AFFric

Staffin Community Harbour Development

Environmental Impact Assessment Report

Volume 3: Appendices

September 2021

Appendix A1: The Environmental Impact Assessment Team

Staffin Community Harbour Development

Wallace Stone
Consulting Civil Engineers

DAL
DALGLEISH
ASSOCIATES
LIMITED

Document Control

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Contents

1 Introduction

Affric Limited have led the Environmental Impact Assessment Report (EIAR) production, however, it has been a team effort. Affric have worked closely with the client (Staffin Community Trust (SCT)), their engineers (Wallace Stone LLP, Jock Gordon Design and Planning, and Dalgleish Associates Limited) and with a variety of consultants to ensure that appropriate experts have contributed relevant technical input into the assessment. Table A.1 provides the details of lead companies for each of the chapters. Further information with regard to the experience and expertise of the various companies involved in the production of the EIAR is provided in Section 2.

Additionally, expert input was sought to assist in the baseline data collection of specialist topics and subsequent utilisation to inform topic specifics. As such, the experience and expertise of these companies and personnel have also been provided in Section 2.

The EIAR was subject to a review process, internal reviews were completed by the Affric team in addition to reviews by relevant wider team members.

Table A.1: Lead Companies

Chapter	Lead Companies
1: Introduction	Affric Limited
2: Project Description	Affric Limited Dalgleish Associates Limited
3: Methodology	Affric Limited
4: Statutory Context & Policy	Affric Limited
5: Air Quality and Climate Change	Dalgleish Associates Limited
6: Archaeology and Cultural Heritage	AOC Archaeology Group
7: Biodiversity	Affric Limited
8: Benthic Ecology	Ocean Ecology Ltd
9: Fish Ecology	Affric Limited
10: Marine Mammal	Affric Limited
11: Terrestrial Ecology	Affric Limited Tracks Ecology (Survey support)
12: Soils, Geology & Palaeontology	Dalgleish Associates Limited Oxford University Innovation Limited
13: Landscape & Visual Impact Assessment	Dalgleish Associates Limited
14: Noise and Vibration	Dalgleish Associates Limited Vibrock Limited (Modelling)
15: Traffic and Access	Pell Frischmann Consulting Engineers Ltd
16: Navigation	QEI Projects Ltd Affric Limited
17: Hydrology, Hydrogeology, Water Quality and Coastal Processes	Affric Limited RPS (modelling)
18: Population and Socio – Economics	Affric Limited
19: Schedule of Mitigation	Affric Limited
20: Conclusion	Affric Limited

2 Companies

2.1 Affric Limited

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

Chartered Environmentalist Fiona Henderson leads the Affric team. Her qualifications include a MSc in Environmental Impacts Assessments (EIA), Auditing and Management Systems and BSc *(Hons)* in Environmental Chemistry, and environmental noise monitoring competence certification. She has previously led the EIAR production and provided support through licensing, construction and into operations for a number of port and harbour developments. Hence, she is ideally positioned to produce and/or review both the 'up-front' chapters and technical chapters of the EIAR.

Senior Consultant, Bronwyn Fisher, has over 8 years' experience as an environmental consultant undertaking EIA. She has experience in developing Environmental Management Programmes, undertaking site audits and undertaking Public Participation. Bronwyn's project experience includes construction of pipelines, diesel storage installations, waste disposal sites, water treatment facilities, oil refineries, tank farm installations, recycling facilities, mixed-use developments, ports and harbours, industrial developments and renewable energy technology projects.

Environmental Consultant, Ewan Beveridge, has over 1.5 years' experience working in the consultancy sector and has experience carrying out desk and field-based surveys in a variety of terrestrial and aquatic environments. This has included protected species and ornithological surveys, peatland condition assessments and Phase 1 habitat surveying. Ewan holds a BSc (*Hons*) degree in Zoology, as well as an MSc in Ecology & Conservation. He has worked on a number of projects with Affric, providing environmental and ecological support to developments including harbour extension proposals and Environmental Clerk of Works support to construction. Ewan inputted to the biodiversity chapters with support from ecologist and Senior Consultant Kirsty MacDonald and marine mammal expert Consultant Jack Clarkson.

2.2 Wallace Stone LLP

Wallace Stone LLP was established in 1973 and is a member of the Association of Consulting Engineers. The company is particularly experienced in maritime civil engineering infrastructure, including: piers, harbours, ferry terminals and coastal protection. Wallace Stone provided engineering and project management support to numerous ports and Harbours across Scotland. The preliminary and detailed design works and construction input to the EIAR process has been led by John Porteous. In addition, he has provided a review function to the EIAR ensuring the engineering and construction plans have been appropriately incorporated. Through his 42 years of experience as a marine works designer and project manager, John has gained the skills to successfully develop designs for marine works and pontoon projects, and

to manage projects to meet Client requirements, ensuring the appropriate environmental, quality and health and safety standards. His track record in this respect is demonstrated by a high satisfaction level and return rate amongst his previous Clients.

2.3 Dalgleish Associates Limited

Dalgleish Associates Ltd was established in 1992 as a specialist minerals consultancy, providing planning services for quarrying and mining developments, including design and geotechnical assessment. The company has evolved over the years into a multidisciplinary planning consultancy. Their background in minerals provides an excellent foundation for the variety of work they currently undertake. Most of their work is within Scotland, although they also undertake work in the rest of the UK and the Isle of Man. Dalgleish Associates have an excellent track record in achieving planning permission for complex developments as well as simpler minerals applications.

Willie Booth is the Managing Director and is a chartered minerals surveyor with wide ranging knowledge of the minerals industry. Willie began his carrier in Scotland's deep coal mines and as a surveyor for British Coal and Scottish Coal. Willie leads the consultancy with his extensive minerals planning experience and is an RICS registered valuer.

Rob Latimer is a Director, with particular experience in landscape and visual impact assessment and ecology. Rob originally studied zoology, then focusing on EIA gained valuable experience with a number of small consultancies and environmental NGOs as well as through public sector work.

2.4 QEI Projects Limited

QEI Projects Ltd was established in 2001 as a vehicle for consultancy work and a variety of R&D projects that seek to find better ways of doing things. Malcolm Henry provides his clients with a useful mix of analytical skills and pragmatism that have been developed over 30 years of working out how to get things done within budget and on time. He has taken a lead role in a wide range of business activities including outdoor education, software development, tourism, R&D, construction, and more.

2.5 AOC

AOC is one of the most experienced heritage companies in Britain. They offer a full range of archaeology services, from excavations to lab analysis. AOC is dedicated to maximising public and community benefit from archaeology. The AOC consultants assist clients with planning projects around heritage issues.

Mark Littlewood is a Project Officer at AOC and has been a professional field archaeologist since 1997 after graduating from Bangor University with a BA in History with Nautical Archaeology in 1995 and then an MSc in Maritime Archaeology from the University of Southampton in 1996. As a highly experienced field archaeologist he has worked and supervised numerous commercial excavations and archaeological evaluations throughout the United Kingdom from nearly every period. Mark developed a specialisation in geomatics while at Oxford Archaeology and was the Geomatics Officer at the Archaeology Institute, University of the Highlands and Islands where he led and developed the geomatics and marine archaeology capacity of the Institute. He also undertook marine archaeology projects and wreck condition assessments and produced marine Desk Based Assessments, Environmental

Impact Assessments and Environmental Statements for a range of clients and development types.

2.6 Ocean Ecology Limited

Ocean Ecology Limited (OEL) are a marine ecological consultancy that specialise in providing marine ecological surveys, analysis and consultancy services to feed into regional and national monitoring programmes, as well as EIAR's. Their survey capabilities range from seabed imagery collection using drop down / towed camera systems, grab sampling, trawling and plankton sampling as well as surveying of the intertidal zone via our hovercrafts and Unmanned Aerial Vehicles (UAVs), each of which have been performed for various port, harbour and marina projects throughout the UK. With specific expertise in assessing and monitoring benthic and epibenthic communities and Annex I habitats.

2.7 Tracks Ecology

Tracks Ecology is led by James Bunyan who became a freelance ecological consultant in 2014. James has over fifteen years ecological experience working within both the academic and commercial consultancy sectors working on a wide range of research and development projects requiring high quality ecological surveys.

He has worked on a significant number of projects involving Ecological Impact Assessments for wind farms, single turbine projects and other development schemes including biomass, hydro-electric, housing, transmission and Building Research Establishment Environmental Assessment Methods (BREEAM).

James' expertise is centred on protected species survey and management including bats, badgers, great crested newts, otter, water vole and reptiles and he holds Scottish Natural Heritage 'survey' licences for bats and great crested newts. He has extensive experience in initial baseline assessments and focused protected species surveys along with skills in impact assessment, mitigation, habitat management and enhancement strategies. In addition he is a UAV pilot, regularly utilising aerial photography to inform ecological assessments.

As a full member of the CIEEM. James applied his knowledge to process and interpret UAV data to provide a Phase 1 Habitat assessment to inform the Terrestrial Ecology chapter of the EIAR.

2.8 Pell Frischmann

Pell Frischmann is a multi-disciplinary and international consultant engineering company. Working across infrastructure, buildings, and regeneration, it is known for diverse engineering expertise and its understanding of its client's commercial and technical needs.

Employing over 900 professional engineers, it has 15 offices in the UK and does work around the world, from India to Nigeria, and from the Americas to Middle East, covering sectors including Rail, Traffic & Transportation, Building Structures & Services, Environment & Sustainability, Aviation, Water, Infrastructure, Highways, Fire, and Flooding. Its transport and road design services and skills include the planning and design of major transport infrastructure projects, landmark buildings and transport interchanges as well as local transport issues and the assessment of individual development sites.

Gordon Buchan is a highly experienced Transport Planner, having worked on a diverse number of projects across the UK and Ireland. Gordon specialises in private sector development and has undertaken Transport Assessments (TAs) for a number of successfully completed projects ranging from small housing developments through to large scale, regionally important retail outlets. These projects have included the private sector, local government and national government agencies.

Gordon has been involved in the preparation of numerous travel plans, access studies, public transport briefings and signing strategies. In addition to this experience in actually preparing assessments, he has also spent considerable time auditing TAs for local authorities, allowing Gordon an overview of the whole development control process from both sides of the fence.

2.9 Oxford University Innovation Limited

Oxford University Innovation is a wholly-owned subsidiary company of the University of Oxford, overseen by a board drawn from senior University staff and external members with broad industry experience. With experts drawn from more than 50 departments across the University's four academic divisions, its consulting projects range from individual academics providing advice to solve a specific problem through to multidisciplinary teams working with clients and third parties to solve complex multifaceted problems.

Oxford University Museum of Natural History was established in 1860 to draw together scientific studies from across the University of Oxford. Today, the award-winning Museum continues to be a place of scientific research, collecting and fieldwork, and plays host to a programme of events, exhibitions and activities for the public and school students of all ages.

Elsa Panciroli is a Leverhulme Early Career Research Fellow at the museum, supported by the John Fell Fund. Prior to this, she was a researcher at the University of Oxford Earth Sciences department. She is also an Affiliate Researcher at National Museums Scotland, where she previously completed her PhD on Scottish Jurassic mammal fossils from the Kilmaluag Formation on Skye. This was undertaken in joint partnership with the University of Edinburgh as part of the National Environmental Research Council Doctoral Research Partnership (NERC DTP). She carried out her undergraduate degree in Environmental Science at the University of the Highlands and Islands, before embarking on an MSc in Palaeobiology at the University of Bristol, focusing on the ecomorphology of the carnivoran ankle and supervised by Professor Christine Janis.

3 Glossary

Acronym	Definition
BREEAM	Building Research Establishment Environmental Assessment Methods
CIEEM	Chartered Institute for Ecology and Environmental Management
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
NERC DTP	National Environmental Research Council Doctoral Research Partnership
NGO	Non-Governmental Organisation
OEL	Ocean Ecology Limited
SCT	Staffin Community Trust
TA	Traffic Assessments
UAV	Unmanned-Aerial Vehicles

Appendix C.1: Scoping Summary Table

Wallace Stone
Consulting Civil Engineers

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Scoping Report

Staffin Community Harbour Redevelopment Project

Wallace Stone
Consulting Civil Engineers

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Document Control

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Contents

1 Introduction

The nature and scale of the proposed Staffin Community Harbour (SCH) development is such that it falls under Schedule 2 paragraph 1(e) and 10(m) of the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and the Town and Country Planning (Environmental Impact Assessment) (Scotland) 2017. Having considered the location and characteristics of the Proposed Project, the applicant has decided that an Environmental Impact Assessment Report (EIAR) is to be submitted in support of the marine licence and planning consent applications.

Due to the project timeline a formal scoping opinion was not sought from Marine Scotland or the Highland Council. However, this Scoping Report was produced to allow the authors of the EIA to understand where to focus their efforts, and to provide the underpinning reasoning as to why certain aspects were scoped out of the EIA process.

Information on the proposed development is provided to give an understanding of the whole proposal; construction, operation and reinstatement. The environment and potential impacts are then discussed on a subject by subject basis, to assess the baseline, recognise potential construction and operational impacts, identify appropriate mitigation techniques (where necessary) and to review the need for additional baseline data collection and assessment of potential significant effects. Section 2 of this document provides information about the development; Section 3 outlines the consenting, permitting and licensing process for the proposed development; Section 4 to 15 consider each of the EIA topics in turn, a summary of proposed topics for consideration is provided in Section 16.

2 Proposed Development

2.1 Project Background

The Staffin Community Trust (SCT) ~ Urras an Taobh Sear was established in 1994 by the local community determined to tackle the challenges faced by the rural district, on the Isle of Skye, in the Scottish Highlands. SCT works with, and for the community, which has crofting and Gaelic at its heart.

The original slipway was commissioned in the early 1900's by the Congested District Board. Using a local labour force, a stone built slipway was created along with a store to allow freight to be unloaded and stored at Òb nan Ron, Garafed. Òb nan Ron is the Gaelic term for Bay of Seals, which is the name of the bay where the slipway is located (Ports and Harbours of the UK, 2021).

In 2000, The slipway underwent upgrades which included the construction of a breakwater. The upgraded Staffin Community Slipway was opened by the HRH The Princess Royal. It is used by the local community to facilitate fishing, fish farming and recreational activities.

While the slipway has sufficiently served the community, the layout of the current facilities lacks sheltered berthing and has a slipway that is tidally restricted, affecting boat launching capabilities. The existing slipway has a gradient of 1:20 which restricts use to between mid and high tide. In addition, it is too narrow to allow for launching of larger boats and landing crafts. Currently boats, that are not removed from the water daily, are moored outside of the bay

between the slipway and Staffin Island (located approximately 600m north of the existing slipway). Small tenders are used to ferry people from the slipway to their boats and back. However, when the sea is too rough, the tenders cannot leave slipway area, preventing access to anchored vessels.

2.2 Project Description

The proposed development comprises of the components described in Sections 2.2.1 to 2.2.9. The proposed general layout is depicted in JG4710.

2.2.1 Breakwater

One of the main aims of the project is to create sheltered berthing. This requires the construction of a breakwater. The existing breakwater will need to be dismantled and the material will be used to create a new breakwater approximately 20m to the east of the existing slipway. The breakwater will be accessible by vehicles and pedestrians along the top of it.

2.2.2 Pontoons

Currently, there is limited berthing at the existing slipway. It is therefore proposed that pontoons with approximately 15 large berths and 15 small berths installed to allow for additional berthing. The pontoons will be accessible from the parking area over the new break water with bridge structure linking the pontoons to the breakwater.

2.2.3 Slipway

As discussed in Section 2.2 the existing slipway is limited by the tides due to the gradient of 1:20. A new slipway has therefore been designed to be shorter, wider and steeper to allow use during both low and high tide and allow for the launching of larger crafts. Access to the new slipway will be across the top of the breakwater. The existing slipway will be left in situ.

2.2.4 Land Reclamation

To increase the area available for development, an area of 2,022m^2 will be reclaimed to provide space for buildings, parking and laydown. As part of the proposed Harbour development, formal parking for both public use as well as space for cars and boat trailers will be required. The design includes for 38 formal parking spaces.

2.2.5 Buildings

The design includes for an office for the Harbour Manager and toilets, available to users of the proposed Harbour and the general public. Onshore storage units for boats, equipment and other maritime related items have been included in the design. The design will allow for approximately seven single storey storage units of varying sizes up to 60 square meters, with a height of up to 4.1m. Due to the aesthetic sensitivities of the area, the storage unit design and the buildings design will be visually inspired by local and maritime vernacular.

2.2.6 Utilities

In order to support the proposed buildings discussed in Section 2.2.4, supporting infrastructure such as water, electricity and a foul drainage system will need to be installed on site. A spring is located about 200m south of the Harbour development (Grid Reference: 14942 86802), which is currently used to feed water to the tap located behind the existing boatshed. Water to the development will continue to be supplied from the spring with an abstraction

rate of $2m^3$/hour. Water will be stored within a $4m^3$ water tank, which will be installed to the rear of the stone shed.

Electricity will be distributed to the Site through the installation of a substation, connected to the grid by Southern and Scottish Electricity Network (SSEN). Finally, a septic tank will be installed for foul effluent treatment and discharge through an outfall pipeline into the marine environment.

In addition, two bunded oil storage tank for refuelling of boats will be installed, the capacity will be confirmed within the EIAR.

2.2.7 Access Roads

Access to the SCH will be via the existing access minor single-track road, which may require some minor upgrades.

2.2.8 Borrow Pit

In order to construct the new breakwater and to extend the existing hardstanding, rock armour will need to be sourced. It is therefore proposed that the previously worked quarry at Lealt (approximately 7 km south of the proposed Harbour) is re-opened for rock extraction, to act as a borrow pit for the proposed SCH development.

2.3 Location

2.3.1 The Proposed SCH Development

The proposed SCH 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 (Drawing 73.01.B). 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. The SCH Development falls within the administrative area of The Highland Council. Refer to Drawing 73.04.01 for the development area.

