to the Isle of Skye, South Uist and the Small Isles. CalMac saw an increase of 33,490 passengers between 2012 and 2016 (de Jong and Varley, 2018; CalMac, 2017). This increase is due to the increasing popularity of the Scottish Islands as holiday destinations (and the introduction of Road Equivalent Tariff). The Jacobite Steam Train made famous by the Harry Potter films and coined the 'Hogwarts Express' travels along the West Highland Line which terminates in Mallaig. Mallaig also hosts a food festival, 'Taste the Wild' which in its first year in 2016, was held on the harbour and involved 22 local producers and restaurants.

The town has a variety of local services including a small supermarket, a convenience store, two hotels, Bed & Breakfasts, self-catering accommodation and a variety of cafes, restaurants, pubs, and shops supporting the tourism industry (Mallaig Harbour Authority, 2020).

Within Scotland, 7.2% of employment is tourism related. An estimated 11.8% of the local population in Mallaig are employed within the accommodation and food services sector (de

Jong and Varley, 2018). In 2019, unemployment in the Lochaber area was estimated at 1.6% which is low when compared to a Scottish National Average of 3.2% (HIE, 2019).

Mallaig also has a primary and secondary school and a medical health centre which offers GP services and minor surgeries. For major medical requirements, the closest hospital is the Belford Hospital in Fort William, 42 miles by road.

5.6 Traffic, Transportation and Navigation

The development is situated within the harbour area and approximately 152m away from the nearest road. Road access to Mallaig is via the A830 from Fort William and which terminates in Mallaig. Annual average daily traffic estimates using two count points on the A830 over the previous 5 years are detailed in Table 5.6. One count point, 50729, is situated by Arienskill, by Lochailort, approximately 28.3km from Mallaig and the other, 30799, by Kinlocheil, approximately 50.7km from Mallaig.

Table 5.3: A830 Annual Average Daily Traffic Estimates

		Motorcycles	Cars and Taxis	Buses and Coaches	Light Goods	HGV	Total
Count point 30799	2015	584	1379	32	25	158	2018
	2016	586	1421	32	26	163	2168
	2017	559	1420	33	27	169	2209
	2018	525	1415	32	28	172	2233
	2019	486	1427	31	28	171	2241
	Average	548	1412	32	27	167	2174
Count point 50729	2015	293	989	34	34	72	1422
	2016	317	1018	35	35	74	1480
	2017	338	1018	36	35	77	1504
	2018	354	1014	35	37	78	1518
	2019	352	1023	33	37	78	1524
	Average	331	1012	35	36	76	1490

A number of incidents, approximately 40, have occurred along the A830 from Mallaig to Fort William, in the last five years. Most of these are classed as slight however, 3 serious incidents and a fatality have occurred within approximately 30km of Mallaig. A serious incident occurred on the 27th of June 2016 to the south of the town and involved 3 vehicles. Another serious incident occurred on the 27th of July 2019 and involved 1 vehicle near Arisaig. A further serious incident occurred on the 25th of August 2019 by Lochailort and involved 4 vehicles. The fatality occurred within 30km of Mallaig on the 27th of June 2015 and involved 1 vehicle.

As noted in Section 5.5: People, the town also has a rail connection with Fort William. In addition to The Jacobite Steam Train, which is mainly a tourist attraction, Scotrail provide services daily between Mallaig and Fort William. Additional services also run from Mallaig to Glasgow and the central belt.

CalMac operates a ferry service to the Inner and Outer Hebrides and Small Isles. The ferry also transports cargo to the Islands and is part of the lifeline services for the islands.

The marina within Mallaig Harbour serves as a stopover for sail boats and pleasure crafts. Mallaig is often used as a base from which sailboats can explore the nearby islands.

6 Potential Effects

6.1 Construction

Table 6.1 provides a description of the environmental aspects requiring consideration resulting from the construction of the proposed Mallaig Outer Harbour Splay Berth. It outlines the sensitivities as detailed in Section 6, identifies any likely significant effects, and proposes mitigation measures, if required, for negative effects on the environment.

Table 6.1: Construction Effects and Sensitivities

Aspect		Source	Sensitivities	Likely Significant Effect (excluding mitigation)	Any mitigation measures?
Use of Natural Resources	Use of Material (e.g., steel)	Rock for rock armour. Infill materials for land reclamation, in addition to dredge material. Steel for tubular piles. Concrete for quay deck and beam. Concrete or asphalt for surfacing.	None	NO	Efficient use of resources and re-use of materials including rock armour. Appropriate design for long life in marine environment including corrosion protection of steel elements.
	Use of Land and/or Soil	Dredge spoil from deepening of harbour.	None	NO	The volumes of material dredged will be minimised through design and re-used as infill.
Employment	Job Creation	The construction project will create direct and indirect employment associated with the development.	People - Economy	YES - Positive	Encourage local supply chain involvement.
Residues and Emissions	In-Air Noise	Infilling works in reclamation area. Removal of rock armour. Rock armour placement. Piling. Dredging. Blasting.	People - Community of Mallaig	NO - Development will be within the north west corner of the harbour with approximately 152m to the nearest road and 180m to the nearest residential property. The area is already a working harbour and ferry port and will be subject to noise throughout the day. Vessel movements and operations are also ongoing through the night.	All works, except dredging (not blasting), will be within the set working hours.

Aspect		Source	Sensitivities	Likely Significant Effect (excluding mitigation)	Any mitigation measures?
	Vibration	Blasting	Harbour Infrastructure	NO – Blast vibration studies are being undertaken to allow the blast to be designed such that existing quays and structures thereon will not be structurally impacted.	Appropriate blast plan developed and adhered to.
	Underwater Noise	Plant and vessel movements. Rock infill/material placement. Vibro and impact piling. Dredging. Blasting.	Biodiversity - Marine Mammals. Basking Sharks Biodiversity - Inner Hebrides and Minches SAC.	YES – Negative, primarily due to pilling and blasting as the noisiest activities.	All plant/vessels used will be well maintained. Rock infill and material placement will occur within the harbour basin with the Outer Harbour wall acting as noise a barrier. Any rock removal by blasting will be within the confines of the outer harbour basin. The basin entrance faces due east across a 120m wide channel between it and the shore, limiting the propagation of noise to open water beyond the harbour entrance channel. The majority of the dredging activity to remove deposits above rockhead level will also be contained within the confines of the outer harbour basin, with a similar limitation on noise propagation to areas beyond the harbour. An EPS licence will be in place with the appropriate mitigation measures including a Marine Mammal Observation protocol for loud activities (blasting and piling) determined by results of an underwater noise assessment.

Aspect		Source	Sensitivities	Likely Significant Effect (excluding mitigation)	Any mitigation measures?
	Air Quality (Emissions - dust)	Rock infill. Material placement. Plant and vehicle movements.	People - Harbour users and facilities.	NO – the nearest industrial receptor is approximately 45m from the development area. Other sensitive dust receptors including residential properties are too far from the development.	Dust management in line with good construction practice. This includes limiting stockpiles of materials and localised dampening and road sweeping, if required.
	Air Quality (Greenhouse Gases and Climate Change)	Plant and vehicle movements. Material imports.	Possible climate change contribution.	NO	Plant and vehicles will be well maintained. Re-use of materials to limit the amount of bulk material being imported to site. Road transport to be minimised where practicable.
	Water Quality (Marine – Pollution)	Risk of unplanned emissions / release of pollutants from, i.e. <ul style="list-style-type: none"> Waste material Oil/fuel storage and handling Plant/machinery fault 	Water Quality. Biodiversity – Marine. Biodiversity – Inner Hebrides and Minches SAC.	NO	Works conducted in line with standard best practice and existing guidelines: <ul style="list-style-type: none"> Storage and handling; Waste management; Surface water management; and Pollution prevention plan and spill management plan in place during construction. Plant and machinery will be appropriately maintained.
	Water and Seabed Quality	Increased sediment in the water column associated with blasting dredging and dredge disposal.	Biodiversity – Marine Mammals Biodiversity – Inner	NO	Dredge limited in depth, minimising volume, and duration of dredge. Disposal route will be identified through the dredge licensing BPEO assessments processes. Reuse of

Aspect		Source	Sensitivities	Likely Significant Effect (excluding mitigation)	Any mitigation measures?
			Hebrides and Minches SAC (Harbour Porpoise)		dredge spoil in construction works as far as practicable.
	Water and Seabed Quality	Dredge disposal, especially of larger particle sizes causing physical damage as the fall through the water column.	Biodiversity – Marine Mammals Basking Shark Biodiversity – Inner Hebrides and Minches SAC (Harbour Porpoise)	YES - Negative	EPS licence detailing mitigation measures to prevent physical injury to marine mammals and basking shark during any dredge disposal.
	Light Emissions	Light for construction.	Visual impact. Biodiversity – Marine, Terrestrial and Ornithology.	NO - Works will be carried out in an already lit area with navigation lights in use and street lighting throughout hours of darkness with construction lighting only added where required.	Works will also be carried out in accordance with best practice and in line with guidance notes, Scottish Executive Guidance Note, 'Controlling light pollution and reducing lighting energy consumption' and the 'Safety in Ports (SIP) 009 – Guidance on Lighting.' Measures include: <ul style="list-style-type: none"> • Over-lighting will be avoided and designed to industry recommended levels; • All lights will be carefully directed to where they are most needed and will be designed to minimise light pollution; and

Aspect		Source	Sensitivities	Likely Significant Effect (excluding mitigation)	Any mitigation measures?
Traffic, Transport, Access, and Navigation	Traffic and Transport	Vehicle movements along the A830 delivering construction materials.	Traffic. Transport.	NO	<ul style="list-style-type: none"> Construction lighting will be switched off when not required and all works will be carried out during the set working hours. <p>The reuse of dredge material reduces the requirement to deliver construction materials. Some materials may be delivered by sea. Traffic Management will be considered within the Construction Environmental Management Document (CEMD).</p>
	Navigation	Construction works, including dredge and disposal, and vessel and plant movements. Impacts on berth availability (ice plant and outer breakwater quay). Additional navigational hazards within the Outer Harbour.	Berth users (Fishing boats & Aquaculture vessels).	YES – Negative	<p>Minimise time berths are unavailable. Effort to be made when bad weather is predicted i.e., storms to make berths available. Good communication with harbour users including appropriate Notice to Mariners posted. Input from the Harbour Master pre and during construction works. Harbour Master retains control of safety during works, coordinating movements as required. Harbour will arrange Ice deliveries to alternative location within harbour for vessels requiring ice unable to utilise the ice quay due to construction works.</p>

There were three potentially significant effects arising from the construction stage of the project as identified in Table 6.1. One of these has been identified as positive however, the remaining three will require mitigation and are discussed below.

6.1.1 Underwater Noise

Blasting of rock and piling works will be undertaken giving rise to underwater noise. These activities will be carried out within the Outer harbour basin where the existing quay wall will act as a barrier to underwater noise, and the alignment of the basin entrance towards shore will mean that noise levels reduce rapidly within a localised area. Underwater noise can have an adverse impact on basking sharks, otters and marine mammals including the features of the Inner Minches and Hebrides SAC.

An underwater noise assessment is planned, and modelling will be completed to understand the scale of the effects and to inform mitigation requirements as detailed in Section 7.

6.1.2 Water and Seabed Quality (Marine)

Blasting, dredging and dredge reuse/disposal will give rise to increased sediment in the water column. The area to be dredged is largely made up of bed rock and sands with siltier material at the entrance of the harbour. Sedimentation will be highest in this area; however, this will be localised. The dredge is limited in depth and will therefore minimise the volume and duration of dredging.

A BPEO assessment required for the dredge licence will identify the reuse/disposal route. The bulk of the dredge material will be used as infill in the reclamation area, however, some leftover material may require disposal.

Dredge disposal would give rise to localised sedimentation and smothering effects at the dredge disposal site. The closest dredge disposal site at Armadale (HE070) will be considered within the BPEO assessment. The disposal site is situated within the Inner Hebrides and Minches SAC, designated for harbour porpoise. Other marine mammals and basking sharks could also be encountered in this area.

Disposal of materials could result in physical injury to marine mammals and basking sharks. This will be considered within the EPS licence application and mitigation measures may include the implementation of a Marine Mammal and Basking Shark protocol where observations are carried out prior to disposal at sea.