2.3.2 Borrow Pit

Lealt is a previously worked quarry, lying between the A855 road and the east coast of the Trotternish Peninsula, it is to the north of Lealt Gorge, grid reference NG 51879 60595 (Drawing 73.01.B) Previous workings have left a back-wall, some 6m in height adjacent to the road with a fairly level, slightly domed area of quarry floor, extending eastward towards the coast, there is a second sinking of around 6m to the east of the main floor level. 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 quarry 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 overburden. Access to the quarry is directly from the A855, to the north of the access, and separate egress, for Lealt Falls car park, from which a path leads to viewpoints for Lealt Falls and the old Diatomite furnace and mill on the shore at Inver Tote. The quarry workings are to the north of the access.

2.4 Project Phases

2.4.1 Construction

2.4.1.1 Harbour Development

Construction of a new breakwater

In order to construct the new breakwater, the existing breakwater will need to be dismantled and material removed and stockpiled for use in the construction of the new breakwater further east (approximately 20m) of the existing slipway. The removal will include dismantling the existing 'toe' of the existing breakwater and slipway and removal of the steel berthing structure. In order to develop the new breakwater, rock armour will be extracted from the Borrow Pit, located in Lealt. Construction of the breakwater will be done by placing inner rockfill directly on the seabed to form the base of the breakwater and provide stability. A layer of secondary rock armour will be placed over the inner rockfill, followed by primary rock. Along the first section of rock armour, tarmac will then be poured along the top of the breakwater to create the 5m wide access track to the slipway. The primary rock armouring will extend up higher than the access track as a safety measure. Along the second section of the breakwater (i.e. between the slipway and pontoons), tarmac will be poured to create a narrow footpath allowing pedestrians to access the pontoons.

Pontoons

The new pontoons will be brought to site in sections. Each section will be craned into the water from the newly created reclaimed area and toed into place utilising a boat and attached to temporary mooring lines. Concrete anchor blocks, located on the breakwater and on the seabed along the parameter of the pontoons will be installed. The sections of pontoon will be bolted together using rubber connections. The bridge, connecting the pontoons to the breakwater will be attached to a section of the pontoon prior to be placed within the water. The boat used to toe the pontoon sections will be equipped with a crane arm, which will lift the bridge into place onto the breakwater.

Slipway

The slipway will be a reinforced concrete structure, which will be constructed in-situ. Construction will be undertaken by installing shuttering, placing rebar within the formwork and then pouring pre-mixed concrete. To ensure that the pre-mixed concrete is suitable for use within the marine environment, additives will be added to the concrete to ensure durability of the concrete.

Land Reclamation

The extension of the existing hardstanding will be achieved through land reclamation using rock sourced from the Borrow Pit. This will include rock armouring to protect the seaward edges (if necessary) and infilling to reclaim and re-profile the area. Gravel will be placed as a surfacing of the reclaimed area. The gravel will be compacted to create a strong impermeable surface.

Buildings

The toilets and Harbour Managers office will be constructed by in-situ pouring a concrete foundation, laying concrete blocks for the walls with a sinusoidal metal profiled roof cladding. Vertical board on board cladding will be used at the front of the building with cement dash on the sides and back of the building. A Solar Photovoltaic (PV) array will be installed on the south facing roof.

Utilities

In order to get water from the spring to the Harbour development, a trench will be dug to remove the existing old plastic pipe, which is in poor condition and approximately 185m of 32mm diameter medium density polyethylene (MDPE) pipe will be laid from the Harbour development to the spring. A stock proof spring catchment chamber will be constructed over the spring. A pump will be installed in one of the new storage sheds, along with a $4m^3$ water storage tank.

A substation will be installed on site to provide power to the Harbour development. The substation will be installed as a modular unit however, new high voltage cable will need to be installed by SSEN, connecting the substation to the grid.

Sewage discharge will be from a septic tank through an outfall pipeline into the sea. A $5m^3$ septic tank will be installed underground, which will connect to the toilet facilities. A 6 inch plastic soil pipeline will then be connected to the septic tank and will run underneath the surfacing of the proposed breakwater and be discharged below the MLWS. This is however, subject to a simple licence from SEPA in terms of The Water Environment (Controlled Activities)((Scotland) Regulations 2011 (as amended) (CAR).

The oil storage tanks will be delivered to site and installed onsite in accordance with General Binding Rules (GBRs) 28 of the CAR.

Access Road

While no major improvements will be made to the existing access road, edge repair and patching of holes maybe required. Edge repairs require the excavation of the edge road and verge, placing suitable granular fill down and compacting it. Tarmac is then poured onto the compacted area. Patching of the holes involves the pouring of tarmac into the hole to fill it and then pressing it with a roller.

2.4.1.2 Borrow Pit

The proposal is to re-establish workings at Lealt Quarry, as a borrow pit for the project, providing hard rock for use in the proposed development, during the construction phase. The extraction process will require the blasting of rock to produce a range of product size, ranging from crushed aggregate for general fill, to 2 - 4 tonne blocks for use as primary armour stone for breakwater development. As primary armour stone only represents a small percentage of blast material, it is anticipated that up to 170 000 tonnes of rock will have to be blasted, to attain the required products. Whilst the main blasting and processing works could be completed within a period of 6 - 8 weeks, the loading and despatch of crushed rock and armour stone are likely to be undertaken over a longer period to match the construction programme. It is likely that blasting, and processing, would therefore be undertaken intermittently, for three or four periods of 2 - 3 weeks, as the Borrow Pit is developed.

In light of the potential for future use of Lealt Quarry, reinstatement of the site will ensure safe and stable slopes with a graded floor level. Any blasted and/or processed materials, which are not required for the Harbour development, may be retained in a tidy state, as stockpiles within the excavation void. The existing informal peripheral pathways will be retained. This approach has been agreed in consultation with the landowner. A reinstatement proposal will be developed, which will ensure that the quarry is left in a stable and safe condition.

2.4.2 Operation

As the proposed development constitutes an upgrade and expansion rather than a new development, the general nature of the site will not change. The aim is to improve on existing operations and create a functional multiuser harbour to support the local community. Once the Harbour is operational it will be able to accommodate leisure vessels, tourism orientated boats as well as boats and larger landing crafts associated with the fish farms and creel fishing industry in the area. With the installation of the pontoon, boats can now berth for a longer period of time rather than daily launching activities for 12 months of the year.

From a commercial point, the surrounding fish farms will have valuable infrastructure to launch boats, store equipment and park commercial vehicles. With boats being able to moor in the safety of the Harbour, staff will no longer routinely need to be ferried in the small dingy to the offshore mooring points.

Maintenance dredging is unlikely to be required as part of maintenance activities. Maintenance activities will however, involve the periodic replacement of the decking on the pontoon and access bridge and replacing fenders.

The buildings will be subject to routine maintenance and the sceptic tank will be emptied by an appropriately licenced contractor as required.

2.4.3 Demolition / Reinstatement

Due to nature of the proposed development, there are no future plans for the discontinued use of the Site. Therefore, it is not considered necessary to plan for demolition and reinstatement works for proposed Harbour development.

3 Consenting Permitting and Licensing Process

3.1 Marine Licence

Under the Marine (Scotland) Act 2010 a number of activities listed in Part 4, Section 21 of the Act require a Marine Licence issued by the Marine Scotland Licensing Operations Team (MS-LOT). This includes any activity where the project intends to do any of the following below the Mean High-Water Springs (MHWS):

- Deposit or remove substances or objects in the sea either on or under the seabed;
- Construct/alter/improve any works in or over the sea or on or under the seabed;
- Remove substances or objects from the seabed; or
- Dredging activity.

As such a marine construction licence application will be submitted for the construction of the breakwater, pontoons, slipway and land reclamation elements situated below MHWS.

3.2 Planning Permission

Under the Town and Country Planning (Scotland) Act 1997 as amended, any type of development, i.e. carrying out of building, engineering, mining or other operation in, on, over or under land, or the making of any material change in the use of any building or other land above the MLWS will require planning consent. As such the proposed development will require planning permission for parts of the slipway, breakwater and land reclamation above MLWS

as well as the carparking, buildings and any road improvement works. The Borrow Pit will also require planning permission.

3.3 Pre – Application Consultation

The Marine Licensing (Pre-application Consultation (PAC)) (Scotland) Regulations 2013 as amended, prescribe the marine licensable activities that are subject to PAC and in combination with the Marine (Scotland) Act 2010 and sets out the nature of the PAC process. The proposed development falls within Regulation 4(d) as a construction activity within the marine area exceeds 1,000m^2 therefore requiring the project to go through a PAC process compliant with marine legislation.

Due to the scale of the proposed development (less than 2 hectares), it is not deemed a 'Major Development' in terms of Regulation 2(1) of the Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009. The project therefore is not required to go through the PAC process compliant with the terrestrial process laid out in the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2008.

3.4 Environmental Impact Assessment

Due to the nature and scale of the proposed development, the development falls under Schedule 2 paragraph 10(g) and 10(m) of the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and the Town and Country Planning (Environmental Impact Assessment) (Scotland) 2017. Having considered the location and characteristics of the proposed development, the applicant has opted to submit an Environmental Impact Assessment Report (EIAR) with the Marine Licence and Planning Consent Applications and hence has not sought a screening opinion.

3.5 European Protect Species Licence

If it is determined that the construction activities associated with the proposed development will likely affect European Protected Species (EPS) listed under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended); which includes dolphins, harbour porpoises and European otters; an EPS Licence will be required. It is recognised that an EPS licence will only be granted if it is proved that:

1) *The project is on Imperative Reasons of Overriding Public Interest;*
2) *There are not satisfactory alternatives; and*
3) *The proposed action must not be detrimental to the maintenance of the species at 'favourable conservation status'.*

Depending on the construction techniques there is a potential to have disturbance effects on cetaceans and otters, hence EPS licenses may be required.

3.6 Habitat Regulation Appraisal

An appropriate assessment (AA) is part of the Habitats Regulations Appraisal (HRA) process, to be undertaken by the competent authority. It is required when a plan or project potentially affects a European Natura site. The Natura sites' network in the UK consists of Special Protection Areas (SPAs) and Special Areas of Conservation (SAC). An AA must demonstrate that there will be no adverse effect on site integrity. Should this requirement not be satisfied, a project would only receive consent if:

(1) Imperative Reasons of Overriding Public Interest are proved; and
(2) There are not satisfactory alternatives.

The proposed development will intersect the Inner Hebrides and the Minches SAC and hence is assumed to require an appropriate assessment. In addition, there is the potential for the development to cause indirect effects on several adjacent Natura sites. The intent is to provide appropriate information within the EIAR to inform any AA's that many need to be undertaken by Marine Scotland and The Highland Council as the competent authorities in this case.

3.7 Water Framework Directive

The Water Framework Directive's (2000/60/EC) primary purpose is to create a framework to protect groundwater, coastal waters, transitional and inland surface waters (European Parliament, 2000). The framework details multiple aims which include:

- Prevention and protection of aquatic environments and enhancement of their ecosystem status in regard to the water needs of wetland and terrestrial ecosystems which rely upon aquatic environments;
- Enhancement of aquatic environments through the introduction of measures to reduce discharges, emissions, and losses of hazardous substances; and
- Continuation of progressive reduction of groundwater pollution and further prevention of its pollution.

Under the WFD, member states are to achieve "good ecological status" of their coastal, transitional, and inland waters. Protection and restoration of member states' ground waters to maintain the dependent surface water and terrestrial ecosystems are also required. In Scotland, the Water Environment and Water Services (Scotland) Act 2003 transposed the Directive into Scottish Law.

The Directive also requires that classified waterbodies are given legal protection. In Scotland this was incorporated into law under the Environmental Liability (Scotland) Regulations 2009, making it an offence to adversely affect a classified waterbody so that its status or potential under the WFD is deteriorated.

4 Air Quality

4.1 Baseline

The proposed development is not within an air quality management zone. There is only one Air Quality Management Area in the whole of the Highland Council Area (IQAir, 2021) 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 good based on the rural, coastal location.

4.1.1 Harbour Development

The nearest dwellings to the Harbour development are located in the small formal residential area of Stenscholl, located approximately 500m southwest of the proposed development, there are private residential properties approximately 700m and 1.11km of north west of the Site respectively. The harbour is utilised daily, however people are not present for long periods

of time. In accordance with the Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2014) 'human receptors' are locations where a person or property may experience the adverse effects of airborne dust or dust soiling human receptors. There are none of these within 350m of the main construction area or within 50m of the first 500m of the access road from the site. However, there are residential properties adjacent to the access road. As discussed in Section 6.1 and 6.2.1 there are no ecological receptors as defined within the afore mentioned guidance within 50m of the proposed development.

4.1.2 Borrow Pit

The nearest dwellings to the Borrow Pit are located just under 500m southwest of the Borrow Pit. There are additional private residential properties 730m to the north and 980m west of the Borrow Pit. There is a public footpath close to the Borrow Pit, however as people are walking past the site they are not in the local for long periods of time. There are no identified residential receptors within 400m of the boundary of the site; or 50m of the route used by quarry vehicles up to 500m from the site entrance. There are no sensitive ecological receptors within 50m of the boundary of the site or 50m of the first 500m of the route used by quarry vehicles.

4.2 Potential Construction Impacts

4.2.1 Harbour Development

4.2.1.1 Dust

Dust has the potential to impact on both vegetation and human health. In humans, dust particulates can be inhaled and irritate the nasal passage or be blown into eyes. It can also be a nuisance by coating surfaces, such as cars and windows with dust. Dust can cover the leaves of plants, preventing photosynthesis.

During the construction phase, it is anticipated that there may be short-term, localised dust generation from the small area of vegetation clearance and infilling activities. As outlined in Step 1 of the Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2014) an assessment of construction dust for activities around the harbour are not required due to the lack of human and ecological receptors in the vicinity of potential dust sources.

Any improvement works on the access road are unlikely to give rise to noticeable sources of dust hence there will are no effects predicted on the human receptors adjacent to the road.

4.2.1.2 Green House Gas Emissions

There will be Greenhouse Gas (GHG) emissions associated with the site preparation and construction of the proposed development through the burning of fossil fuels (vehicle emissions, machinery emissions). In addition, the construction activities require materials which either have to be sourced from the ground or manufactured. The extraction or manufacturing of the material as well as transporting the material to site will emit GHG's.

4.2.2 Borrow Pit

4.2.2.1 Dust

The primary activity for the extraction of rock is blasting, resulting in dust and small rock particulate. Rock will then need to be loaded into trucks and transported to the Harbour development. Without mitigation small particulates could be tracked– out of the Borrow Pit and onto the public roads, causing potential dust issues. The scale and short-term nature of operations, coupled with the distance to residential receptors mean it is unlikely that there will be significant impacts on residential receptors. However, recreational receptors could utilise facilities close to the Borrow Pit and have their enjoyment of their visit reduced.

4.2.2.2 Green House Gas Emissions

There will be GHG emissions associated with the site preparation and blasting activities at the Borrow Pit through the burning of fossil fuels (vehicle emissions, machinery emissions).

4.3 Potential Operational Impacts

4.3.1 Dust

Once construction has been completed and operations at the Harbour commence, the entire operational site will be surfaced hardstanding or compacted gravel. Therefore, there are no anticipated impacts associated with dust.

4.3.2 Green House Gas Emissions

The aim of the Harbour development is to allow for sheltered berthing within Òb nan Ron, Staffin, encouraging a variety of users both leisure and commercial to make use of the Harbour. It is therefore anticipated that there will be a greater number of boat users making use of the area, increasing the amount of GHG emitted compared to existing operations.

4.4 Mitigation Measures

4.4.1 Harbour Development

The reuse of rock armour from the current slipway is primary mitigation minimising GHG emissions associated with construction.

Table 4.4.1 provides secondary mitigation measures proposed for the Harbour development during the construction of the project, to minimise effects.

Table 4.4.1: Dust and GHG Emissions Mitigation Measures

Phase	Aspect	Mitigation
Construction	Dust	• Dust checks will be carried out during construction works, if it is becoming an issue appropriate suppression measure e.g. dampening, will be employed.
Construction	GHG	• Plant and vehicles associated with the construction activities will be well maintained. • The intrinsic GHG cost of materials and associated transport to site, to be considered during procurement.

4.4.2 Borrow Pit

The use of a local Borrow Pit provides primary mitigation for GHG emissions and forms part of the project strategy to minimise carbon emissions by sourcing local material, reducing the distance the rock material needs to be transported.

Table 4.4.2 provides secondary mitigation measures that will be implemented at the Borrow Pit during construction, to minimise effects on air quality.

Table 4.4.2: Dust and GHG Emissions Mitigation Measures

Phase	Aspect	Mitigation
Construction	Dust	• A Site Dust Management Strategy in line with PAN 50 Annex B Guidance will be incorporated into the Construction Environmental Management Document (CEMD).
Construction	GHG	• Plant and vehicles associated with the operational activities will be well maintained. • Stationery vehicles will be requested to switch off engines while waiting.

4.5 Proposed Environmental Impact Assessment

Taking account of the lack of dust sources associated with Harbour development construction and access road improvement works; the distance to receptors of all construction activities it is proposed dust is **scoped out** of the EIA for the Harbour development.

Due to the nature of the operations at the Borrow Pit, air quality, namely fugitive dust emissions will need to be assessed further. It is therefore proposed that dust effects are **scoped into** the EIA for the Borrow Pit. In addition, a Site Dust Management Strategy in line with PAN 50 Annex B will be compiled and included within the proposed mitigation.

Steps have been identified to minimise GHG emissions associated with construction activities, the amounts expected to arise will not be significant in regional or national terms. A detailed Carbon Calculation is not deemed proportionate or necessary, however steps will be taken throughout the design and construction to minimise releases where practicable.