6.1.3 Navigation

During construction, there will likely be impacts on berth availability at the ice quay and outer breakwater quay. It is possible that there will also be additional navigational hazards during works, i.e., during dredging and piling works where a piling rig and dredger will be in the area. In addition, vessels may be unable to access the ice plant during construction hours. MOWI well boats utilise a berth on the Outer Breakwater Quay during the night for transfer of salmon to their Harvest Station, and the works will require to be arranged such that this arrangement can continue. Dredging which may be carried out through the night and access for fishing boats and other vessels during the day will need to be managed by Contract conditions setting out limitations on working areas and requiring close cooperation between the Contractor and the Harbour Master.

6.2 Operations

Table 6.2 provides a description of the environmental aspects arising during operations of the Mallaig Harbour Outer Splay Berth. It outlines sensitivities as per Section 5, identifies likely significant effects and proposes mitigation measures for negative effects, if required, on the environment.

Table 6.2: Operational Effects and Sensitivities

Aspect		Source	Sensitivities	Likely Significant Effect (excluding mitigation)	Any mitigation measures?
Residues and Emissions	In-Air Noise and Vibration	A slight increase in noise may result from increased vessel movements within the harbour.	People.	NO	No mitigation required. Sensitive noise receptors including residential properties are too far from the development to experience noticeable increases in noise levels.
	Water Quality (Marine – Pollution)	Risk of unplanned emissions / release of pollutants from quayside operations.	Water Quality.	NO	Harbour operations conducted in line with best practice and existing guidelines: <ul style="list-style-type: none"> • Storage and handling; • Waste management; and • Port's spill procedures.
	Light Emissions	Port lighting.	People. Biodiversity – Ornithology.	YES - Negative	A lighting assessment will be carried out in accordance with the Scottish Executive Guidance Note, 'Controlling light pollution and reducing lighting energy consumption' and the 'Safety in Ports (SIP) 009 – Guidance on Lighting' note. Note this includes the need to consider environmentally sensitive and designated sites hence ornithological considerations will be included within the lighting design. Lighting assessment will inform the design and include mitigation measures. These may include directional lighting, low level lighting, etc.

Aspect		Source	Sensitivities	Likely Significant Effect (excluding mitigation)	Any mitigation measures?
	Underwater Noise	Increased number of fishing or other vessels in area.	Biodiversity – Marine Mammals.	NO	Already a working port, berthing capacity increase not large enough to significantly change vessel numbers.
Employment	Job Creation	Operational jobs – increased space for fishing and aquaculture industries, potential to increase activity in area and associated jobs	People - Economy	YES - Positive	Encourage local supply chain involvement.
Landscape and Visual	Landscape and Visual	Development of Outer Harbour Splay Berth.	Landscape - Knoydart National Scenic Area.	NO	Low lying project, inside an area already developed.

There were two likely significant effects arising from the operational stage of the project as identified in Table 6.2. These include one positive impact being the benefit of more job opportunities and one negative resulting in increased light emissions which is discussed further below.

6.2.1 Light Emissions

Lighting installed for the operational phase of the development may have a negative impact on the local population of Manx shearwaters (*Puffinus puffinus*). Manx shearwaters are known to fly towards the lights of Mallaig whilst departing their nesting sites on the Isle of Rum and starting their migration south, stranding themselves in and around the town. This occurs particularly during strong westerly winds and low moonlight. Increased light levels could exacerbate this and hence sympathetic lighting design is required.

7 Mitigation

Mitigation identified to avoid significant negative effects along with general mitigation measures to minimise other environmental effects are detailed within this section. These will form the basis of the mitigation which will be submitted in support of the marine licence applications.

7.1 Pre-Construction Requirements

7.1.1 Underwater Noise and Vibration (Marine Mammals)

It is recognised that a Marine Mammal EPS licence will be required due to disturbance caused by construction activities. An underwater noise assessment including modelling of blasting will be carried out and will form the basis for the mitigation measures required. These will be detailed in the EPS application and are likely to include the implementation of a Marine Mammal and Basking Shark Protocol which will involve carrying out observations to ensure no marine mammals or basking sharks are in the area prior to blasting to avoid physical harm and prior to piling to minimise disturbance effects and physical harm from underwater noise. The underwater noise assessment will also be considered and submitted as part of the marine licence applications.

7.1.2 Water and Seabed Quality

Grab samples will be taken in alignment with Marine Scotland's Pre-disposal Sampling Guidance, the results for which will be utilised in the BPEO assessment to identify the most appropriate use/disposal route for dredged material.

If appropriate dredge spoil will be reused in the construction as far as practicable. Disposal of excess dredge material at the disposal ground if appropriate, will consider physical injury of marine mammals and the implementation of Marine Mammal and Basking Shark Protocol as mitigation in the Marine Mammal EPS licence application.

7.1.3 Light Emissions

A lighting assessment will be carried out and will be used to inform the design. The assessment will be carried out using the Safety in Ports (SIP) 009 – Guidance on Lighting and the guidance note Controlling light pollution and reducing lighting energy consumption (Scottish Executive, 2007). The assessment will identify ways in which impacts on Manx shearwater can be reduced and may include mitigation measures such as directional, beam focused and low Kelvin level,

a measure of the colour temperature of light, as far as practicable. A lower Kelvin towards the red end of the visible light spectrum is less attractive to Manx shearwaters and will be considered for use if practicable. Extra measures may be appropriate during the key period between late August and early October when birds are fledging and are more susceptible to grounding. Ecological lighting mitigation will need to be balanced with Health and Safety and operational requirements of the port, hence ecological mitigation measures will be implemented where practicable and safe to do so.

7.1.4 Traffic and Transport

Traffic Management will be considered with a Traffic Management Plan forming part of the CEMD. This will take account of sensitive receptors which may include taking tourist or ferry traffic etc. into account. Mitigation measures can include timing deliveries to avoid the busiest times.

7.1.5 Navigation

Prior to construction commencing, good communication with the Harbour Master will be required and appropriate Notice to Mariners will be posted.

Input from the Harbour Master will be sought with regard to the planning and programming of construction works to ensure navigational risks are minimised. Management and planning of works will be required to allow for berth accessibility. Plans will also take account of the ferry timetable.

7.1.6 General Mitigation

The detailed design process will take account of the environmental sensitivities identified in Section 5. Where potential effects arise from construction works, appropriate mitigation will be identified and detailed within the CEMD. Risk Assessment Method Statements will be in place for all construction tasks. These will include any environmental precautions and mitigation measures as highlighted within the CEMD. Mitigation measures will be in alignment with construction guidance as noted in Section 7.2.5.

7.2 Construction Mitigation

7.2.1 Underwater Noise and Vibration (Marine Mammals)

Mitigation measures developed as detailed in Section 7.1.1 will be implemented, to ensure physical harm and disturbance of marine mammals is avoided as far as practicable.

7.2.2 Water and Seabed Quality

Works will be undertaken in line with the conditions stated on the dredge licence and will follow the disposal route identified from the BPEO assessment. Disposal at the disposal site will be undertaken in line with the appropriate mitigation identified within the Marine Mammal EPS licence. This is likely to include undertaking marine mammal monitoring prior to disposal to prevent injury during dumping.

7.2.3 Light Emissions

Construction works will be carried out following the Scottish Executive Guidance Note, 'Controlling light pollution and reducing lighting energy consumption' and the 'Safety in Ports (SIP) 009 – Guidance on Lighting'. This includes avoiding over lighting and carefully directing

light to areas where it is most needed, minimising light pollution where possible. Any additional construction lighting will be switched off when not required.

Construction of the lighting infrastructure will be installed as per design of which will have been informed by the lighting assessment and the appropriate guidance.

7.2.4 Traffic and Transport

The traffic management mitigation measures considered in the CEMD will be implemented and adhered to. Good communication will be maintained with the local community and notice provided of works commencing and any potential additional traffic on the roads.

7.2.5 Navigation

Good communication with the Harbour Master will be maintained with Appropriate Notice to Mariners posted during the works. The Harbour Master will retain control of navigation within the Harbour during the works, coordinating vessel movements as required.

Works will be arranged to minimise the amount of time berths are unavailable, and efforts will be made when bad weather is predicted, i.e., storms, to make berths available.

Works will also minimise the amount of time access to the ice plant will be restricted and ice deliveries will be made to alternative berths for vessels when required.

7.2.6 General Mitigation

In addition to the specific mitigation identified to manage effects that could be significant in the absence of mitigation, construction guidance will be followed to minimise other potential negative effects of the projects, this is likely to include:

- Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2014);
- Guidance for Pollution Prevention 1 (GPP1): Understanding your environmental responsibilities – good environmental practices. (NRW, NIEA & SEPA, 2020);
- Guidance for Pollution Prevention 5 (GPP5) – Works and maintenance in or near water (NIEA, 2018);
- Pollution Prevention Guidance 6 (PPG6) – Working at construction and demolition sites (Environmental Agency et al., 2012);
- Pollution Prevention Guidance 7 (PPG7) – The safe operation of refuelling facilities (Environment and Heritage Service, SEPA, & Environment Agency, 2011);
- Guidance for Pollution Prevention 8 (GPP8) – Safe Storage and Disposal of Used Oils (SEPA, Natural Resources Wales, & NIEA, 2017);
- Coastal and Marine Environmental Site Guide: C584 (Budd, John, Simm, & Wilkinson, 2003); and,
- Guidance Note: Controlling Light Pollution and Reducing Lightning Energy Consumption (Scottish Executive, 2007).

8 Summary

Mallaig Harbour Authority wish to develop a Splay Berth Quay and deepen the area of the Outer Harbour in order to provide an increase in berthing space and quayside operating space. The deepening of the harbour will allow larger draughted boats to have access to the Outer Harbour without tidal restriction.

The project falls under the Marine (Scotland) Act 2010. Screening opinions are sought from Marine Scotland with regards to the Mallaig Outer Harbour Improvements Splay Berth and Deepening development under Regulation 10(1) of the Marine Works (EIA) (Scotland) Regulations 2017.

Potentially significant effects were identified without mitigation. However, mitigation measures have been identified for these aspects which reduce the resultant effects such that they are unlikely to be significant.

9 References

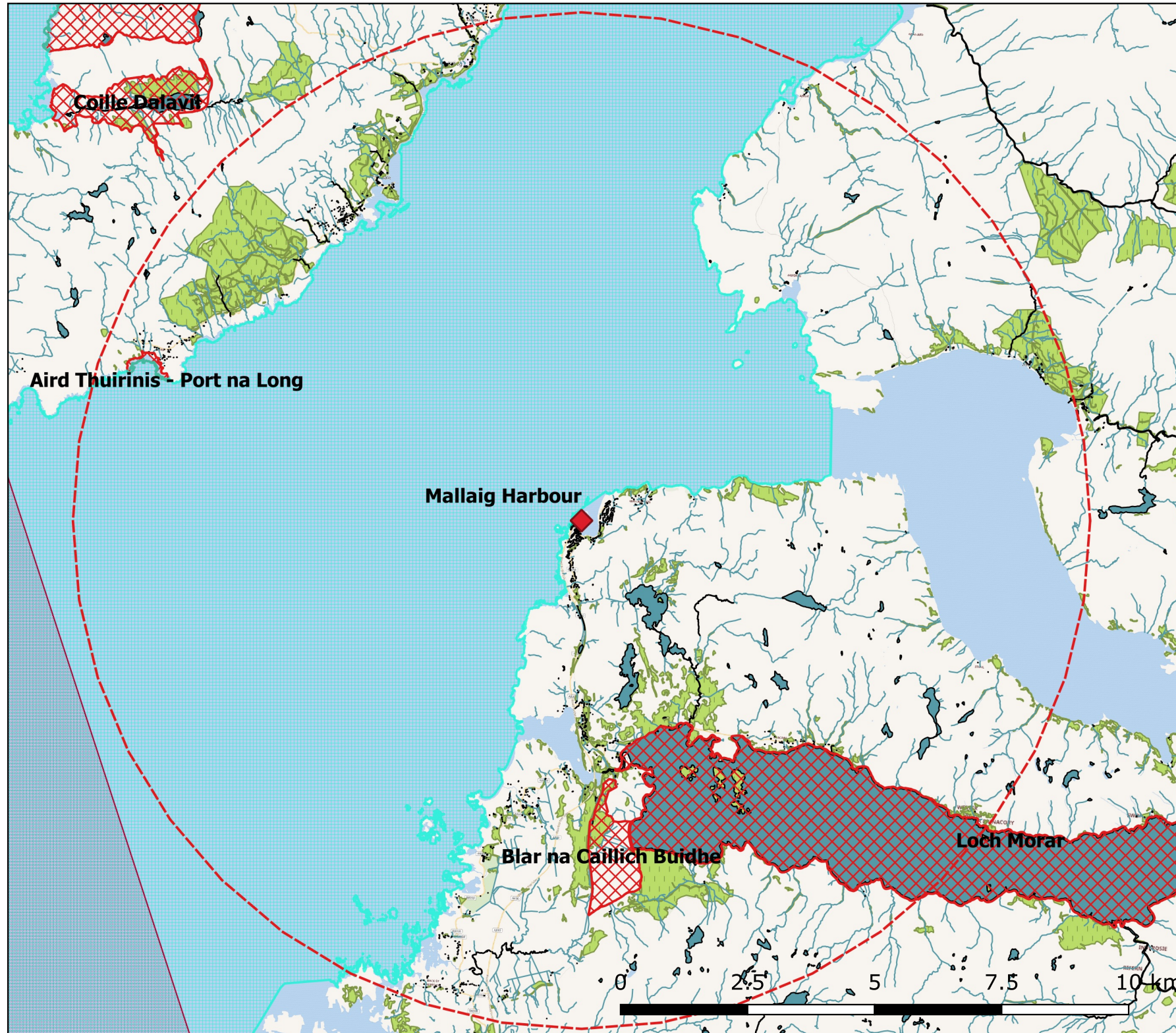
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10 Glossary