While there is anticipated to be an increase in GHG emissions resulting from additional boats utilising the Harbour, the amount will be negligible due to the limited number of berths provided. Therefore, it is proposed that GHG emissions are **scoped out** of the EIA for the construction and operational phases of the project for both the Borrow Pit and Harbour development.

The mitigation measures outlined in Section 4.4 will be included in the Schedule of Mitigation (SoM) in the EIAR to ensure they are successfully implemented.

5 Archaeological and Cultural Heritage

5.1 Baseline

A preliminary review of the following datasets has been undertaken in order to identify potential marine and terrestrial archaeological assets that may be present within the Site (including the Harbour and Borrow Pit development areas):

- National Record for the Historic Environment (NRHE) as held by Historic Environment Scotland (HES);
- For designated and non-designated terrestrial and marine heritage asset data, including Canmore Maritime (PastMap, 2021);
- National Map Library (National Map Library, 2021):
    - For old Ordnance Survey maps (1st & 2nd Edition, small- and large-scale), pre-Ordnance Survey historical maps, pre hydrographic Office (HO)/United Kingdom Hydrographic Office (UKHO) charts and historic HO/UKHO charts.
- United Kingdom Hydrographic Office (UKHO) Marine Data Portal:
    - For United Kingdom Hydrographic Office (UKHO) Register of Wrecks.

5.1.1 Harbour Development

No maritime or marine finds or remains have been recorded in close proximity to the Staffin Slipway. No recorded wreck sites are located in close proximity to the Staffin Slipway although there are recorded losses of ships and wreck sites further to the west at Staffin Bay and offshore of Staffin Island. This does not rule out the possibility that hitherto unknown wrecks or archaeological features may be located within the proposed Harbour development.

It should be noted that dinosaur footprints have been recorded close to Staffin Slipway at An Corran beach, roughly 500m to the northwest of the area of the existing slipway; and two shell middens, one Scheduled and one non-designated, have also been found further inshore (SM7848 & NRHE: NG46NE 19). Lithic sites are also known in the area. It is possible that such remains may be present within the Site.

There are no designated heritage assets within the proposed Harbour development. The Scheduled Monument Garafad, depopulated settlement, Kilmuir (SM3510; NRHE NG46NE 9) a post-medieval depopulated township is located to the south and the Scheduled Staffin House, shell midden 1050m NNE of (SM7848) is located to the north of the proposed Harbour development, to the east of a non-designated shell midden (NRHE: NG46NE 19).

There are non-designated heritage assets within the proposed Harbour Development. The extant slipway and storehouse (NRHE: NG46NE 36; HER: MHG42765 & MHG35159) and the remains of a stone built naust (boat shelter) (NRHE: NG46NE 37; HER: MHG35160). These assets are located at the southern end of the proposed Harbour development.

In the wider area prehistoric funerary, ritual and activity remains and post-medieval/ modern residential and communication remains have been identified.

Historic maps indicate that the area has been located in an agricultural, sparsely populated landscape in the past and record the proposed Harbour development within an area known as Garrafad, associated with the Scheduled township and a later township also known as Staffin.

5.1.2 Borrow Pit

There are no designated heritage assets in the vicinity of the proposed Borrow Pit.

There are six non-designated heritage assets to the south of the proposed Borrow Pit. These assets include a 19th and 20th century Diatomite Works (NHRE: NG56SW 21 & NG56SW 21.01; HER: MHG37187 & MHG37188) which includes a quarry, house, building and chimney stack; a tramway (HER MHG44711), constructed for the Works; the location of three sheds (NHRE: NG56SW 21.03) associated with the Works ; a house (NHRE: NG56SW 21.02 & HER MHG37189), also recorded as the "managers house" associated with the Works, and a post-medieval fishing station (NHRE: NG56SW 27). In the wider area a non-designated enclosure and post-medieval crofting township are recorded.

Historic maps record the proposed Borrow Pit in unimproved coastal moorland to the north of a pier at two buildings annotated "Inver Tote "in a sparsely populated coastal landscape.

5.2 Potential Construction Impacts

5.2.1 Harbour Development

The construction of the proposed breakwater, pontoon berths and the slipway has the potential to directly impact marine heritage assets. Whilst no known heritage assets have been identified in this area, there is the potential for hitherto unknown remains to survive.

The construction and upgrading of the roadway, parking and harbour facilities have the potential to impact on known and hitherto unknown terrestrial archaeological remains. Remains in this area are likely to date to the prehistoric or post-medieval periods.

5.2.2 Borrow Pit

The proposed Borrow Pit is located within a former Diatomite Works. There is the potential for the proposed development to directly impact the surviving 19th and 20th century remains associated with the Works as well as upon hitherto unknown remains.

5.3 Potential Operational Impacts

Potential operational impacts are largely limited to the proposed development's impact on the setting of heritage assets.

5.4 Mitigation Measures

Mitigation measures, which may include avoidance or minimisation of negative impacts will be put forward to address potential impacts upon known heritage assets.

5.5 Proposed Environmental Impact Assessment

Due to the nature and locations of both the Harbour and Borrow Pit, it is proposed that Archaeological and Cultural Heritage is **scoped in** to the EIA for the construction and operational phases.

The assessment presented in the EIAR will seek to establish the historic environment baseline for the Site to inform the assessment of impacts upon known heritage assets and to establish the potential for hitherto unknown remains to survive on the Site. Data will be gathered from the following data sources:

- Highland Council Historic Environment Record;
- The National Record of the Historic Environment (including GIS data sets);
- The National Library of Scotland Map Collection to allow for map regression;
- National Collection of Aerial Photographs, as maintained by HES;

All heritage assets designated or otherwise within 1km of the Site, including the areas of the proposed Harbour development and Borrow Pit, will be identified. A walkover survey will be undertaken of the both the Harbour area and the proposed location of the Borrow Pit to confirm the results of the desk-based research and to identified any hitherto unknown remains. Areas of previous disturbance will also be noted where this may have impacted upon the potential for archaeological survival.

Site visits will be made to designated heritage assets within the 1km Study Area to establish the current setting of the assets, how this contributes to their significance and thus enabling an assessment of potential setting impacts.

The EIAR will fully describe the baseline historic environment conditions, collating the results of desk-based and field visits.

The assessment will consider both the potential for direct impacts upon heritage assets, including buried or submerged archaeological remains, and the potential for impacts upon the setting of designated heritage assets within the surrounding area. In order to do, so the assessment will establish:

- The significance of heritage assets in question;
- The sensitivity of those assets to changes (either direct physical change or to changes to their settings);
- The magnitude of impacts;
- The level of effect and whether or not that effect is considered significant in EIA terms; and
- Impacts upon integrity of setting where Scheduled Monuments are concerned, in line with Paragraph 145 of the Scottish Planning Policy (SPP) (Scottish Government, 2020).

Where adverse effects are found, and if appropriate, the assessment will recommend mitigation proposals designed, in line with planning policy and guidance and best practice, to avoid, minimise or offset any such effects.

The assessment will include consideration of residual effects.

6 Biodiversity

6.1 Designated Sites

Statutory Designated Sites which are located within a 10km radius of the proposed development and the proposed Borrow Pit are detailed in **Error! Reference source not found.** and

Table 6.1.2: respectively.

Table 6.1.1: Statutory Nature Designated Sites relevant to the Harbour Development

Site	Designation	Distance Direction	Feature Category/Feature
Inner Hebrides and the Minches	SAC	Development within designated site	Designated for harbour porpoise (*Phocoena phocoena*) (Marine).
Trotternish Ridge	SSSI	2.2 - 13km NW to S	Designated for its bryophyte assemblage (Non-Vascular Plants), upland assemblage (Upland Habitat) and vascular plant assemblage (Vascular Plants).
Trotternish Ridge	SAC	3.5 - 13km NW to S	Designated for its alpine and subalpine calcareous grasslands, base-rich scree, dry heaths, high-altitude plant communities associated with areas of water seepage, montane acid grasslands, plants in crevices on base-rich rocks, species-rich grasslands with mat-grass in upland areas and its tall herb communities (Upland Habitats).
Valtos	SSSI	3.2km SE	Designated for its Bathonian (Earth Sciences) features.
Rubha Hunish	SSSI	9.1km NW	Designated for its maritime cliff (Coast) and Tertiary igneous (Earth Sciences) features.
Loch Cleat	SSSI	9.8km NW	Designated for its Quaternary of Scotland (Earth Sciences) features.

Table 6.1.2: Statutory Nature Designated Sites Relevant to the Proposed Borrow Pit

Site	Designation	Distance Direction	Feature Category/Feature
Valtos	SSSI	<100m E, SE, S	Designated for its Bathonian (Earth Sciences) features.
Inner Hebrides and the Minches	SAC	150m E	Designated for harbour porpoise (*Phocoena phocoena*) (Marine).
Trotternish Ridge	SSSI	3.9 - 9.5km SW to NW	Designated for its bryophyte assemblage (Non-vascular plants), upland assemblage (Upland habitat) and vascular plant assemblage (Vascular plants), as well as its Bathonian, Callovian, Kimmeridgian, Oxfordian, Tertiary Igneous, mass movement and mineralogy of Scotland (Earth Sciences) geological features.

Trotternish Ridge	SAC	3.9 - 9.5km SW to NW	Designated for its alpine and subalpine calcareous grasslands, base-rich scree, dry heaths, high-altitude plant communities associated with areas of water seepage, montane acid grasslands, plants in crevices on base-rich rocks, species-rich grasslands with mat-grass in upland areas and its tall herb communities (Upland habitats).
Rigg - Bile	SSSI	4.7km S	Designated for maritime cliff (Coast) and upland mixed ash woodland (Woodland).
Rigg - Bile	SAC	4.7km S	Designated for its maritime cliff (Coast), mixed woodland on base-rich soils associated with rocky slopes (Woodland) and vegetated sea cliffs (Coast).

6.2 Baseline

6.2.1 Harbour Development

6.2.1.1 Benthic Ecology

The Proposed Development is located within the vicinity of the existing Harbour that is currently in use. The water within the Harbour is shallow with maximum water depths of -3.3m Chart Datum (CD). The coastline within the immediate vicinity of the harbour development consists of rocky brown algal intertidal habitat. No specific information on the ecology or status of the benthic environment seaward of the MLWS has been found.

6.2.1.2 Fish

Various fish species are likely to be located in the waters surrounding the proposed development including the basking shark, which are commonly found off the west coast of Scotland throughout the summer months. Basking sharks are a protected species in Scotland afforded protection under Schedule 5 of the Wildlife and Countryside Act 1981, as amended. A search of the National Biodiversity Network (NBN) within 10km of the site revealed records for basking shark in the area (NBN, 2021).

The Stenscholl River, also known as the Kilmartin River, runs in a northerly direction around 800m west of the proposed Harbour development and is listed as a major salmon and sea trout fishery by the Skye District Salmon Board. The river enters Staffin Bay at a distance of 1.1km by sea from the proposed development. The River Brogaig flows around 1.7km west of the slipway and is also known to sustain smaller populations of these diadromous fish species. The mouth of this watercourse is also located in Staffin Bay, at a distance of 1.7km by sea from the slipway. There is therefore the potential for migrating salmon or sea trout to be present in the surrounding area.

6.2.1.3 Marine Mammals

The waters around the Isle of Skye and the Inner Hebrides are inhabited by numerous marine mammal species, including both cetaceans and seals. All cetacean species found in Scottish territorial waters are classed as European Protected Species (EPS) and are afforded protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). Seals, both grey (*Halichoerus grypus*) and common (*Phoca vitulina*) are protected under the Marine (Scotland) Act 2010 from killing, injury and taking. In addition, the Conservation (Natural

Habitats, &c.) Regulations 1994 as amended, prohibits certain methods of catching or killing seals and The Protection of Seals, Designation of Haul-Out Sites (Scotland) Order 2014, protects seals at significant haul-out sites.

Species regularly encountered in coastal waters include short-beaked common dolphin (*Delphinus delphis*), harbour porpoise (*Phocoena phocoena*), minke whale (*Balaenoptera acutorostrata*), bottlenose dolphin (*Tursiops truncatus*), Risso's dolphin (*Grampus griseus*), white-beaked dolphin (*Lagenorhynchus albirostris*) and killer whale (*Orcinus orca*) (NatureScot, 2020a). Of these species, harbour porpoise, short-beaked common dolphin, minke whale and bottlenose dolphin are commonly seen off the Isle of Skye. These species can be encountered year-round, however, peak numbers tend to occur during the summer and autumn months (Evans and James, 2016). A search of the National Biodiversity Network within 10km of the site revealed records for minke whale, common dolphin, harbour porpoise, killer whale, long finned pilot whale (*Globicephala melas*), grey and harbour seals, and otter. A search for designated seal haul-out sites within 10km of the proposed development using the National Marine Plan Interactive (Marine Scotland, 2020) revealed one site, Trodday, designated for breeding grey seals off the north tip of Skye, approximately 10km away.

Otters may be found within the marine environment as well as the terrestrial environment and are discussed further in Section 6.2.1.4.

6.2.1.4 Terrestrial Ecology

Vegetation and Habitats

An initial desk-based assessment was carried out to identify the habitats surrounding the Harbour development site using the Scottish Government's EUNIS Habitat Map of Scotland (Scottish Government, 2021a). The assessment showed that the area surrounding the proposed development is predominantly semi-improved acid grassland, which is used as common grazing. A rocky cliff face runs in a NW-SE direction around 150m inland of the slipway, at the foot of which lies boulders and small patches of scree. Relatively small areas of heathland and shrubland can also be found on the seaward side of the cliff feature to the south of the Harbour development, although these are small in nature and do not extend into the footprint of the development.

The Scottish Government's Carbon and Peatland 2016 Map (Scottish Government, 2021b) was also used to assess the potential for works to impact groundwater-dependent terrestrial ecosystems (GWDTE), as peat reserves may indicate the presence of wetland habitats. The map shows potential for Class 5 peat around 200m south-east of the harbour development and Class 1 (nationally-important) 1km to the south-west.

The relevant terrestrial designated sites in the vicinity of the Harbour development, detailed in **Error! Reference source not found.**.1, are mostly protected for their floral and geological features. Trotternish Ridge SSSI/SAC is designated for its rare upland vegetation communities and Rubha Hunish SSSI for the varied flora found within its maritime cliff habitats.

Protected Species

European otters (*Lutra lutra*) inhabit both coastal and riverine habitats in Scotland and are listed as EPS and are afforded protection under the Conservation (Natural Habitats, &c.) Regulations 1994, as amended. Otters are common along the coastline of western Scotland and the country has a high proportion of coastal populations (approximately 50%) that feed

exclusively at sea and are mainly active throughout the day (NatureScot, 2020b). Those inhabiting a riverine habitat tend to be active during dawn and dusk. The area around the Harbour development contains suitable habitat for otter and there are many records of the species along the coastline within 5km of the site (NBN, 2021).

No records of other protected mammals were found within a 5km radius of the proposed Harbour development (NBN, 2021). The habitats surrounding the development do not seem suitable to support bats and there are no obvious roost sites in the immediate vicinity. There are also no obvious flight lines such as watercourses or tree lines running through the site. Pine martens are present in small numbers on Skye but there are no areas of suitable habitat with potential connectivity to the proposed development site.

Ornithology

Under the Wildlife & Countryside Act 1981 (as amended) all wild bird species are protected during the breeding season, and those classified as Schedule 1 are granted further protection through special penalties year-round.

In total there have been 140 species of birds recorded within a 5km radius of the Harbour development, and over the last 10-year period 16 of those sighted are classed as Schedule 1 in Scotland (NBN, 2021). However, many of these sightings are non-breeding records and are likely to be fly-bys. A significant number of great northern divers (*Gavia immer*) have been recorded throughout the year in the area around the slipway and likely feed in the nearshore waters surrounding the development site. Corncrake (*Crex crex*) have also been sighted throughout the spring and summer months in grassland habitats within 5km of the slipway, although the last record is from 2014 and over 1km from the proposed development. Whimbrel (*Numenius phaeopus*) have also been recorded in the spring and summer months within 5km of the site, although these sightings have been towards the edge of this radius. There have also been numerous sightings of greylag geese (*Anser anser*) within 5km of the proposed development and there is known to be a resident population at Loch Mealt around 3km to the south.

In addition, numerous seabird species have been recorded in both areas over the last 10 years. These include black guillemot (*Cepphus grylle*), kittiwake (*Rissa tridactyla*) and razorbill (*Alca torda*). Although some of these records are from the spring and summer months during the breeding season, it is not clear from this desk study which species, if any, nest in the cliffs just inland of the Harbour development.

None of the protected areas within a 10km radius of the Harbour development have been designated for their ornithological features. However, the proposed works are within close proximity to a range of upland and coastal habitats that could potentially be used for nesting or foraging by a large variety of species. These could include wide-ranging Schedule 1 species including raptors such as the hen harrier (*Circus cyaneus*) and white-tailed eagle (*Haliaeetus albicilla*).

6.2.2 Borrow Pit

6.2.2.1 Terrestrial Ecology

Vegetation and Habitats

An initial desk-based assessment was carried out to identify the habitats surrounding the Borrow Pit site using the Scottish Government's EUNIS Habitat Map of Scotland (Scottish Government, 2021a). The assessment showed that most of the surrounding area consists of semi-improved grassland, although an extensive region of blanket bog is found around 100m north-west on the far side of the A855. Rocky cliffs extend north from the seaward side of the Borrow Pit and the River Lealt runs 200m to the south, flowing through the wooded Lealt Gorge before reaching the coast.

The Scottish Government's Carbon and Peatland 2016 Map (Scottish Government, 2021b) was also used to assess the potential for works to impact any GWDTE, as peat reserves may indicate the presence of wetland habitats. The map shows potential for Class 1 (nationally-important) peat reserves <100m to the north-west.