Acronym	Definition
CalMac	Caledonian MacBrayne
CD	Chart Datum
CEMD	Construction Environmental Management Document
EIA	Environmental Impact Assessment
EPS	European Protected Species
FTE	Full Time Employment
HES	Historic Environment Scotland
HIE	Highlands and Islands Enterprise
km	kilometres
m	metres
MHA	Mallaig Harbour Authority
MHWS	Mean High Water Spring
MLWS	Mean Low Water Spring
MNWFA	The Mallaig North West Fishermen's Association
MPA	Marine Protected Area
MS	Marine Scotland
NBN	National Biodiversity Network
NGR	National Grid Reference
NSA	National Scenic Areas
SAC	Special Areas of Conservation
SEPA	Scottish Environment Protection Agency
SLA	Special Landscape Areas
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
THC	The Highland Council

Drawings



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www.affriclimited.co.uk

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Page 1	Rev No: 1	Drawing Date: 22/09/2020
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- Legend**
- Mallaig Harbour Location
 - 10km Buffer
 - SSSI
 - MPA Sea of the Hebrides
 - SAC Inner Hebrides & Minches
 - Tidal Water
 - Fresh Water
 - Woodland



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Page 1

Rev No: 1

Drawing Date:
24/09/2020

Legend

-  Mallaig Harbour
-  1Km Buffer
-  Building's
-  Fresh Water
-  Main Road
-  Maritime Archaeology
-  Tidal Water
-  Woodland



0

1 km



Mallaig Harbour

1
2
3

4



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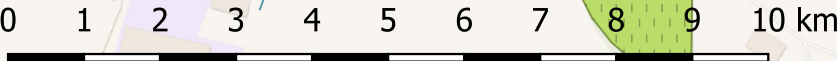
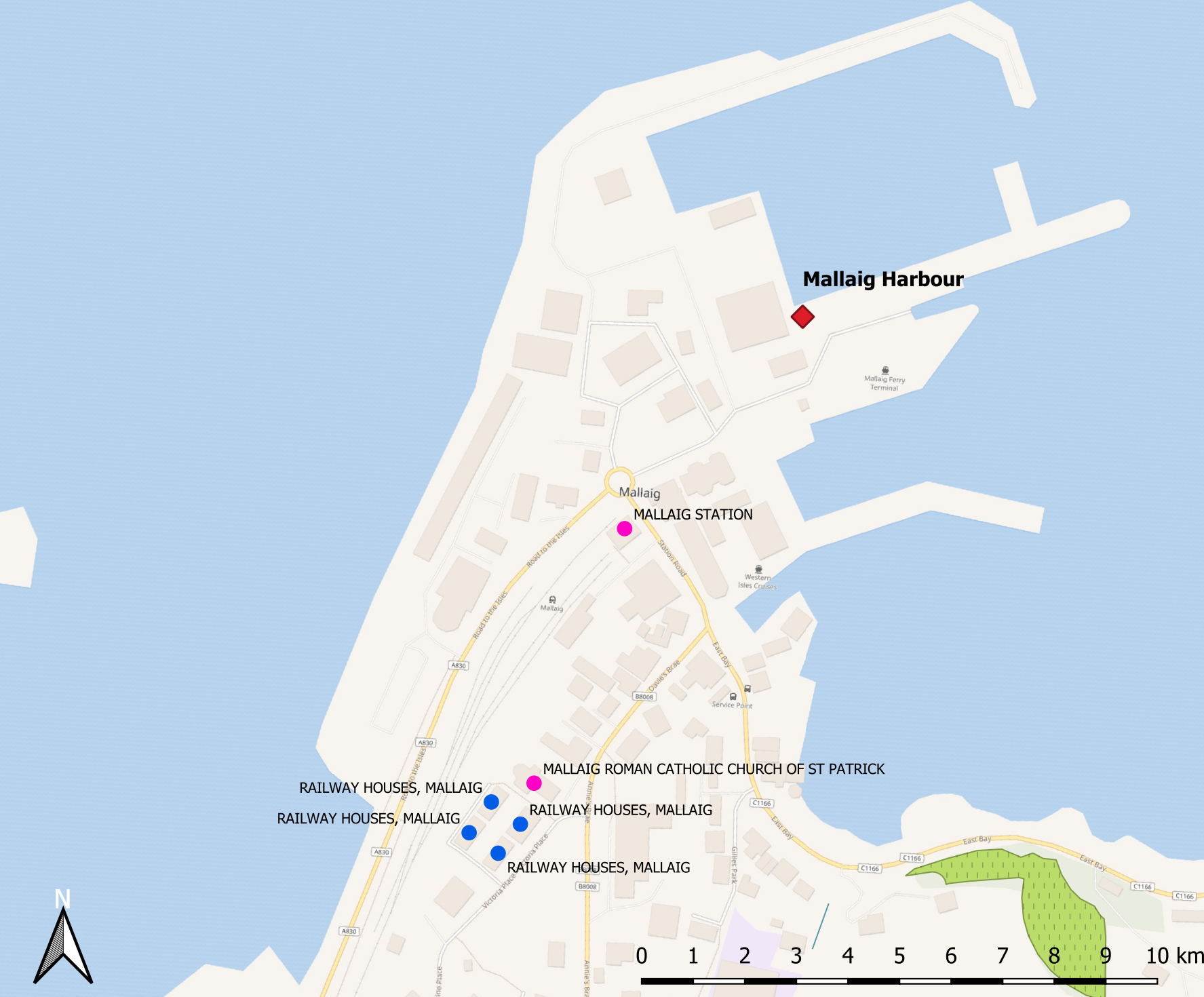
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Legend

- Mallaig Harbour
- Listed_Buildings
 - A
 - B
 - C
- Fresh Water
- Main Road
- Tidal Water
- Woodland



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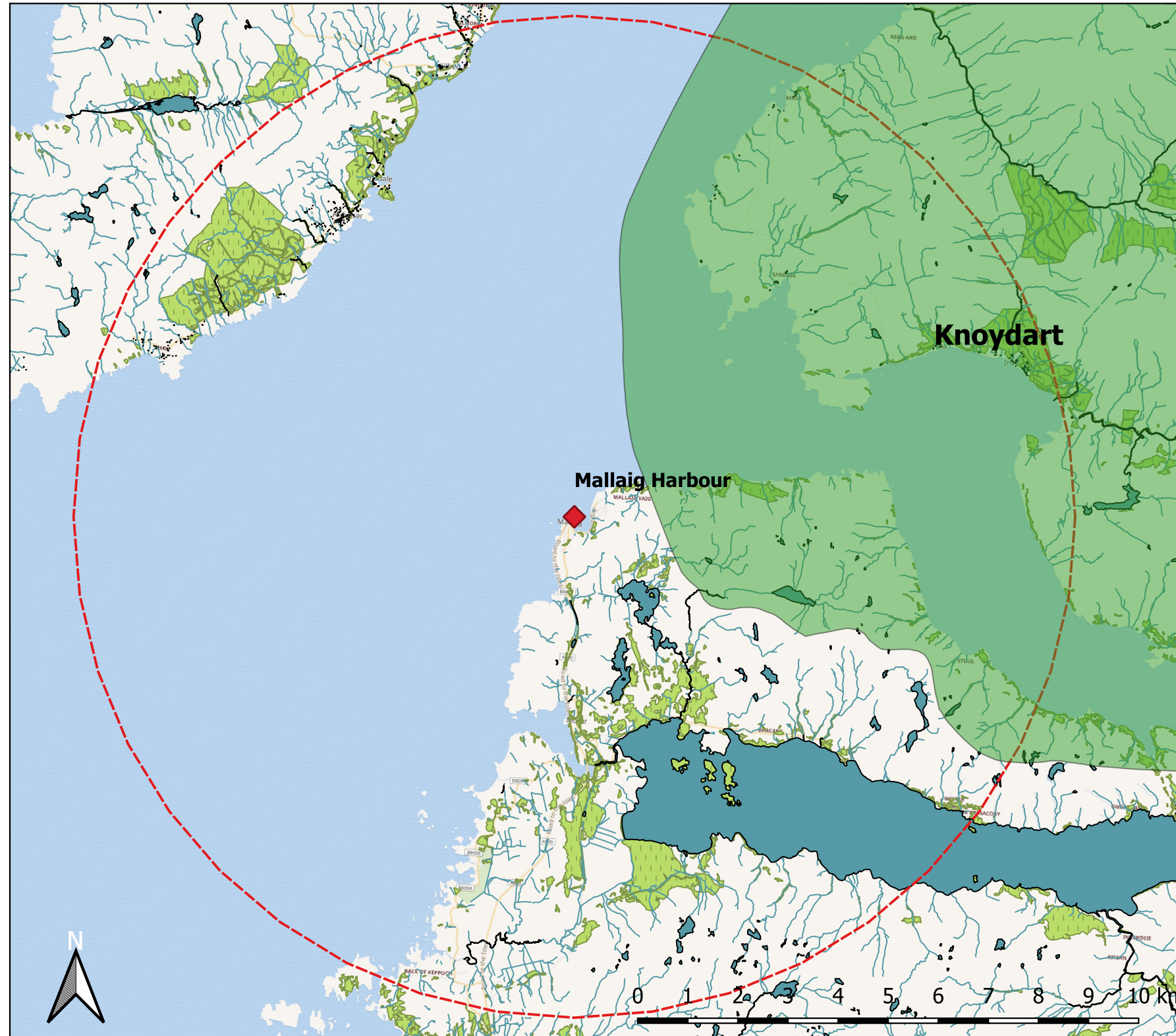
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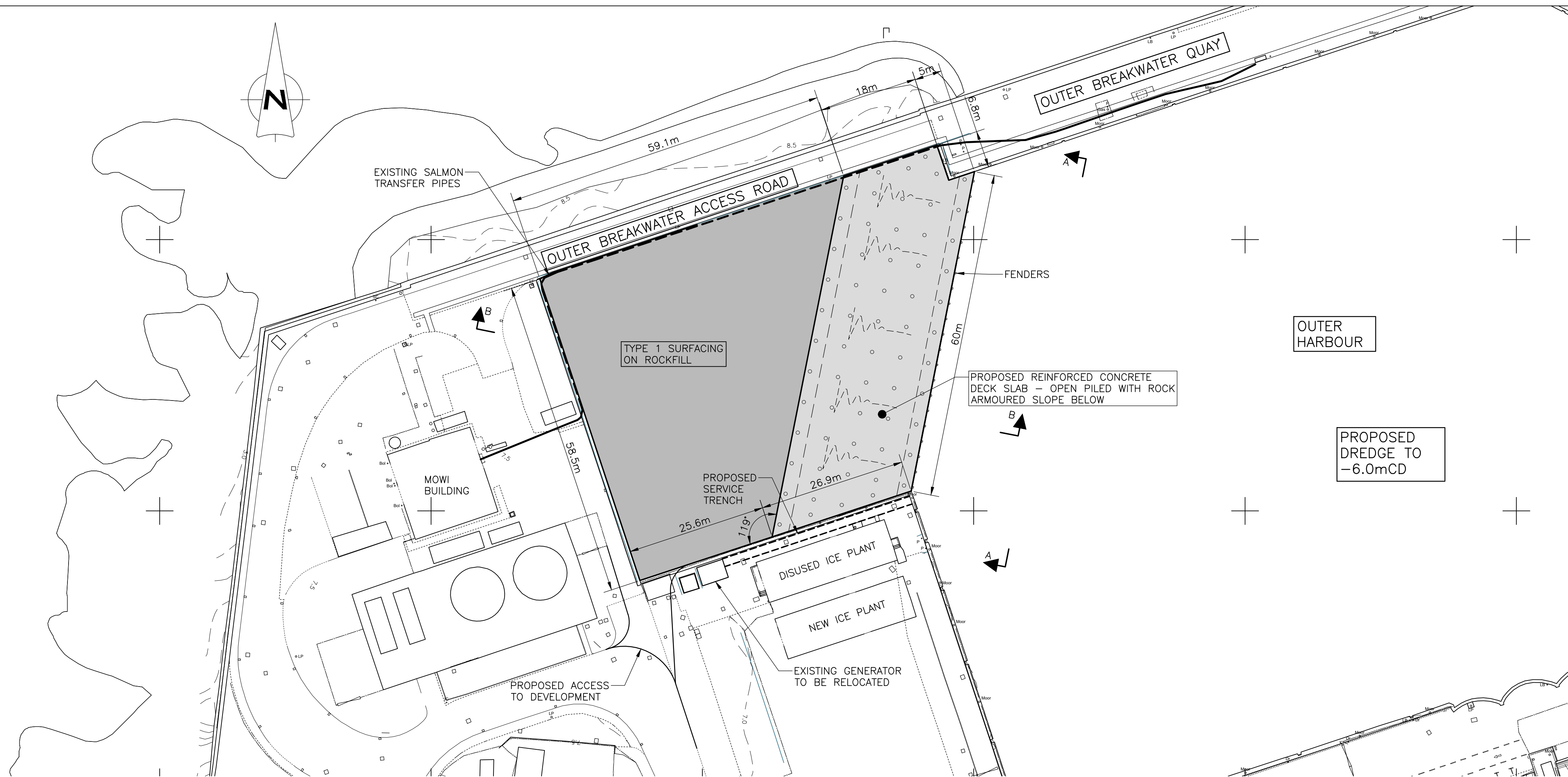