The relevant terrestrial designated sites in the vicinity of the Borrow Pit, detailed in

Table **6.1.2:**, are mostly protected for their floral and geological features. Trotternish Ridge SSSI/SAC is designated for its rare upland vegetation communities, whilst Rigg-Bile SSSI/SAC for the varied flora found within its maritime cliff and woodland habitats.

Protected Species

The coastal and riverine environments around the Borrow Pit contain suitable habitat for European otter and there are many records of the species within 5km of the site (NBN, 2021).

No records of other protected mammals were found within a 5km radius of the Borrow Pit (NBN, 2021). The Borrow Pit itself and the habitats immediately adjacent to it do not seem suitable to harbour any roost sites. There are also no obvious flight lines such as watercourses or tree lines running through the site, although the River Lealt 200m south may offer suitable foraging habitat. Pine martens are present in small numbers on Skye, and the closest areas of potentially suitable habitat to the Borrow Pit are the wooded gorge 200m to the south followed by the Tote Forest plantation 1km south.

Ornithology

In total there have been 113 species of birds recorded within a 5km radius of the Borrow Pit, and over the last 10-year period 14 of those sighted are classed as Schedule 1 in Scotland (NBN, 2021). However, many of these sightings are non-breeding records and some are likely to be fly-bys.

Whimbrel (*Numenius phaeopus*) have been recorded in the spring and summer months within 5km of the Borrow Pit, although these sightings have been towards the edge of this radius. There have also been numerous sightings of greylag geese (*Anser anser*) within the same radius and there is known to be a resident population at Loch Mealt around 4.2km to the north. In addition, numerous seabird species have been recorded in both areas over the last 10 years. These include black guillemot (*Cepphus grylle*), kittiwake (*Rissa tridactyla*) and razorbill (*Alca torda*). Although some of these records are from the spring and summer months during the breeding season, it is not clear from this desk study which species, if any, nest in the cliffs directly to the east of the Borrow Pit.

None of the protected areas within a 10km radius of the Borrow Pit have been designated for their ornithological features. However, the works at the Borrow Pit will be within close proximity to a range of upland and coastal habitats that could potentially be used for nesting or foraging by a large variety of species. These could include wide-ranging Schedule 1 species including raptors such as the hen harrier (*Circus cyaneus*) and white-tailed eagle (*Haliaeetus albicilla*).

6.3 Potential Construction Impacts

6.3.1 Harbour Development

6.3.1.1 Benthic Ecology

The construction of a breakwater, slipway and land reclamation will involve the depositing of materials on the seabed and will therefore result in the loss of benthic habitat. As discussed in Section 10, construction activities may give rise to risks of loss of containment of materials which could impact upon water quality. Benthic organisms are particularly sensitive to changes in water quality and hence could be impacted in event of a loss of containment.

6.3.1.2 Fish Ecology

The construction works could give rise to disturbance of fish present in the vicinity of the works due to the physical presence of machinery and personnel. There is also a chance of direct injury associated with the movement of plant and materials in the marine environment. Fish may also be affected by changes in water quality which could arise during construction, as discussed in Section 10.

The marine construction techniques being deployed are not particularly noisy and they are being carried out in shallow waters, as such underwater noise levels are not expected to be at a level that would impact upon Fish.

6.3.1.3 Marine Mammals

The construction works could also give rise to disturbance of marine mammals present in the vicinity of the works due to the physical presence of machinery and personnel. There is also a very small chance of injury associated with the movement of plant and materials in the marine environment. Marine mammals can also be affected by changes in water quality which as discussed in Section 10 could arise during construction.

The marine construction techniques being deployed are not particularly noisy and they are being carried out in shallow waters, as such underwater noise levels are not expected to be at a level that would impact upon Marine Mammals.

6.3.1.4 Terrestrial Ecology

Vegetation and Habitat

Construction on undeveloped land will inherently result in the loss of the natural habitat type already present and the associated vegetation. However, the onshore aspects of the development are to be sited on the existing hardstanding and the newly reclaimed intertidal area. It is therefore anticipated that the loss of terrestrial habitat will be negligible or very minimal and may only occur at the fringes of the acid grassland, a habitat type that is common and widespread throughout the west coast of Scotland.

Protected Species

The construction of the development will lead to the movement of plant and commencement of works in the terrestrial and marine environments. These activities may have the potential to interact with protected terrestrial species, notably otters. The level of disturbance this could result in will depend on the distribution and activity of the species in the area and whether features such as holts, couches or layups or present. There is a very small chance that construction activities could result in the direct physical injury of individuals, although it is more likely that disturbance could arise from sources of noise and light pollution associated with the works.

Ornithology

The potential for ornithological receptors to be impacted by the construction phase of the development will be determined by the exact species assemblage that utilises the habitats within and around the harbour. The level of interaction will also depend on how the area is being utilised by birds and whether it provides opportunities for foraging, breeding or commuting. Disturbance from noise and increased activity in the area associated with the works is the most likely impact on ornithological receptors. Light pollution also has the potential to impact on bird movement and feeding habits, although this may be minimal since the majority of construction activity is limited to daytime hours (7am-7pm).

6.3.2 Borrow Pit

Vegetation and Habitats

There is not expected to be a major loss of habitat around the Borrow Pit, as the site itself is a previously worked quarry and consists largely of bare rock of little ecological value. However, small areas of habitat, most likely acid grassland, may be removed if material is extracted from the edges of the existing pit.

Protected Species

If protected species, notably otters, are found to be present in the area the works at the Borrow Pit may lead to disturbance, which would be dependent on how the area is utilised by the species. If present around the Borrow Pit, the works are not anticipated to lead to a permanent loss of breeding or foraging habitat for protected species. However, the resumption of extractive operations may result in avoidance behaviour of the habitats during this period due to the increased activity, noise and vibration levels resulting from blasting.

Ornithology

The level of interaction between works at the Borrow Pit and ornithological receptors will be dependent on the species present in the vicinity and how they utilise the area. Disturbance from noise associated with blasting operations is anticipated to be the primary impact on ornithological receptors should they be present. Light pollution also has the potential to impact on bird movement and feeding habits, although this may be minimal since the majority of activity will be limited to daytime hours (7am-7pm).

6.4 Potential Operational Impacts

As the proposed development constitutes an upgrade and expansion rather than a new development, the proposed upgrades will promote more activity in terms of boat movements and frequency are expected to increase slightly. The habitat removal resulting from the extension of the slipway and construction of the new breakwater and pontoon will remain throughout the lifetime of the Harbour although as mentioned in Section 6.3 this area is minimal and in the case of the slipway, previously disturbed. Indeed, the rock armour that is to be installed along the new breakwater has the potential to create new habitat for protected species, potentially providing opportunities for otters to construct holts.

The only foreseeable impacts on fish and marine mammal receptors during the operational phase of the SCH development may arise from water quality issues caused by the accidental release of hazardous materials or litter into the marine environment. This may occur in the event of a spill or leak from the bulk fuel storage or during refuelling procedures.

The impacts associated with the operation of the proposed development in the terrestrial environment are deemed to be negligible. Operations are limited to the Harbour area and will not encroach on the surrounding vegetation and habitat areas. All operations will be undertaken on the hard surfaced and established areas and the formal parking will ensure that the public no longer need to park on the surrounding grazing land.

6.5 Mitigation Measures

Most of the onshore elements of the proposed SCH development will be constructed on the area of existing hardstanding or land reclaimed from the intertidal area and so the permanent loss of terrestrial habitats will be minimal.

Depending on the distribution of protected species found to be present around the harbour development and borrow pit, pre-construction surveys and species protection plans may be required.

Standard pollution prevention guidance will be adhered to prevent the occurrence of spillages and ensure the prompt administration of spillage procedures to limit the risk of water quality issues arising in the marine environment.

6.6 Proposed Environmental Impact Assessment

6.6.1 Benthic Ecology

Potential impacts on benthic ecology resulting from construction and operational activities will be **scoped in** to the EIA. Due to the lack of recent and specific baseline with regard to the benthic habitat, benthic habitat mapping will be undertaken as part of the EIA. This will take the form of benthic video transects for benthic analysis in line with SNH[1] Guidance on Survey and Monitoring, Benthic Habitats (Saunders, Bedford, Trendall, & Sotheran, 2011).

[1] Scottish Natural Heritage (SNH) has changed its name to NatureScot as of the 24th August 2020, the document being referenced was published prior to this date and therefore is still referred to as SNH in this context.

6.6.2 Marine Mammals

Potential impacts on marine mammals resulting from construction and operations will be **scoped in** to the EIA for the Harbour development. A desk study literature search will be undertaken by topic specialists to aid in identifying and assessing the marine mammals which may be utilising the proposed development area, and surrounding waters, including gaining information on population sizes, seasonal trends, foraging characteristics, and associated designated sites.

6.6.3 Fish Ecology

The potential impacts on fish ecology resulting from construction and operations will be **scoped in** to the EIA for the Harbour development. Due to the coastal nature of the proposed development, the potential for the construction activities could potentially result in negative impacts on fish species which/that spend part or all of their lifecycle in marine waters. A desk study literature search will be undertaken by a topic specialist to determine the potential impacts on fish.

6.6.4 Terrestrial Ecology

Habitat and Vegetation

The potential impacts on habitat and vegetation resulting from construction activities will be **scoped in** to the EIA for the construction phase, considering both the Harbour development and Borrow Pit sites. An extended Phase I habitat survey will be undertaken for the proposed Harbour developed and Borrow Pit. The Phase I habitat survey will provide a detailed description of habitats present and their respective distribution within the Survey Area. Phase I habitat survey is a standardised method of recording habitat types and characteristic vegetation, as set out in the Handbook for Phase I Habitat Survey – a technique for Environmental Audit (JNCC, 2010). As well as detailing phase 1 habitats, National Vegetation Classification (NVC) communities will be classified 'by eye' to provide more detailed information on the habitat distributions. The survey will also aim to identify any GWDTE that may need further consideration.

During the operational phase, the impacts on vegetation and habitat are deemed negligible, and it is therefore proposed that impacts on vegetation and habitat are **scoped out** of the EIA for the operational phase.

Protected Species

The potential impacts on protected mammals resulting from construction activities will be **scoped in** to the EIA for the construction phase, considering both the Harbour development and Borrow Pit sites. Due to the potential for otter to be present around both sites, an otter survey will be undertaken in accordance with the approach detailed by Scottish Natural Heritage "Protected Species Advice Note for Developers: Otter" and Chanin (2003). The survey will focus on the identification of otter field evidence e.g. sprainting, footprints, direct observation and evidence of places of shelter e.g. holts or couches. Such searches are dependent on safe access and where safe access is not possible i.e. steep banks/cliffs or within dense scrub then a limitation will be noted. Although unlikely, the extended Phase I habitat survey could reveal the potential presence of other protected species, and further relevant surveys may then be carried out if required.

During the operational phase, the potential impacts on protected mammals are deemed negligible, and it is therefore proposed that impacts on otters are **scoped out** of the EIA for the operational phase.

Ornithology

The potential impacts birds and raptors resulting from construction activities will be **scoped in** to the EIA for the construction phase, considering both the Harbour development and Borrow Pit sites. There is the potential that the areas around both sites could support habitat features that provide breeding, foraging or commuting opportunities for ornithological receptors. The coastal environments, sea cliffs and inland upland habitats are capable of supporting a wide range of species including a number of Schedule 1 species such as white-tailed eagle. As a result, breeding bird and raptor surveys will be conducted at the Harbour and Borrow Pit sites and the surrounding environments in order to identify the potential for any impacts.

During the operational phase, the potential impacts on birds and raptors are deemed negligible, and it is therefore proposed that impacts on ornithology are **scoped out** of the EIA for the operational phase.

7 Landscape, Seascape and Visual

7.1 Baseline

The Trotternish peninsula, of north-eastern Skye, is noted as being a highly sensitive landscape with, ordinarily, high visitor numbers. It is nevertheless a working landscape, with a traditional land and sea-based economy, alongside tourism. The project objectives align with this duality, in relation to providing for and managing visitors, as well as the continued economic use of the Harbour.

The landscape sensitivity is formally recognised, the north-eastern part of Trotternish being designated Trotternish National Scenic Area (NSA) and the remaining part of the peninsula being designated Trotternish & Tianavaig Special Landscape Area (SLA), now referred to as Local Landscape Area's (LLA).

The physical setting of both the Harbour development and the Borrow Pit sites are however well contained, limiting the scope for visual receptors.

The baseline condition forms the basis for assessment and in both cases the project seeks to develop existing features.

7.1.1 Harbour Development

At the Harbour there is an existing breakwater, formed with armour stone, and a concrete slipway. There is a coastal road to the site and with associated hardstanding. There are also various structures, the remains of historic stone buildings as well as temporary containers, associated with the current slipway facility.

7.1.2 Borrow Pit

The Borrow Pit is an established, albeit disused, quarry. The site has not been restored and although there is some vegetation within the quarry void it is primarily a bare site. Assessments of potential landscape, seascape and visual effects shall be made against this baseline.

7.2 Potential Construction Impacts

7.2.1 Harbour Development

The construction phase will see an intensification of activity at the Harbour site, including the temporary introduction of heavy plant, operating over a period of approximately 12 months. There will be temporary site accommodation, signage, fencing, material stockpiles and all the paraphernalia associated with construction. There will also be effects associated with localised works on the public road to the slipway, improving the provision of passing places.

7.2.2 Borrow Pit

Lealt Quarry, at Lower Tote is currently not in use. The proposal to operate this site as a Borrow Pit will reintroduce industrial activity to this location. It should be noted however, that the quarry has not been restored and effectively remains an established industrial feature within this landscape. The site is associated with the historic diatom works inland, and associated mineral railway, and processing site, at Lower Tote. The proposed use of the site does not introduce a new land use type or a new landscape element.

The temporary period of activity at the Borrow Pit, associated with the construction phase will introduce movement and noise and will permanently alter the landform within the excavation area itself. Following the use of the Borrow Pit for construction, and as the Harbour enters its operational phase, the Borrow Pit will return to its current status. In light of the potential for future use of Lealt Quarry, reinstatement of the site will ensure safe and stable slopes with a graded floor level with any blasted and/or processed materials, which are out of specification or not required for the Harbour project, being retained in a tidy state, as stockpiles, within the excavation void. The existing informal peripheral pathways will be retained. In landscape terms there is no potential for significant effects, beyond the project construction phase. Reduction in the floor level will slightly reduce the visibility of the workings from residential receptors.

7.3 Potential Operational Impacts

The operational phase will see an increase in activity at the Harbour site compared to the current baseline. The anticipation is that the Harbour will provide sheltered berths for at least 15 vessels. This will include those permanently resident as well as a number of seasonal or visiting boats. The development may lead to an increase in traffic although the site is noted as currently being busy, particularly seasonally. The slight increase in user numbers will be balanced by the infrastructure being proposed with layout designed to assist with managing visitor pressure in the long term. There may be a greater number of people accessing the Harbour but with improved mooring and car parking the effects on visual amenity are not likely to be significant. Receptors are almost exclusively visitors to the Harbour and as such are very likely to be accepting of the levels of activity.

Residual effects associated with the Borrow Pit will be considered in the EIA although they are not currently considered likely to be significant.

7.4 Mitigation Measures

Mitigation measures for potential visual impacts are primarily through design. The proposed development seeks to maintain the existing form of containment, enhancing the natural shelter afforded at the southern extent of Ob nan Ron. The proposed breakwater will be formed using locally sourced armour stone which will be readily accommodated within this setting, dominated by rocky shore particularly at low water. The proposed infrastructure will sit low against the water and all built development will be designed at a suitable scale for the location and to respect the local and maritime vernacular.

The design for the working of the Borrow Pit at Lealt Quarry ensures that visually this remains contained. The effects of excavation on landform are unavoidable and there is no intention to reinstate the site to original levels with infill. Due to its location, the existing exposed faces, partially visible in views from the south, sit alongside natural rock exposure of basalt sea cliffs, extending northwards from Inver Tote to Kilt Rock and beyond. The floor of the Borrow Pit while majorly hidden from view will be perceived by visitors who stop at Lealt Falls and explore Inver Tote on foot. The existing landform resulting from historical working is unquestionably artificial, as it will remain following exploitation as a Borrow Pit. It is however, associated with some interesting industrial heritage and as such, will generally be appreciated as a point of interest, rather than being to the detriment of this landscape.

There are many excellent interpretation boards throughout the area and an addition, explaining the contemporary use of this site, would further mitigate the short-term effects. This could be temporary, for the duration of operations at the Borrow Pit or, in consultation with the community, could be a permanent addition.

7.5 Proposed Environmental Impact Assessment

The potential impacts on landscape, seascape and visual during both the construction and operational phases will be **scoped in** to the EIA process. Therefore, a landscape, seascape and visual assessment will be undertaken and presented within the EIAR. The project lies within a sensitive landscape with high visitor numbers. The proposed development is located within the Trotternish NSA. Lealt Quarry is located within Trotternish & Tianavaig SLA (LLA).

The landscape assessment will include:

- A consideration of landscape baseline;
- The landscape character;
- A description of the likely effects on landscape character, on landform, on landcover, and on particular elements and features which may be characteristic of the local landscape and which may be considered landscape receptors;
- Consideration of the nature of the receptor and the nature of the effects (sensitivity and magnitude) and thereby the significance of effects; and
- The potential for mitigation of effects and of residual effects.

A visual assessment will be undertaken which will consider potentially sensitive viewpoints, including any potential for cumulative impact. Photomontage, for illustrative purposes, will

provide graphical representation of the operational Harbour. The assessment viewpoints identified in Table 7.5.1 are proposed.