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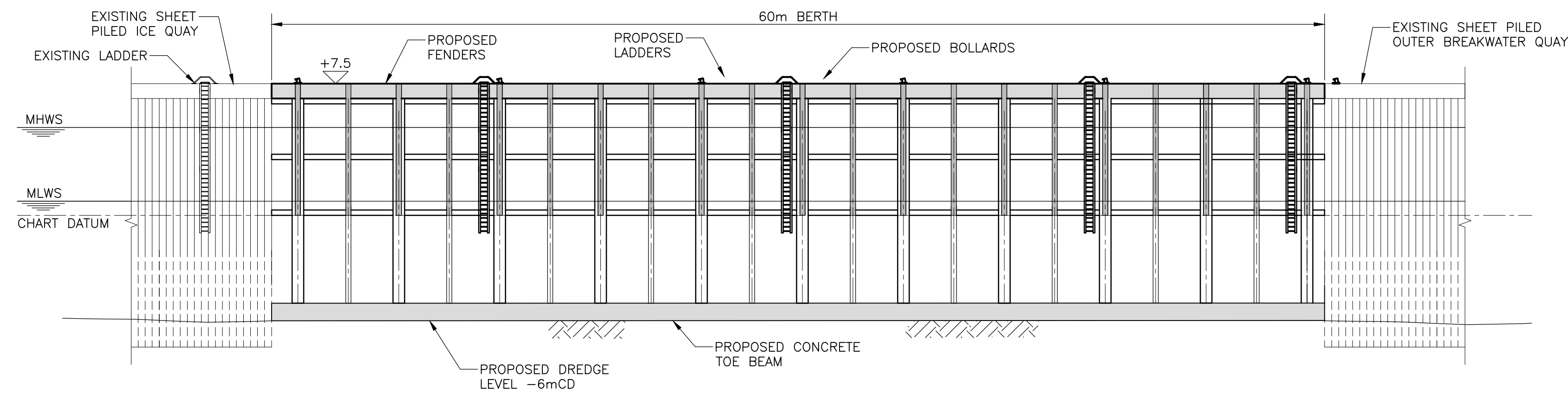
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-  Mallaig Harbour
-  10km Buffer
-  Knoydart National Scenic Area
-  Fresh Water
-  Main Road
-  Tidal Water
-  Woodland