Viewpoint selection is based on standard approaches that they should be publicly accessible and represent a full suite of likely receptors and from different directions. Three viewpoints are proposed for the Harbour, one representing the approach by road, one the approach on the path from Garafad (core path number SL25.01), and one offshore viewpoint is included to represent those approaching by sea. Three further viewpoints are proposed for the Borrow Pit, two being representative of residential receptors at Lower Tote, and Upper Tote as well as those travelling north on the A855, and one specifically to consider the effects on recreational visitors, passing the Borrow Pit to the An Leth-Allt Viewpoint overlooking the bay at Inver Tote.

Table 7.5.1: Proposed Viewpoints

Viewpoint	Location	Receptor	Type	Direction & Distance
Harbour Development				
1 –Òb nan Ron	NG 49582 68574*	Commercial, Recreational	Representative	200° - 300m
2 – Cadha Riach	NG 49584 67601	Recreational	Representative	345° - 500m
3 – An Corran	NG 49193 68442	Commercial, Recreational	Representative	130° - 300m
Borrow Pit				
4 – Lower Tote	NG 51628 59867	Residential, Transport	Representative	015° - 650m
5 – Upper Tote	NG 51738 59110	Residential, Transport	Representative	002° - 1.4km
6 – Inver Tote	NG 51864 60501	Recreational	Representative	005° - 0m

8 Noise & Vibration

8.1 Baseline

8.1.1 Harbour Development

Onshore elements

The existing slipway is located at the end of a road in a rural location with no significant anthropogenic noise sources present. Noise sources in the vicinity of the Proposed Development are primarily associated with vessel and vehicle movements, associated with slipway operations and recreational users visiting that area.

The nearest dwellings are located in the small residential area of Stenscholl, located approximately 500m southwest of the proposed development, there is a private residential property approximately 700m and 1.11km of north west of the Site respectively. These residential properties are located on the access road, used to access the slipway from the A835. The private residential property on Staffin Island is located approximately 800m of the proposed development.

As discussed in Section 11 the area is popular with tourists and recreational users, with footpaths passing close to the Proposed Development, noise can disturb the visitor experience, this is considered as part of the Population and Socio-Economic assessment. Potential ecological receptors which could be disturbed by in-air noise are discussed in Section 6 and will be considered as part of the biodiversity considerations.

Marine

No data is available for marine baseline noise levels within the proposed development area. The current source of underwater noise would be limited to vessel traffic; boats entering and exiting the slipway area. In addition, Acoustic Deterrent Devices (ADDs) may be utilised by the fish farms to deter seals from the fish stocks, and these will contribute to the baseline underwater noise levels. The nearest fish farm is approximately 7km southeast from the proposed development.

8.1.2 Borrow Pit

No activities are ongoing at Lealt Quarry, the main noise source in the area will be traffic utilising the A855. The closest residential properties to the Borrow Pit are located some 500m to the south-south-west.

8.2 Potential Constructional Impacts

8.2.1 Harbour Development

8.2.1.1 Noise

Onshore Elements

During the construction phase of the proposed development noise is likely to emanate from the construction activities and the associated machinery and equipment, there are however, no residential receptors in close proximity to the development which could be significantly adversely affected by these. Noise disturbance could be caused by the construction vehicles and material delivery vehicles driving past the private residential properties located along the

access road. This will however be a short-lived effect. With deliveries being limited to daytime hours as such no significant in-air noise effects are predicted.

Marine Elements

The construction activities below the MLWS do not include any which are likely to give rise to significant underwater noise such as drilling, blasting or piling.

The majority of works will utilise land-based plant, including for the removal of the existing breakwater and the placement of rock to reclaim land and to form the new breakwater. These activities are being carried out above the water level and in areas of shallow water, which also limits the creation of underwater noise. Vessel movements associated with construction will be few and utilise small craft capable or working in shallow waters.

Overall, there are limited underwater noise sources associated with construction and no significant effects predicted.

8.2.1.2 Vibration

In-air vibration is not expected to be an issue during the construction phase of the proposed Harbour development as there will be no blasting on site during construction.

8.2.2 Borrow Pit

8.2.2.1 Noise

Drilling and blasting, and processing operations, which are the noisier aspects of the proposal, are likely to be of a short duration, these being completed in around 6 - 8 weeks. Operations in relation to the loading and despatch of crushed rock and armour stone are likely to be undertaken over a longer period, the rate and duration of which shall be dictated by the Harbour development construction programme. These despatch operations are unlikely to generate any significant noise sources.

8.2.2.2 Vibration

The closest residential properties are located approximately 500m to the south-south-west. Blasting has the potential to result in perceptible levels of vibration. However, at such a separation distance, any blast vibration is likely to be of a low magnitude and a detailed blast vibration assessment is not considered necessary.

Notwithstanding the above, to allow blast vibration to be appropriately controlled, a criterion, derived from PAN 50, Annex D, of 6mms^{-1}ppv for 95% of events, with no blast exceeding 10.0mms^{-1}, is proposed as a satisfactory magnitude for vibration from blasting at residential properties.

8.3 Potential Operational Impacts

The proposed development allows for improved vehicle access and public facilities (parking, boat storage and toilets), resulting in an increase in noise through activity in the Harbour. However, with the lack of receptors, impacts associated with noise and vibration during the operational period is deemed negligible. Increases in vehicle traffic on the access road is not of a level that would give rise to a significant increase in in-air noise levels.

8.4 Mitigation Measures

8.4.1 Harbour Development

Construction techniques identified do not give rise to significant underwater noise sources.

8.4.2 Borrow Pit

Mitigation measures are likely to include:

- Specific operational hours in which operational activities will undertaken;
- Ensuring all plants are properly maintained to ensure integrity of silencers, lubrication of bearings etc.

8.5 Proposed Environmental Impact Assessment

Due to the limited noise receptors located in close proximity to the proposed Harbour development and the nature of the construction activities and operational activities, in-air noise and vibration will be **scoped out** of the EIA Process. Due to the lack of underwater noise sources underwater noise shall also be **scoped out** of the EIA Process.

Due to the proximity of the receptors to the proposed Borrow Pit and potential noise sources associated with its working, it is proposed that noise and vibration are **scoped in** to the EIA.

A noise impact assessment for Borrow Pit operations considering the potential noise impact, from all aspects of this operation, at the closest residential properties will be undertaken. The assessment will also consider noise in relation to recreational activities linked to the picnic area, viewpoints, and paths.

The results of the assessment will be considered against the criteria recommended within PAN 50 Annex A and, where appropriate, mitigation will be provided.

The closest residential properties are located some 500m to the south-south-west. Whilst blasting has the potential to result in levels of vibration, at such a separation distance, any blast vibration, whilst potentially perceptible, is likely to be of a low magnitude and a detailed blast vibration assessment should not be necessary. It is proposed that blast vibration is **scoped out** of the EIA.

Notwithstanding, to allow blast vibration to be appropriately controlled, a criterion, derived from PAN 50 Annex D, of 6mms-1 ppv for 95% of events with no blast exceeding 10.0mms-1 is proposed as a satisfactory magnitude for vibration from blasting at residential properties.

9 Soils, Geology and Palaeontology

9.1 Baseline

9.1.1 Harbour Development

The area surrounding the proposed development constitutes common grazing land and will not be included within the development area. Land capability for agriculture is class 5.3 (Land capable of use as improved grassland. Pasture deteriorates quickly). There are peaty soils and peat, underlying the coastal pasture. To the south-east soils are recorded as blanket peats, to the south-west they grade into brown earth soils.

The seabed geology within the proposed development and immediate vicinity comprises rock and hard substrate. With bedrock comprising siliciclastic, argillaceous with sandstone (undifferentiated) and with limestone (Marine Scotland, 2021a).

The proposed development is adjacent to the An Corran Geological Conservation Review (GCR) which is protected in terms of the Skye Nature Conservation order (NCO) 2019 in order to preserve the Middle Jurassic vertebrate fossils. Dinosaur footprints have been identified at An Corran (500m from the slipway). The GCR covers the area between MLWS and MHWS (i.e. the foreshore), starting at An Corran beach and ending on the western edge of the existing slipway.

9.1.2 Borrow Pit

The activities occurring at the Borrow Pit are entirely on previously disturbed (bare) ground with no discernible soil, with exception of a small area of additional landtake to the north belong to the Darlieth Association. The parent materials are drifts derived from basaltic rocks. The soils are generally peaty gleys.

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.

The proposed site is located approximately 100m from the Valtos SSSI, which is designated for its Bathonian features. A huge rockfall several decades ago has brought down huge blocks of sandstone. The Dun Dearg rockfall has an array of trace fossils throughout, and a tooth and a tail bone from a Coelophysis-type dinosaur were also discovered (UKGE Limited, 2017).

9.2 Potential Construction Impacts

9.2.1 Harbour Development

9.2.1.1 Soils

Due to the nature of the construction activities, the onshore components of the Harbour development will be constructed on either existing hard standing or reclaimed land, it is anticipated that there will be limited impact on soils. Site design iterations seek to avoid peat wherever possible, where peat has been recorded within the development footprint engineering solution(s) will be explored in order to retain peat in situ.

The installation of utilities, specifically water supply and electricity cables, will require excavation of land adjacent to the Harbour development area. However, soil will be reinstated

as soon as excavation is complete. Therefore, unlikely to result in significant effect on soil resources.

9.2.1.2 Geology and Palaeontology

Due to the location of the project adjacent to the An Corran GCR Site, there is potential that construction activities could potentially impact geological and palaeontological features such as fossils or footprints during the removal of rocks or the construction of the breakwater.

9.2.2 Borrow Pit

9.2.2.1 Soils

There is no peat within the Borrow Pit Site. No soil forming material will be removed from the site and all overburden and soils encountered shall be retained at the site for landscaping works.

9.2.2.2 Geology and Palaeontology

Due to the location of the Borrow Pit being within 100m of the Valtos SSSI, there is potential that the operating of the Borrow Pit (i.e. blasting of rock) to impact geological and palaeontological features.

9.3 Potential Operational Impacts

There are no anticipated operational impacts on soils, geology and palaeontology as a result of the operational activities at the Harbour development.

9.4 Mitigation Measures

9.4.1 Harbour Development:

The proposed developed has been designed to avoid peat, where practicable. Any soil that is excavated in order to install any utilise (e.g. water supply) will be stockpiled and stored according to the soil layer and reinstated as soon as possible.

The design of the proposed development has accounted for the GCR to the west of the existing and as such has been designed to avoid the foreshore area west of the Slipway.

9.4.2 Borrow Pit:

Mitigation Measures for the Borrow Pit include:

- All soils shall be retained on site and utilised for screening and restoration. There are no relevant impacts in relation to the soil resource;
- Prior to the commencement of soil stripping a blind catch ditch shall be formed along the northern boundary;
- Prior to soil stripping, silt traps shall be installed along the minor water feature on the eastern site boundary;
- Soil stripping shall only be carried out when soils are reasonably dry;
- Work routines for stripping operations shall be designed to minimise vehicle movements on unstripped land, and at all times the mechanical handling and compaction of the topsoil shall be minimised;
- No vehicle, other than those involved in the stripping operations, shall be permitted on unstripped land;

- Soil mounds shall not be traversed by heavy vehicles or plant other than in the course of formation or removal for respreading; and
- The sides and top surfaces of all mounds shall be evenly graded and shaped to prevent water ponding on their surfaces.

9.5 Proposed Environmental Impact Assessment

Due to the nature of the proposed Harbour development, construction activities are anticipated to have limited impacts on soil resources. It is therefore proposed that soil is **scoped out** of the EIA for the construction phase.

Due to the nature of the Borrow Pit operations, the potential for impacts on peat will be reduced insofar as possible. It is therefore proposed that soils are **scoped out** of the EIA for the construction phase for the Borrow Pit.

Due to the location of the proposed Harbour Development in relation to the GCR, it is proposed that geology and palaeontology is **scoped in** to the EIA for the construction phase. The proposed Borrow Pit is located within 100m of a GCR, it is therefore proposed that geology and palaeontology is **scoped in** to the EIA for the construction phase.

The EIAR will seek to identify the geological and palaeontological significance of the area within which the Harbour Development and the Borrow Pit will be developed, identify potential significance finds which may result as a consequence of the proposed development, to identify threats to these assets and to propose mitigation methods to minimise their damage or loss. This will include for consideration the geological and palaeontological assets within 1.5 miles of the Harbour Development and Borrow Pit, as well as the underlying geological and palaeontological potential of the rock units therein, which extend across Skye and the Inner Hebrides.

Due to the wealth of literature on the geology and palaeontology within the study area, a desk based approach is proposed. Information will be sourced from existing databases, published scientific literature, geological maps and aerial photography.

10 Hydrology, Hydrogeology, Water Quality and Coastal Processes

10.1 Baseline

10.1.1 Harbour Development

The coastal water surrounding the proposed Harbour development is the North Skye (200493) coastal water body. It is 356.6km^2 in area and designated by the Inner Hebrides and the Minches SAC, as discussed in **Error! Reference source not found.**. In 2014 it was classified as having good overall, ecological and chemical status (SEPA, 2021b).

The closest notable river body is the Stenscholl River (20701) located approximately 1 km from the proposed Harbour development. The main stem of the river is 13.5km in length and in 2014 it was classified as having good overall ecological and chemical status (SEPA, 2021b).

The surface water 1km north of the site (Stenscholl River) is classified by the Scottish Environmental Protection Agency (SEPA) flood map (SEPA, 2021a) as having a medium-high chance of flooding. The existing access road crosses the river and is the only access road by vehicle to the site.

The development is located within the groundwater body 'Skye North' (150688), which has an overall status classified as 'good'. The groundwater body covers an area of 1132.0km^2.

The MHWS is at +5.3m CD and the Highest Astronomical Tide (HAT) is +6.0m CD. Staffin is not considered a Potentially Vulnerable Area for flooding (SEPA, 2021a).

10.1.2 Borrow Pit

The coastal water located approximately 200m east of the proposed Borrow Pit development is the North Skye (200493) coastal water body.

The closest notable river body is the River Lealt (20702) located 200m south of the Borrow Pit. The main stem is approximately 11.3 km in length. In 2014 it was classified as having good overall ecological and chemical status (SEPA, 2021b).

10.2 Potential Construction Impacts

10.2.1 Harbour Development

During the construction phase, there is the potential of pollutants to enter the marine environment through unplanned releases from the storage of material, equipment and plant use, cement washings silt water runoff and storage of waste.

The proposed development is unlikely to directly impact on the Stenscholl River due to the location of the river and the shape of the coastline, however, it is likely to impact on access to the Harbour Development should the river flood. However, annual rise in sea levels each year has the potential to impact on the infrastructure and buildings of the Harbour Development.

As the seabed comprises mostly rock with limited areas of sand and low energy activities associated with removing and placing of materials on the seabed, sedimentation issues and

resulting decrease in water quality are unlikely to occur as a result of the construction of the breakwater and slipway.

10.2.2 Borrow Pit

Surface and groundwater impacts are anticipated to be negligible to slight at the Borrow Pit.

The Borrow Pit operations could have the potential to impact on hydrology in the following ways:

- Physical changes to overland drainage, which may include the removal of surface drainage or installation of a new drainage system;
- Introduction of particulates arising from Borrow Pit operations into watercourses;
- Contamination from fuels/oils used by quarrying plant; and
- Increase in flood risk.

Secondary effects could also occur, notably modifications to freshwater and riparian ecology owing to changes in the hydrological regime.

Potential changes to the hydrogeological regime relate to the effects of Borrow Pit excavation operations within the hard rock reserve. The potential impacts are essentially related to:

- Groundwater management, including modification to the hydraulic gradient and groundwater inflow to the excavation;
- Contamination from fuels/oils from quarrying plant; and
- Increase in flood risk.

10.3 Potential Operational Impacts

The construction of the proposed breakwater and the extension of the existing hard surfacing through reclamation on the foreshore has the potential to alter the wave climate and sediment movements with potential knock on effects to the local coastline.

Once operational, the water will be supplied to the Harbour development from the natural spring located 80m the southwest of the Harbour. The total water usage once operational is anticipated to be approximately 7,200 litters per day. The flow rate of the spring was sampled on 4 occasions between December 2020 to mid-February 2021 by HighWater private Water Suppliers. The results are presented in the Table 10.3.1.

Table 10.3.1: Spring Flow Rates between December and Mid-February

Date	Flow rate (litres/minute)	Comments
5th December 2020	40	Wet weather during the preceding days
15th January 2021	37.5	Showers
5th February 2021	21.4	Dry weather for preceding days
12th February 2021	15.8	Dry weather for preceding 3 weeks. Very cold weather, all nearby streams and ditches frozen but spring still flows.

It was noted that while the flow rate is variable, the fact that spring did not freeze after 3 weeks of sustained cold weather, it is a true spring source. Even at the lowest flow rate (15.8 litres/minute), the spring can supply up 22,750 litres per day. This is way above the average of 7,200 litres per day required at the Harbour development, which is likely to be much less during the winter months, with fewer visitors coming to the Harbour. In addition, the infrastructure at the spring during operation will allow for management of this ground water resource by monitoring the volume of water being utilised and ensuring the water is not wasted. There is therefore unlikely to be a significant impact on ground water quality during the operation of the Harbour.

A marine outfall pipeline for foul discharge will be constructed, with discharge occurring below MLWS. Foul discharge into the marine environment has the potential to impact on water quality.

In addition, there is the potential that a loss of containment from the oil storage tank could lead to oil being unintentionally released into the marine environment.

10.4 Mitigation Measures

10.4.1 Harbour Development

In order to minimise the risk of spill (pollution event), secondary containment has been incorporated into the design - building the bund wall and location of the tank set back from the shore. The potential for loss of containment will be minimised through standard good practice such as regular maintenance, spill prevention and response procedures.

The flood risk has been taken into account in the designing of the proposed development, specifically the placement of the onshore elements (i.e. buildings, storage sheds and fuel storage).

Water, being abstracted by the spring will be managed through regular water meter readings, fixing any leaks in the pipeline feeding the water tank as soon as they are reported, regular inspections of all taps and pipes to ensure that there are no leaks within the WC's.

10.4.2 Borrow Pit

Hydrological and hydrogeological mitigation measures that shall be employed during the construction phase of the of the Borrow Pit shall include, but are not limited to, the following:

- Minimising readjustments of hydrological surface water catchments during and following Borrow Pit establishment;
- Establishing site spillage and emergency procedures for the site, which will be prominently displayed, and staff will be trained in their application; and
- Establishing maintenance procedures and checks to ensure the minimisation of leakage of fuels or oils from plant.

10.5 Proposed Environmental Impact Assessment

Due to the nature and location of the Harbour Development it is anticipated that impacts water quality will be **scoped in** to the EIA for the construction phase. Identified impacts will be assessed and appropriate mitigation recommended.

In the absence of Scottish guidance, the Environment Agency's WFD Assessment guidance (Environmental Agency, 2017) has been utilised where appropriate. As there is a potential for the proposed Harbour development and Borrow Pit to give rise to potential impacts on water quality, an Environment Agency's WFD assessment scoping template was completed, to provide an understanding of the need for WFD assessment topic areas. The completed WFD scoping is provided in Appendix A.

Table 10.5.1 identifies the receptors and issues identified during the WFD scoping that will require additional assessment for the North Skye coastal waters within the EIAR. The Stenscholl River and River Lealt have been scoped out.

Table 10.5.1 WFD Issue Sign Posting to Where Considered

Receptor	Risk issue	Where Considered
Hydromorphology	Coastal Processes	Will be considered within the Hydrology, Hydrogeology and Coastal Processes Chapter in the EIAR
Biology: Habitats	Destruction of higher sensitivity habitats specifically subtidal kelp beds	Will be considered within the Benthic Ecology Chapter in the EIAR
Water Quality	Loss of containment of contaminants during construction and operations	Will be considered within the Hydrology, Hydrogeology and Coastal Processes Chapter in the EIAR

Due to the location of the Borrow Pit, coastal processes will not be applicable to the site, however, potential impacts on surface and ground water resources will be **scoped in** to the EIA processes for the construction phase. A hydrological and hydrogeological assessment will be undertaken. The assessment will consider the existing conditions at site and how water within the excavation void will be managed, both during the Borrow Pit development, including the potential for water contamination, and post restoration, and will assess any potential impact on the wider water environment.

The potential impacts on sediment and coastal processes will be **scoped in** to the EIA process for the operational phase. Hydraulic Modelling will be undertaken, utilising the MIKE coastal process modelling software developed by the Danish Hydraulic institute to understand effects of the development on the wave climate and sediment movement.

11 Population, Human Health and Socio- Economics

11.1 Baseline

According to the National Records of Scotland, Highland Council Area Profile, the population of the Highlands was estimated at 235,830, with the population estimate for the Skye and Lochalsh being 13,100 (National Records of Scotland, 2020). The main economic sectors on the Isle of Skye are crofting, fishing, fish farming and tourism (Gittings, 2012). Recent population growth has occurred in remote rural areas of the Island and within the urban area of Portree.

According to the Highland Council 2011 Census Profile for wards shows that of the estimated Highlands population, 54.1% are in 'very good' health. 71.5% of the population aged 16 to 75 are economically active with only 4% of the aged 16 to 75 unemployed.

11.1.1 Harbour Development

The Harbour development is located in close proximity An Corran Beach, a popular tourist attraction known for the dinosaur footprints identified in 2002, located approximately 500m north from the existing slipway. Over the peak tourist season (summer months) the area is popular amongst tourists who utilise the informal parking at the slipway. Campervans also overnight in the vicinity of the slipway.

There are number of walking routes around the Staffin area, used by both the local community and the visitors. Figure 11.1.1 depicts the walking route around Staffin which starts at the Staffin Slipway. The trail starts and ends at the slipway and includes the use of the single track access road, which has no footpaths. Alternatively, the trail is accessed from Columba 1400 Leadership Centre off the A855.

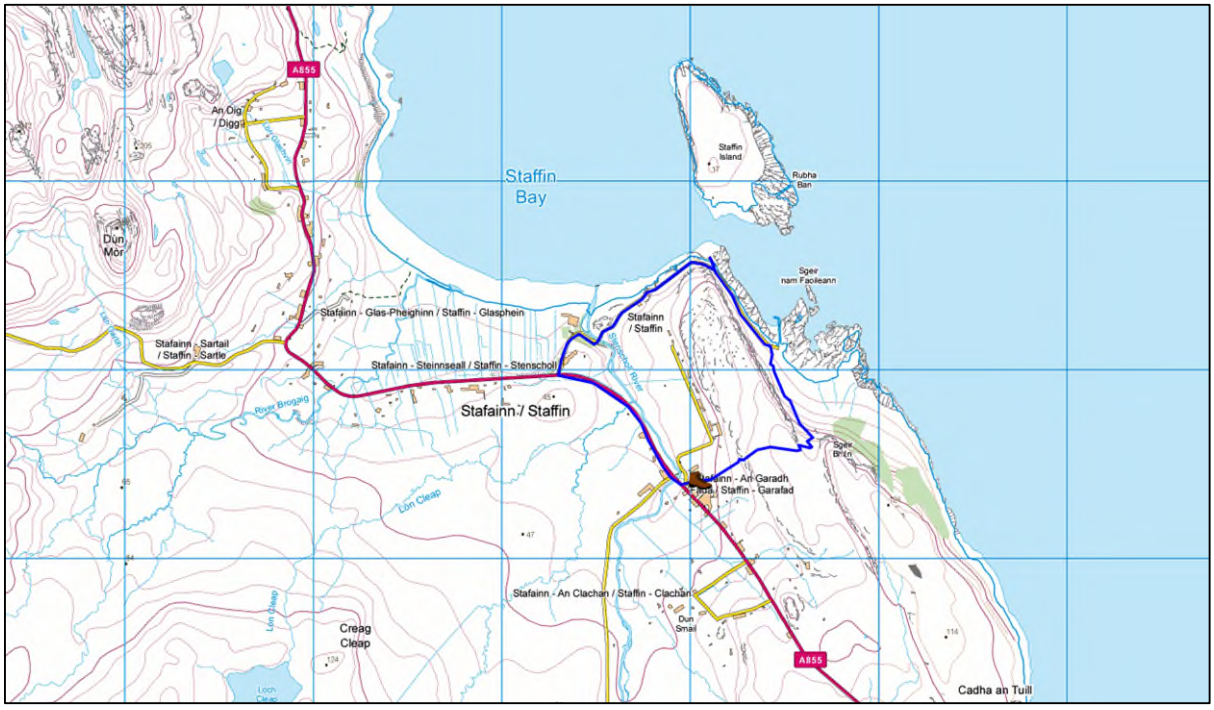

Figure 11.1.1: Walking Trail around Staffin

The Slipway is currently utilised by the commercial fish farms and Creel fishing operations which are based in Staffin. According to the Organic Sea Harvest website, who currently operate two fish farms within the Staffin area and utilise the Slipway, the operations have provided 12 full time jobs and have invested approximately £13 million into the local economy (Organic Sea Harvest, 2021).

Currently boats, that are not removed from the water daily, are moored between the slipway and Staffin Island (located approximately 600m north of the existing slipway) (Figure 11.1.2). Small dinghies are used to ferry people from the slipway to their boats and back. However, when the sea is too rough, the dinghies cannot leave slipway area, preventing access to anchored vessels.

Figure 11.1.2: Boats Moored between Staffin Island and the Staffin Slipway

11.1.2 Borrow Pit

The Borrow Pit forms part of the historic industrial activity of Diatomite extraction and processing factory (Skye Ecomuseum), which closed its doors for operation in the early 1960's as a result of cheaper foreign imports (Skye Ecomuseum, 2020). This now forms part of the tourist interest in the local area. Approximately 200m south of the Borrow Pit is An Leth-Allt viewpoint, which has a public parking and picnic areas.

From the viewpoint, there are walking trails which leads around the seaward side edge of the quarry, which contains interpretation boards explain the history of the area.

11.2 Potential Construction Impacts

As the construction contract has not yet been appointed, it is not possible at this stage of the development to where the construction workforce will be sourced from. The use of local workforce will be encouraged. There is however a likelihood that a portion of the workforce will be sourced from off island and utilise local accommodation and services during the construction period. This is likely to have a positive socio-economic impact on the area. Due to the temporary nature and relatively small number of people required for this development, this is not anticipated to be significant.

11.2.1 Harbour Development

As the slipway is utilised by both the community and tourists as the start of the walking route, which includes a portion of the single-track access road, and utilise the area above the slipway for parking, it is likely that the construction activities may impact on access to the walking route. While there is no intention to restrict access, there will be limited space at the Slipway for parking. In addition, access from the track to the slipway maybe restricted during periods of high-risk activities to ensure the safety of the public. This is likely to be for very short periods of time.

In terms of the value of the experience for tourists walking along the Staffin circuit, the increased activity along the single-track access road and the noise and activity associated with construction at the Slipway will impact on the value of the experience between the Slipway and the A855.

As construction activities will be occurring south of the dinosaur footprints at An Corran beach, access to the footprints will not be restricted as a result of construction activities. However, the is likely to be an increase in traffic on the access road and some congestion at the An Corran beach parking area due to limited turning space and parking at Slipway.

There is potential for construction works to impact upon movements of vessels associated with the commercial fish and fish farming operations. Refer to Section 13.1.2 Navigation), however, the extent of this will not significantly impact on the day to day operations such that there will be economic impacts to fishing sectors.

11.2.2 Borrow pit

During the operation of the Borrow Pit access to the An Leth-Allt viewpoint, public parking and picnic area and walking trails along the perimeter of the Borrow Pit may be temporarily restricted during blasting operations. This will however only occur during blasting which is not an ongoing processes so any restrictions will be short lived.

There are likely to be effects on the local community as a result of the noise from quarrying operations and the movement of Heavy Goods Vehicles (HGV's) at the site and along the public road. Noise has been discussed in Section 8 and will assessed within the EIAR. Short term contemporary works at the Borrow Pit could leverage additional interest in the economic geology the local area, due to the historic nature of the site.

On completion of the Borrow Pit extraction operations, extraction areas shall be left in a safe and stable condition, complete with suitable edge protection bunding, warning signage and peripheral fencing. The Landowner shall be responsible for ensuring safety of members of the public following completion of works.

11.3 Potential Operational Impacts

The development of the Staffin Community Harbour aims to support tourism and commercial fishing and fish farms in the area by providing a functional slipway and safe berthing for boats as well as parking and adequate onshore infrastructure. Once construction is complete and the Harbour is operation, it will allow for the boats supporting the fish farms and creel fishermen to safely berth at the pontoon.

Through the creation of the Harbour, a number of new tourism opportunities can be established. Not only will the Harbour provide a safe space for visiting vessels to stop over in, but creates an opportunity for tourism companies to operate vessels to take visitors out to take in the beauty of the landscape by sea.

As discussed in Sections 4.3 and 8.3 there is unlikely to be human health impacts as a result of air quality or noise resulting from the Harbour.

Once operational there will be an increase of users to the Harbour area, increasing the risk of drowning and other water related risks to human health. As there will be more formal harbour management, mitigation as discussed in Section 11.4.1.2, will be implemented to manage this risk.

11.4 Mitigation Measures

11.4.1 Harbour Development

11.4.1.1 Construction

Clearly displayed diversion routes to be utilised should any part of the footpaths be inaccessible.

Clear communication with community and commercial operators to ensure that should there be any access restrictions at the existing slipway that these are well communicated along with alternative provisions.

Clear signage displayed at the start of the track indicating lack of turning space and parking at the slipway.

11.4.1.2 Operation

To reduce the risk of drowning and other water related risks, life rings, signage and appropriate signage will be installed.

11.4.2 Borrow Pit

The Positioning of all necessary safety zones and sentries during drilling and blasting will be managed by the appointed drill and blast specialist.

Clear communication with the community to ensure any access restrictions are communicated ahead of time.

Signage must be erected at an appropriate distance from the public parking area and picnic area indicating access restrictions.

Current legislation and guidance, as stated in The Quarries Regulations 1999 (as amended) and The Land Reform (Scotland) Act 2003 shall be adhered to during Borrow Pit operations.

11.5 Proposed Environmental Impact Assessment

It is proposed that population, human health and socio-economics is **scoped in** to the EIA for both construction and operational phases. During construction, there is potential for disruption to access of the surrounding footpaths etc. During operation there is potential economic benefits and safety considerations (all positive).

The assessment within the EIAR will consider job creation, access restrictions to local amenities and reducing the value of the experience during the construction phase. During the operational phase the assessment will look at job creation, creating tourism opportunities within the area, improved facilities for the commercial fish farms and creating an attractive community space.

12 Natural Resource Usage and Waste

12.1 Baseline

12.1.1 Harbour Development

The existing slipway area currently has minimal ongoing natural resources use and waste. Water is supplied to the site from the spring, which is gravity fed to a tap behind the existing boat shed. There is currently no electricity supplied to the proposed development area.

Currently there are no bins provided for the site and therefore no existing waste management in place.

There is no fuel oil storage, vessels either collect diesel at the fuel station in Staffin in Jerry cans for refuelling at the Slipway or vessels travel to Portree to refuel, which is approximately 15 NM to the south.

12.1.2 Borrow Pit

Lealt quarry is an existing natural resource (source of rock) that has previously been utilised for extraction to support local development.

12.2 Potential Construction Impacts

12.2.1 Harbour Development

During construction of the proposed development, materials will be required for the construction of the breakwater, extension of the hard surfacing through land reclamation and construction of the slipway.

Table 12.2.1: Proposed Construction Resources

Material	Use	Source
Rock Armour (primary and secondary)	Armouring of the proposed breakwater	Proposed Lealt Borrow Pit
Rock Infill	Infill for breakwater and land reclamation	Proposed Lealt Borrow Pit
Concrete (in-situ)	Structural	TBC
Concrete (Concrete slabs)	Structural	TBC

Infill material will be required for the extension of the existing hard standing area to create additional space for parking. The rock will be sourced from the proposed Borrow Pit at Lealt.

The construction phase is likely to produce general construction waste, including material packaging, general waste from the welfare facilities, oily rags from machinery and equipment. The largest volume of waste is the concrete slabs from dismantling of the breakwater toe. However, it is anticipated that the volume of waste being produced will be low and not place strain on the landfills.

12.2.2 Borrow Pit

Government guidance on the interpretation of The Management of Extractive Waste (Scotland) Regulations, under the Mine Waste Directive advises that the Directive is intended to reflect the commerce of working minerals for sale, rather than as an integral part of another project (commercial or not) using those minerals. The Regulations are not therefore taken to apply to Borrow Pits. Irrespective, it is worth noting that any waste from Borrow Pit operations (soils or processing fines) will be retained on site and utilised for the final reinstatement of the Borrow Pit site.

12.3 Potential Operational Impacts

During the operational phase of the project there will be an increase in the demand for water for domestic purposes (drinking, toilets and washing of boats etc.). This will be sourced from the spring and is discussed further in Section 10: Hydrology, Hydrogeology, Water Quality and Coastal Processes.

During the operation of the proposed development, formal waste management will be implemented across the site through the introduction of waste bins. waste being disposed of is likely to be general waste and recyclables. In addition, there may be special waste being produced as a result of oily rags from vessels, old jerry cans or oil cans. The volume and types of waste that are likely to be produced during the operational phase of the proposed development are likely to be minimal.

12.4 Mitigation Measures

Mitigation proposed to minimise negative effects on natural resources and waste during construction for both the Harbour Development and Borrow Pit are outlined in **Error! Reference source not found.**.

Table 12.4.1: Proposed Mitigation for Natural Resources and Waste

Phase	Aspect	Mitigation
Construction	Material and water usage	• Reuse of material, where practicable. • Utilising local produced / sourced material, where possible.
Construction	Waste	• Waste hierarchy employed. • Waste appropriately segregated and sentenced.

12.5 Proposed Environmental Impact Assessment

It is proposed that natural resource usage and waste is **scoped out** of the EIA for both the construction and operational phases due to the lack of significant potential impacts associate with the proposed development. The mitigation measures outlined in **Error! Reference source not found.** will be included in the SoM in the EIA to ensure they are implemented.

13 Traffic, Access and Navigation

13.1 Baseline

13.1.1 Traffic and Access

Access to the Proposed Development will be via the existing public single track access road with passing places leading form the A855 to the Staffin Slipway. Access to the Borrow Pit is directly from the A855. The A855 is a two-lane road at this point, with a speed limit of 60mph.

13.1.2 Navigation

Perennial commercial users are Organic Sea Harvest, who are currently operating up to three fish farm support vessels <10m length overall (LOA), and up to three local creel fishing vessels <10m LOA. These vessels are typically kept on swinging moorings within Òb nan Ron to the south of Stenscholl Island.

Local non-commercial use is typically restricted to the summer months (May to September) in vessels of <7m LOA which are dry-sailed (launched and hauled each day). Around 20 individual local boats may use the slipway each season, with typically no more than 12 operating on any single day.

An occasional marine tourist vessel uses the slipway for launching, hauling, landing, and temporary berthing during the summer months, typically no more than 1 per day. While local and visiting recreational vessels use the slipway for launching, hauling, landing, and temporary berthing during the summer months, typically no more than 4 per day.

13.2 Potential Construction Impacts

13.2.1 Traffic and Access

Construction effects are likely to occur during the delivery of materials required to construction the proposed development. This will include the import of quarried materials from sources located to the south of the site and accessed via the A87 and A855.

All construction traffic will access the site via the existing access road to proposed Harbour development. Upgrades to the unclassified road will be necessary and will include additional and extended passing places to accommodate traffic flow in both directions, designed in accordance, where possible, to The Highland Council design standards.

13.2.2 Navigation

During the construction phase there is likely to be an impact on the navigational route into and out of the Harbour as the dismantling of the breakwater will require the use of machinery and the need for safety boat within close proximity to the navigational access route to the slipway.