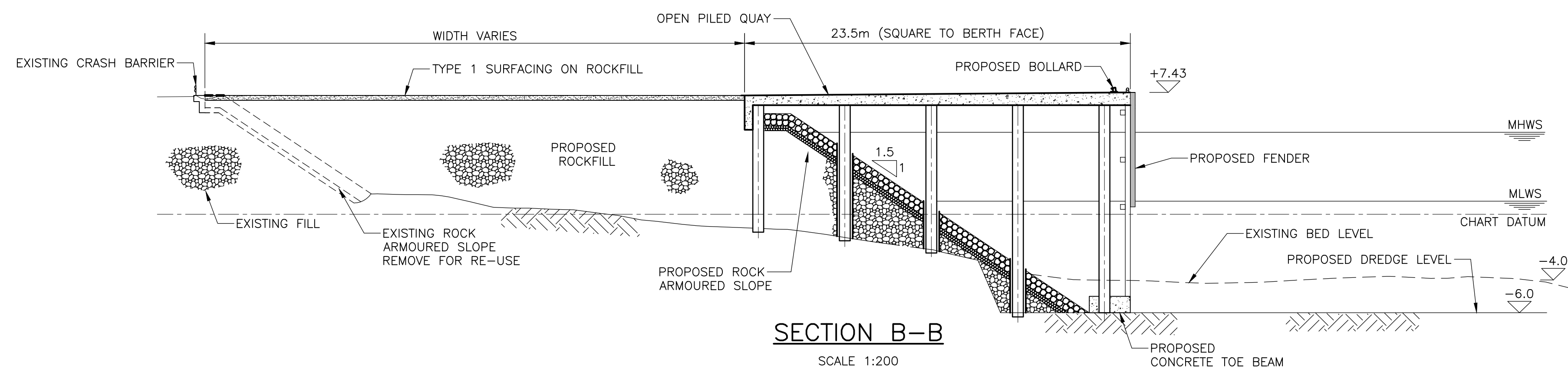




PLAN
SCALE 1:500



SECTIONAL ELEVATION A-A
SCALE 1:200



SECTION B-B
SCALE 1:200

GENERAL NOTES

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2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
3. TIDE LEVELS, ARE AS FOLLOWS
HAT +5.6mCD
MHWS +5.0mCD
MLWS +0.8mCD
LAT 0.0mCD
4. CHART DATUM IS 2.62m BELOW ORDNANCE DATUM.
5. LEVEL INFORMATION BASED ON ASPECT SURVEYS BATHYMETRIC SURVEY DATED MAY 2016.

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REV	DATE	DETAILS	DRAWN	CHK'D	APP'D

AMENDMENTS

CLIENT
MALLAIG HARBOUR AUTHORITY

PROJECT
OUTER HARBOUR IMPROVEMENTS

Wallace Stone
Consulting Civil Engineers

GLASGOW
0141 554 8233
glasgow@wallacestone.co.uk

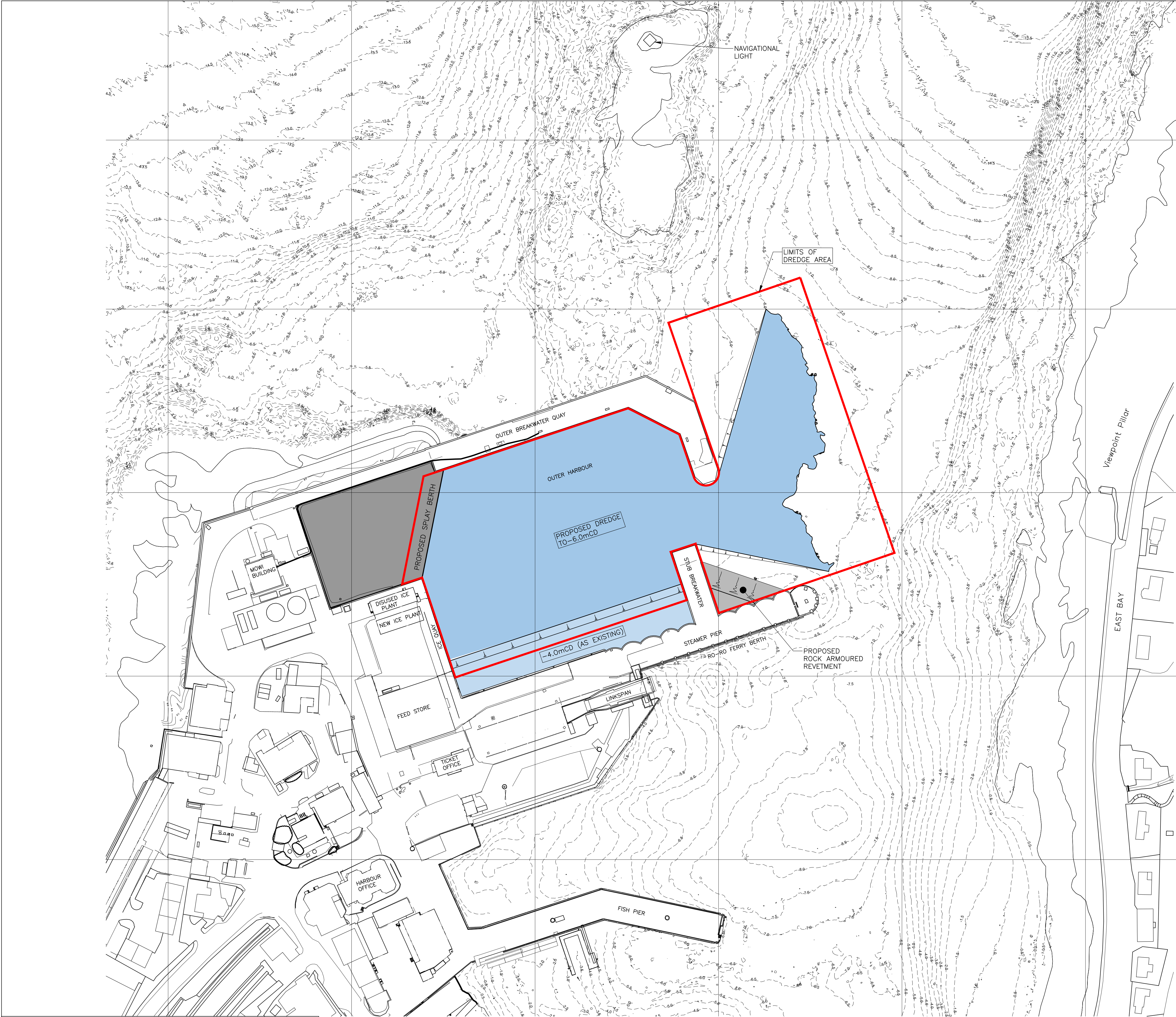
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01349 866775
dingwall@wallacestone.co.uk

HEBRIDES
01851 600220
hebrides@wallacestone.co.uk

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OUTER HARBOUR SPLAY BERTH
GENERAL ARRANGEMENT

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DATE OCT 20	DATE DEC 20	DATE DEC 20
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5. LEVEL INFORMATION BASED ON ASPECT SURVEYS BATHYMETRIC SURVEY DATED MAY 2016.

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PROJECT					
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