As the existing slipway will remain in-situ, boat launching activities will continue as normal, however, there may be periods during construction when access to the slipway will be restricted due to construction activities (e.g. dismantling the slipway toe). This is likely to be short lived. In addition, the construction of the marine elements may restrict boats entering or existing the harbour area (i.e. restricting access to the slipway).

13.3 Potential Operational Impacts

13.3.1 Traffic and Access

During the operational phase of the project, there is anticipated to be an increase in harbour users resulting in more cars utilising the single – track access road. However, it is likely that the some improvements will need to be made to the access track, which will make access to the Harbour safer.

13.3.2 Navigation

As the Harbour Development is likely to attract more boats, especially visiting vessels, there is an increased risk of grounding due to skippers being unfamiliar with the shallow nature of the water.

Once the Harbour becomes operational, there will be AtoN assisting boat users to safely enter and exit the Harbour. This is deemed a positive impact on navigation, ensuring local users as well as visitors can safely access the Harbour.

The Harbour will provide secure / safe berthing for vessels of up to 12m LOA during all weather conditions and tides. In addition, there will be safer launching, hauling, loading and unloading facilities in all weather conditions and tides. This will have a significant positive impact.

13.4 Mitigation Measures

13.4.1 Traffic and Access:

Carry out assessment of the road to determine what the condition of the current road and suitability of the construction and operational phases to determine the need for improvements.

Construction traffic will have an impact on the road network and appropriate mitigation measures will be developed to mitigate the impacts. These will include a framework Construction Traffic Management Plan (CTMP), which will be outlined in the application documents.

13.4.2 Navigation:

The proposed development has been designed in such a way that it has taken into account the wave climate to ensure safe berthing for vessels. In addition, the need for navigational aids will be incorporated and plan.

13.5 Proposed Environmental Impact Assessment

It is proposed that traffic and access impacts are **scoped in** to the EIA for both the construction and operational phases. The assessment will consider the potential effects associated with construction and operation of the proposed development as detailed below.

The key issues for consideration as part of the assessment will be:

- The temporary change in traffic flows and the resultant, temporary effects on the study network during the construction phase;
- The physical mitigation associated with the improvement of the Staffin access road; and

- The consideration of appropriate and practical mitigation measures to offset any temporary effects.

The potential effects of these will be examined in detail.

It is proposed that navigation impacts will be **scoped in** to the EIA for the construction and operational phases. The navigation assessment will consider restrictions to the navigational route associated with construction but also the adverse effects of collision and grounding during the operational phase. The operational phase will however give rise to beneficial effects such as safe and sheltered berthing, improved boat launching and hauling and improved access into and out of the Harbour. A draft AtoN plan will be drafted and presented as part of the EIA.

14 Impacts from Major Accidents and Disasters

An initial list of major accidents/disasters was developed. These were then considered in terms of how the site location and the proposed land use may affect the risk of each disaster. Table 14.1.1 **Error! Reference source not found.** outlines the major accidents and disasters, the potential risk associated with location and site use and additional comments.

Table 14.1.1: Potential Major Accidents and Disasters

Major Accident or Disaster	Location Risk	Proposed Use Risk	Comments
Biological hazards	N	N	Screened out
Earthquakes	N	N	Screened out
Mass Movements	N	N	Screened out
Severe Storms	Y	N	**Further Consideration Required** No additional risk as a result of this project. This has been considered as part of the design and will be discussed within the navigation chapter in the EIAR.
Serve Droughts	N	N	Screened out
Displaced Population	N	N	Screened out
Fire	N	N	Screened out While the development does introduce new fire sources (oil storage tank and electricity). Buildings, substations and tanks will be managed via standard practice.
Flood / Surges	Y	N	**Further Considerations Required** Discussed in Water Quality and Coastal Processes (Section 13).
Terror Attacks	N	N	Screened out
Transport Accidents	N	N	Screened out Will be considered as part of Traffic Assessment in the EIA

15 Cumulative Impacts

15.1 Onshore Developments

The Highland Council's ePlanning website (Highland Council, 2021) was accessed on the 23rd of June 2021 to identify and review any projects in the planning process that could give rise to cumulative or in combination effects. They have been examined to determine if any applications would give rise to a new receptor that may need to be considered within impact assessments.

In total, 12 planning applications were made within a 1.5km radius of the harbour development in the previous 28-month period (February 2019 to June 2021). Interpretation panels constituted three of the applications; these have already been installed and, as such, will be considered as baseline.

Six of the applications are for new houses around Clachan, all of which have been granted consent. A small camping pod has also been permitted in the hamlet. Due to the scale of these developments, they are unlikely to give rise to cumulative effects even if constructed simultaneously. The houses are in an area of existing residential properties, and as such, they are not deemed to give rise to a new receptor. However, it is noted that they are increasing the size of the hamlet of Clachan.

Planning permission has been granted for an agricultural building in Stenscholl. This is not likely to give rise to cumulative effects due to its scale, nor is it a new receptor.

The final planning consent near the slipway is for the conversion of an agricultural shed to a farm shop and catering facility. This is located to the east of the minor road leading from the A855 to the slipway, just to the North of the junction with the A855. As both projects will be utilising the junction with the A855, and the farm shop is likely to give rise to additional vehicle movements, it will be considered in the Traffic Impact Assessment.

In total, 12 planning applications were made within a 1.5km radius of the borrow pit in the previous 28-month period (February 2019 to June 2021). Interpretation panels again constituted three of the applications and will be considered as the baseline due to already being installed.

Two of the applications are for new houses around Lonfearn (approximately 1km to the North of the borrow pit), and another is for a set of three small holiday pods within Lonfearn. These have all been granted consent and will share a new access road coming off the A855. Two applications for holiday let units sharing a plot of land have also been granted planning permission in the existing settlement of Grealine (approximately 1km to the North, North West of the borrow pit). Planning permission for a new house in the existing settlement of Lower Tote (approximately 1km to the south of the borrow pit) was also granted.

These new houses and holiday pods are unlikely to give rise to cumulative effects even if constructed at the same time due to their small scale. They are all located close to existing residential property and are no closer to the borrow pit than the existing properties. They are not new receptors for consideration in EIA terms; rather, they increase the size and potential sensitivity of the existing settlements as receptors.

A Prior Notification application for the construction of a new agricultural shed in Lower Tote was submitted, but it was decided by the authority that prior notification was unnecessary. The search in June 2021 identified that this has since been followed up with an application for retrospective permission for quarrying and permission for further quarrying, to level the area needed for the development. A further 4400 cubic metres of material is required to be extracted from the site, and the proposal is currently under consideration. The access road to this site joins the A855 approximately 700m south of the proposed borrow pit of the proposed SCH development.

Having regard to the separation distance from the borrow pit, and the small scale and short duration of the two developments, the potential for any cumulative impact in terms of noise, dust, traffic, hydrology or ecology is unlikely. As the two sites are intervisible, the potential for cumulative landscape and visual effects is considered (Chapter 13).

The final planning consent is for a marine fish farm located 500m offshore around 1km north of the borrow pit. No negative cumulative impacts are expected to arise as a result of this development's offshore location. Indeed, this development will benefit from the increased ease of access provided by the Staffin Community Harbour (SCH) development project.

15.2 Offshore Development

Current marine renewable energy projects, construction, cable and National Renewable Infrastructure Plan projects are listed on the Scottish Government website and were accessed on the 23rd of June 2021 (Marine Scotland, 2021). Each project type has been considered in turn to identify projects which could have cumulative or in-combination effects. The potential impacts of this slipway redevelopment project are predicted to have a relatively limited geographic extent. Thus, only projects within an approximately 70km radius of the development were considered. This area encompasses projects in The Minch, the Little Minch and the Sea of the Hebrides and broadly covers Skye, the Western Isles, and the coastal mainland from Ullapool to Mallaig. In total, ten projects were identified and are considered in more detail in Table 15.2.1 to establish whether or not there is a possibility of cumulative effect.

Table 15.2.1: Marine Projects for Cumulative Consideration

Project type	Status	Proposal	Approx. distance from Staffin	In/Out	Reason for inclusion/exclusion
Maintenance of existing works	Application	Bridge Maintenance Works, A87 Kyle of Lochalsh	~ 50km straight line ~ 50km by sea	OUT	An EIA was not required for this project, and so any environmental impacts will be non-significant, localised and very unlikely to result in cumulative effects.
Cable	Application	Cable Replacement – Isle of Skye to Harris	~ 20km straight line to the nearest point ~ 35km by sea	OUT	There is potential that construction could overlap with the SCH development. However, the impacts associated with cable lays are very localised, and so it is unlikely any cumulative effects will arise between the projects.
Construction of new works	Application	Deep Water Port, Glumaig Bay, Stornoway	~ 65km straight line ~ 65km by sea	IN	It is likely the construction works may overlap, and thus there is potential that both developments could impact mobile receptors (particularly marine mammals). The potential cumulative effects will therefore be taken into consideration in the relevant chapters.
Construction of new works	Application	Ferry Terminal Development – Tarbert, Isle of Harris	~ 45km straight line ~ 50km by sea	OUT	Construction works at Tarbert harbour will be completed by autumn 2021. This will not overlap with those at Staffin, and so cumulative construction effects between the two projects will be very unlikely. The ferry terminal extension will facilitate a larger vessel but will not change the ferry timetable, and as such, it doesn't change the current baseline in terms of vessel movements.
Construction, alteration or improvement of any works	Pre-application	Kishorn Port Land Reclamation for Laydown Area	~ 40km straight line ~ 60km by sea	OUT	The project does not require an EIAR, and the main marine effects identified in the screening opinion (Affric Ltd., 2020) were negligible after mitigation. Together with the presence of land between the two developments, this means there are unlikely to be any cumulative effects.
Construction, alteration or improvement of any works	Post-consent	Kyleakin Feed Mill Construction	~ 45km straight line ~ 50km by sea	OUT	The construction for this project has already been completed and, as such, will be considered as the baseline.

Project type	Status	Proposal	Approx. distance from Staffin		In/Out	Reason for inclusion/exclusion
Construction, alteration or improvement of any works	Application	Lochmaddy Ferry Terminal Development	~ 55km straight line ~ 70km by sea		IN	Construction has been delayed, so this stage will likely overlap with the Staffin slipway. The project is located on the east coast of North Uist. Thus, it could potentially impact the same mobile marine mammal receptors; hence there is a potential for cumulative effects.
Construction, alteration or improvement of any works	Licence	Newton Marina Development	~ 65km straight line ~ 65km by sea		OUT	The development has completed its construction phase and is now operational. As such, it is considered to be the baseline.
Construction of new works	Application	Uig Ferry Terminal Development, Uig, Isle of Skye	~ 10km straight line ~ 35km by sea		IN	There is potential for the construction works at this relatively close project to overlap. Its construction programme involves piling operations, which have the potential to impact mobile marine mammal receptors. Due to the same receptors potentially being impacted by construction at the Staffin slipway, this project will be further assessed for cumulative impacts.
Cable	Application	Western Isles to Mainland Scotland HVDC Interconnector	~ 50km straight line ~ 50km by sea		OUT	Whilst there is potential for the construction works to overlap with those for the Staffin slipway, the relatively localised nature of impacts expected from both developments means no cumulative effects should arise.

16 Summary

A full range of environmental aspects relating to the development of the Staffin Community Harbour development have been considered. Table 16.1 summaries the environmental aspects which are proposed to be scoped in and out of the EIA.

Table 16.1: Proposed Scoping for the EIA assessment

Topic	Construction and Site Preparation		Operation
	Harbour Development	Borrow Pit	
Air Quality			
Climate Change			
Archaeology and Cultural Heritage			
Benthic Ecology			
Fish Ecology			
Marine Mammals			
Terrestrial Ecology			
Landscape, Seascape and Visual			
In-air Noise & Vibration			
Soils, Geology and Palaeontology			
Hydrology, Hydrogeology and Coastal Processes			
Population, Human Health and Socio - Economic			
Natural Resource Usage and Waste			
Traffic and Access			
Navigation			
Major Accidents and Disasters			

Key

	Negligible/No Effect – Scoped Out
	Potential Effect – Scoped out as they can be easily mitigated by measures proposed
	Potential Effect – Scoped In

17 References

Ancient Monuments and Archaeological Areas Act, 1979 (c46). London. The Stationery Office. Retrieved from: http://www.legislation.gov.uk/ukpga/1979/46/pdfs/ukpga_19790046_en.pdf. Accessed on 24 February 2021.

Chanin P (2003). Monitoring the Otter Lutra lutra. Conserving Natura 2000 Rivers Monitoring Series No. 10, English Nature, Peterborough.

Department for Transport (DfT). 2020. Road Traffic Statistics. Retrieved from https://roadtraffic.dft.gov.uk/#8/57.613/-6.177/basemap-localauthorities-countpoints. Accessed on 1 March 2021.

Environmental 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/

Environmental Agency. 2017. Guidance - Water Framework Directive Assessment: estuarine and Coastal Waters. Retrieved from https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters

Evans, P. G. H. and James, K. 2016. Status of Cetaceans in the Vicinity of the Isle of Skye. Retrieved from: Microsoft Word - SKYE EIA (marine.gov.scot).

European Parliament (2000). European Water Framework Directive. Retrieved from: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060

Gittings, B.M. 2012. The Gazetteer for Scotland, http://www.scottish-places.info/. Accessed on 1 Mach 2021.

IAQM. 2014. Guidance on the Assessment of Dust from Demolition and Construction. Institution of Environmental Sciences, London, UK.

ICOMOS. 2005. Xi'an Declaration. Retrieved from https://www.icomos.org/xian2005/xian-declaration.htm. Accessed on 24 February 2021.

ICOMOS. 2013. The Burra Charter 2013: Article 1.2. retrieved from https://australia.icomos.org/publications/charters/. Accessed on 24 February 2021.

IEMA. 2017. Environmental Impact Assessment Guide. Retrieved from https://www.iema.net/assets/newbuild/documents. Accessed on 24 February 2021.

IQAir. 2021. Air Quality in Scotland. Air quality index (AQI) and PM2.5 air pollution in Scotland. Retrieved from https://www.iqair.com/uk/scotland. Accessed on 26 February 2021.

JNCC. 2010. Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit. Joint Nature Conservation Committee, Peterborough.

Marine Scotland. 2021a. BGS – Seabed Geology Layers. Retrieved from http://marine.gov.scot/information/bgs-seabed-geology-layers

Marine Scotland. 2021b. Marine Scotland All Applications. Retrieved at http://marine.gov.scot/marine-licence-applications. Accessed on 23 February 2021. National Biodiversity Network (NBN). 2021. Retrieved from: https://nbnatlas.org/.

National Health Services (NHS). 2019. Highland Public Health Skye and Lochalsh '*Population and demography*'.

National Map Library. 2021. National Library of Scotland, Causewayside, Edinburgh. Retrieved from https://maps.nls.uk/. Accessed on 24 February 2021.

National Records of Scotland. April 2020. Highland Council Area Profile. Retrieved from https://www.nrscotland.gov.uk/files//statistics/council-area-data-sheets/highland-council-profile.html

National Marine Plan Interactive. 2020. Retrieved from: Marine Scotland - National Marine Plan Interactive (atkinsgeospatial.com)

NatureScot. 2020a. Protected species: Dolphins, whales and porpoises: Dolphins, whales and porpoises | NatureScot

NatureScot 2020b. Standing Advice for Planning Consultations. Protected Species: Otters.

Organic Sea Harvest. 2021. Skye Fish Farm denied Approval. Published 26th January 2021. Retrieved from https://organicseaharvest.co.uk/skye-fish-farm-denied-approval.html

Pastmaps. 2021. Exploring Scotland's Historic Environment. Retrieved from https://www.pastmap.org.uk/. Accessed on 24 February 2021.

Ports and Harbours of the UK. 2021. Retrieved from http://www.ports.org.uk/port.asp?id=459. Accessed 23 February 2021.

Saunders, G., Bedford, G., Trendall, J., and Sotheran, I. 2011. Guidance on survey and monitoring in relation to marine renewables deployments in Scotland. Volume 5. Benthic Habitats. Unpublished draft report to Scottish Natural Heritage and Marine Scotland.

Scottish Environmental protection Agency (SEPA) 2021a). Flood Maps. Retrieved at https://map.sepa.org.uk/floodmap/map.htm. Accessed 12 March 2021.

SEPA. 2021b. Water Classification Hub. Accessed from https://www.sepa.org.uk/data-visualisation/water-classification-hub/. Accessed on 23 March 2021.

Scottish Government, 1996. Planning Advice Note. PAN 50: controlling the environmental effects of surface mineral workings.

Scottish Government. 2011. Planning Advice Notice. PAN2/2011. Planning and Archaeology.

Scottish Government. 2020. Scottish Planning Policy. Retrieved from scottish-planning-policy.pdf. Accessed on 24 February 2021.

Scottish Government. 2021a, EUNIS Habitat Map of Scotland. Accessed on 12 March 2021.

Scottish Government. 2021b, Carbon and Peatland Map 2016 Map. Accessed on 12 March 2021.

Scottish Natural Heritage & Historic Environment Scotland. 2018. Environmental Impact Assessment Handbook v5. Retrieved from https://www.nature.scot/sites/default/files/2018-05/Publication%202018%20-%20Environmental%20Impact%20Assessment%20Handbook%20V5.pdf. Accessed on 24 February 2021.

Skye Ecomuseum. 2020. Lazy Highlander stereotype a "dastardly lie", insisted diatomite boss. Retrieved from https://skyeecomuseum.com/stories/story-2

The Highland Council. 2012. Highland Wide Local Development Plan. Retrieved on https://www.highland.gov.uk/info/178/local_and_statutory_development_plans/199/highland-wide_local_development_plan. Accessed on 24 February 2021.

The Highland Council. 2012. Highland Wide Local Development Plan. Retrieved from https://www.highland.gov.uk/info/178/local_and_statutory_development_plans/199/highland-wide_local_development_plan. Accessed on 24 February 2021.

The Highlands Council. 2013. Highland Historic Environment Strategy. Retrieved on https://www.highland.gov.uk/downloads/file/11047/highland_historic_environment_strategy. Accessed on 24 February 2021.

The Highlands Council. 2019. West Highland and Islands Local Development Plan. Retrieved from https://www.highland.gov.uk/downloads/file/21199/westplan_adopted_september_2019. Accessed on 24 February 2021.

The Highland Council 2021. Planning Permission. Planning Applications. Retrieved from https://www.highland.gov.uk/info/180/planning_-_applications_warrants_and_certificates/143/planning_permission/4. Accessed on 23 February 2021.

United Kingdom Hydrographic Office (UKHO), 2021. Marine Data Portal. Retrieved from https://datahub.admiralty.co.uk/portal/apps/sites/#/marine-data-portal. Accessed on 24 February 2021.

UKGE Limited, 2017. Voltas. Retrieved from https://ukfossils.co.uk/2011/05/02/valtos/. Accessed on 12 March 2021.

18 Glossary

AA	Appropriate Assessment
ADD	Acoustic Deterrent Devices
AOD	Above Ordnance Datum
ATC	Automatic Traffic Count
AToN	Aids to Navigation
CD	Chart Datum
CTMP	Construction Traffic Management Plan
DtT	Department for Transport
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPS	European Protected Species
GCR	Geological Conservation Review
GHG	Greenhouse Gases
GWDTE	Groundwater-Dependent Terrestrial Ecosystems
HRA	Habitats Regulation Assessment
JNCC	Joint Nature Conservation Committee
km	kilometres
LLA	Local Landscape Area's
m	metres
MHWS	Mean High Water Spring
MLWS	Mean Low Water Spring
MPA	Marine Protected Areas
NBN	National Biodiversity Network
NCO	Nature Conservation Order
NRTF	National Road Traffic Forecasts
NSA	National Scenic Areas
PAC	Pre-application Consultation
PAN	Planning Advice Notice
PM	Particulate Matter
SAC	Special Areas of Conservation
SCH	Staffin Community Harbour
SCT	Staffin Community Trust
SEPA	Scottish Environment Protection Agency
SLA	Special Landscape Areas
SNH	Scottish Natural Heritage
SoM	Schedule of Mitigation
SPA	Special Protection Areas
SSSI	Sites of Special Scientific Interest
WFD	Water Framework Directive

Appendix A: Water Framework Directive Assessment Scoping

Use this template to record the findings of the scoping stage of your Water Framework Directive (WFD) assessment for an activity in an estuary or coastal water.

If your activity will:

- take place in or affect more than one water body, complete a template for each water body
- include several different activities or stages as part of a larger project, complete a template for each activity as part of your overall WFD assessment

The WFD assessment guidance for estuarine and coastal waters will help you complete the table.

Your activity	Description, notes or more information
Applicant name	Staffin Community Trust
Application reference number (where applicable)	Not Applicable
Name of activity	Staffin Community Harbour Development
Brief description of activity	The proposed Staffin Community Harbour development comprises of the upgrading of the existing slipway, construction of a new breakwater and pontoon, land reclamation to allow for onshore infrastructure (including parking, toilets and storage sheds).
Location of activity (central point XY coordinates or national grid reference)	Harbour development: NG494 681 Borrow Pit: NG51879 60595
Footprint of activity (ha)	>2ha
Timings of activity (including start and finish dates)	Not yet known
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	Refer to Section 2, Proposed Development in the Scoping Report.
Use or release of chemicals (state which ones)	None

Water body[1]	Description, notes or more information
WFD water body name	North Skye
Water body ID	200493
River basin district name	Scotland
Water body type (estuarine or coastal)	Coastal
Water body total area (ha)	356.6 km2 / 35660 ha
Overall water body status	Good
Ecological status	Good
Chemical status	High
Target water body status and deadline	Good (2021 & 2027)
Hydromorphology status of water body	High
Heavily modified water body and for what use	No
Higher sensitivity habitats present	Yes – subtidal kelp beds
Lower sensitivity habitats present	Yes – rocky shore
Phytoplankton status	High
History of harmful algae	No
WFD protected areas within 2km	No

[1] Water body information can be found in the Environment Agency's catchment data explorer and the water body summary table. Magic maps provide additional information on habitats and protected areas. Links to these information sources can be found in the WFD assessment guidance for estuarine and coastal waters.

Water body	Description, notes or more information
WFD water body name	Stenscholl River
Water body ID	20701
River basin district name	Scotland
Water body type (estuarine or coastal)	Coastal
Water body total area (ha)	Main stem 13,5 km
Overall water body status	Good
Ecological status	Good
Chemical status	High
Target water body status and deadline	Good (2021 & 2027)
Hydromorphology status of water body	Good
Heavily modified water body and for what use	No
Higher sensitivity habitats present	None
Lower sensitivity habitats present	None
Phytoplankton status	N/A
History of harmful algae	No
WFD protected areas within 2km	No

Water body	Description, notes or more information
WFD water body name	River Lealt
Water body ID	20702
River basin district name	Scotland
Water body type (estuarine or coastal)	Coastal
Water body total area (ha)	Main stem 11.3 km
Overall water body status	Moderate
Ecological status	Moderate
Chemical status	High
Target water body status and deadline	Good (2021 & 2027)
Hydromorphology status of water body	Moderate
Heavily modified water body and for what use	No
Higher sensitivity habitats present	None
Lower sensitivity habitats present	None
Phytoplankton status	N/A
History of harmful algae	No
WFD protected areas within 2km	No

Specific risk information

Consider the potential risks of your activity to each of these receptors: hydromorphology, biology (habitats and fish), water quality and protected areas. Also consider invasive non-native species (INNS).

Section 1: Hydromorphology

Consider if hydromorphology is at risk from your activity.

Use the water body summary table to find out the hydromorphology status of the water body, if it is classed as heavily modified and for what use.

North Skye Water Body

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status	Requires impact assessment	Impact assessment not required	Yes – the proposed project involves land reclamation activities and the development of the breakwater and slipway which may alter tidal patterns.
Could significantly impact the hydromorphology of any water body	Requires impact assessment	Impact assessment not required	No
Is in a water body that is heavily modified for the same use as your activity	Requires impact assessment	Impact assessment not required	No

Stenscholl River

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status	Requires impact assessment	Impact assessment not required	No – the proposed project will not involve activities in or in close enough proximity to the Stensholl River.

Could significantly impact the hydromorphology of any water body	Requires impact assessment	Impact assessment not required	No
Is in a water body that is heavily modified for the same use as your activity	Requires impact assessment	Impact assessment not required	No

River Lealt

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status	Requires impact assessment	Impact assessment not required	No – the proposed project will not involve activities in or in close enough proximity to the River Lealt.
Could significantly impact the hydromorphology of any water body	Requires impact assessment	Impact assessment not required	No
Is in a water body that is heavily modified for the same use as your activity	Requires impact assessment	Impact assessment not required	No

Section 2: Biology

Habitats

Consider if habitats are at risk from your activity.

Use the water body summary table and Magic maps, or other sources of information if available, to find the location and size of these habitats.

Higher sensitivity habitats [2]	Lower sensitivity habitats [3]
chalk reef	cobbles, gravel and shingle
clam, cockle and oyster beds	intertidal soft sediments like sand and mud
intertidal seagrass	rocky shore
maerl	subtidal boulder fields
mussel beds, including blue and horse mussel	subtidal rocky reef
polychaete reef	subtidal soft sediments like sand and mud
saltmarsh	
subtidal kelp beds	
subtidal seagrass	

[2] *Higher sensitivity habitats have a low resistance to, and recovery rate, from human pressures.*

[3] *Lower sensitivity habitats have a medium to high resistance to, and recovery rate from, human pressures.*

North Skye Water Body

Consider if the footprint[4] of your activity is:	Yes	No	Biology habitats risk issue(s)
0.5km^2 or larger	Yes to one or more – requires impact assessment	No to all – impact assessment not required	No
1% or more of the water body's area			No
Within 500m of any higher sensitivity habitat			Yes – subtidal kelp beds.
1% or more of any lower sensitivity habitat			No

[4] *Note that a footprint may also be a temperature or sediment plume. For dredging activity, a footprint is 1.5 times the dredge area.*

Stenscholl River

Consider if the footprint[4] of your activity is:	Yes	No	Biology habitats risk issue(s)
0.5km^2 or larger	Yes to one or more – requires impact assessment	No to all – impact assessment not required	No
1% or more of the water body's area			No
Within 500m of any higher sensitivity habitat			No
1% or more of any lower sensitivity habitat			No

River Lealt

Consider if the footprint[4] of your activity is:	Yes	No	Biology habitats risk issue(s)
0.5km^2 or larger	Yes to one or more – requires impact assessment	No to all – impact assessment not required	No
1% or more of the water body's area			No
Within 500m of any higher sensitivity habitat			No
1% or more of any lower sensitivity habitat			No

Fish

Consider if fish are at risk from your activity, but only if your activity is in an estuary or could affect fish in or entering an estuary.

North Skye Water Body

Consider if your activity:	Yes	No	Biology fish risk issue(s)
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary	Continue with questions	Go to next section	No
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)	Requires impact assessment	Impact assessment not required	No
Could cause entrainment or impingement of fish	Requires impact assessment	Impact assessment not required	No

Stenscholl River

Consider if your activity:	Yes	No	Biology fish risk issue(s)
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary	Continue with questions	Go to next section	No

Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)	Requires impact assessment	Impact assessment not required	No
Could cause entrainment or impingement of fish	Requires impact assessment	Impact assessment not required	No

River Lealt

Consider if your activity:	Yes	No	Biology fish risk issue(s)
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary	Continue with questions	Go to next section	No
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)	Requires impact assessment	Impact assessment not required	No
Could cause entrainment or impingement of fish	Requires impact assessment	Impact assessment not required	No

Record the findings for biology habitats and fish and go to section 3: water quality.

Section 3: Water quality

Consider if water quality is at risk from your activity.

Use the water body summary table to find information on phytoplankton status and harmful algae.

North Skye Water Body

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)	Requires impact assessment	Impact assessment not required	No
Is in a water body with a phytoplankton status of moderate, poor or bad	Requires impact assessment	Impact assessment not required	No – the water body has a 'High' status.
Is in a water body with a history of harmful algae	Requires impact assessment	Impact assessment not required	No

Stenscholl River

Consider if your activity:	Yes	No	Biology fish risk issue(s)
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary	Continue with questions	Go to next section	No
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier,	Requires impact assessment	Impact assessment not required	No

noise, chemical change or a change in depth or flow)			
Could cause entrainment or impingement of fish	Requires impact assessment	Impact assessment not required	No

River Lealt

Consider if your activity:	Yes	No	Biology fish risk issue(s)
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary	Continue with questions	Go to next section	No
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)	Requires impact assessment	Impact assessment not required	No
Could cause entrainment or impingement of fish	Requires impact assessment	Impact assessment not required	No

Consider if water quality is at risk from your activity through the use, release or disturbance of chemicals.

North Skye Water Body

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the Environmental Quality Standards Directive (EQSD) list	Requires impact assessment	Impact assessment not required	Yes – there is the potential for a loss of fuels and oils during both construction and operation should they be inappropriately handled.
It disturbs sediment with contaminants above Cefas Action Level 1	Requires impact assessment	Impact assessment not required	No

Stenscholl River

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the Environmental Quality Standards Directive (EQSD) list	Requires impact assessment	Impact assessment not required	No – River too far from development to be impacted by any loss of containment of fuels or oils during construction or operations.
It disturbs sediment with contaminants above Cefas Action Level 1	Requires impact assessment	Impact assessment not required	No

River Lealt

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the Environmental Quality Standards Directive (EQSD) list	Requires impact assessment	Impact assessment not required	No – River too far from development to be impacted by any loss of containment of fuels or oils during construction or operations.
It disturbs sediment with contaminants above Cefas Action Level 1	Requires impact assessment	Impact assessment not required	No

North Skye Water Body

If your activity has a mixing zone (like a discharge pipeline or outfall) consider if:	Yes	No	Water quality risk issue(s)
The chemicals released are on the Environmental Quality Standards Directive (EQSD) list	Requires impact assessment[5]	Impact assessment not required	No

[5] *Carry out your impact assessment using the Environment Agency's surface water pollution risk assessment guidance, part of Environmental Permitting Regulations guidance.*

Stenscholl River

If your activity has a mixing zone (like a discharge pipeline or outfall) consider if:	Yes	No	Water quality risk issue(s)

The chemicals released are on the Environmental Quality Standards Directive (EQSD) list	Requires impact assessment[5]	Impact assessment not required	No

River Lealt

If your activity has a mixing zone (like a discharge pipeline or outfall) consider if:	Yes	No	Water quality risk issue(s)
The chemicals released are on the Environmental Quality Standards Directive (EQSD) list	Requires impact assessment[5]	Impact assessment not required	No

Record the findings for water quality go on to section 4: WFD protected areas.

Section 4: WFD protected areas

Consider if WFD protected areas are at risk from your activity. These include:

- special areas of conservation (SAC)
- special protection areas (SPA)
- shellfish waters
- bathing waters
- nutrient sensitive areas

Use Magic maps to find information on the location of protected areas in your water body (and adjacent water bodies) within 2km of your activity.

North Skye Water Body

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within 2km of any WFD protected area[6]	Requires impact assessment	Impact assessment not required	No

[6] *Note that a regulator can extend the 2km boundary if your activity has an especially high environmental risk.*

Stenscholl River

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within 2km of any WFD protected area[6]	Requires impact assessment	Impact assessment not required	No

River Lealt

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within 2km of any WFD protected area[6]	Requires impact assessment	Impact assessment not required	No

Record the findings for WFD protected areas and go to section 5: invasive non-native species.

Section 5: Invasive non-native species (INNS)

Consider if there is a risk your activity could introduce or spread INNS.

Risks of introducing or spreading INNS include:

- materials or equipment that have come from, had use in or travelled through other water bodies
- activities that help spread existing INNS, either within the immediate water body or other water bodies

North Skye Water Body

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	Requires impact assessment	Impact assessment not required	No

Stenscholl River

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	Requires impact assessment	Impact assessment not required	No

River Lealt

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	Requires impact assessment	Impact assessment not required	No

Record the findings for INNS and go to the summary section.

Summary

Summarise the results of scoping here.

North Skye Water Body

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	Yes	Yes – the proposed project involves land reclamation activities and the development of the breakwater and slipway which may alter tidal patterns.
Biology: habitats	Yes	Yes – subtidal kelp beds.
Biology: fish	No	N/A
Water quality	Yes	the proposed project will not involve activities in or in close enough proximity to the Stensholl River.
Protected areas	No	N/A
Invasive non-native species	No	N/A

Stenscholl River

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	The proposed project will not involve activities in or in close enough proximity to the Stensholl River.
Biology: habitats	No	N/A
Biology: fish	No	N/A
Water quality	No	N/A
Protected areas	No	N/A

Invasive non-native species	No	N/A

River Lealt

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	The proposed project will not involve activities in or in close enough proximity to the River Lealt.
Biology: habitats	No	N/A
Biology: fish	No	N/A
Water quality	No	N/A
Protected areas	No	N/A
Invasive non-native species	No	N/A

If you haven't identified any receptors at risk during scoping, you don't need to continue to the impact assessment stage and your WFD assessment is complete.

If you've identified one or more receptors at risk during scoping, you should continue to the impact assessment stage.

Include your scoping results in the WFD assessment document you send to your activity's regulator as part of your application for permission to carry out the activity.

Appendix F.1: Gazeteer Report

Wallace Stone
Consulting Civil Engineers

DAL
DALGLEISH
ASSOCIATES
LIMITED

Site Gazeteer

Site Number	1
Site Name	Skye, Stenscholl, War Memorial
Type of Site	War Memorial (20th Century)
NRHE Number	NG46NE 52
HER Number	
Status	Non-designated asset
Easting	148347
Northing	868032
Parish	Kilmuir
Council	Highland
Description	Canmore ID: NG46NE 52 NG46NE 52 48347 68032 War Memorial [NAT] OS (GIS) AIB, August 2008. AOC Notes: this record needs to be checked.

Site Number	2
Site Name	Skye, Stenscholl, Wooden Bridge
Type of Site	Road Bridge (Period Unassigned)
NRHE Number	NG46NE 18
HER Number	MHG6496
Status	Non-designated asset
Easting	148514
Northing	868158
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 11348 NG46NE 18 48514 68158 Location formerly cited as NG 4850 6816. (Location cited as NG 485 682). Wooden bridge, Staffin: early 20th century. A 2-span wooden bridge, with concrete abutments. J R Hume 1977. This bridge carries an unnumbered public road over the Stenscholl River a short distance above its debouchement into Staffin Bay. Information from RCAHMS (RJCM), 5 August 2008.

References
Hume, J R. (1977a) The industrial archaeology of Scotland, 2, the Highlands and Islands. London. Page(s): 217 RCAHMS Shelf Number: J.4.11.HUM

Site Number	3
Site Name	Staffin Bay, Fo Foid Na Time
Type of Site	Flint Scatter (Mesolithic), Organic Material(S) (Period Unassigned), Organic Material (Bone)(Peri
NRHE Number	NG46NE 54
HER Number	
Status	Non-designated asset
Easting	148602
Northing	868337
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 355344

Archaeological Evaluation (9 September 2015 - 14 September 2015)

NG 48602 68337 This community led partnership investigated a suspected Mesolithic site above the beach at the eastern end of Staffin Bay, 9–14 September 2015. The trust wishes to develop their Ecomuseum (http://www.skyecomuseum. co.uk/) and enhance knowledge about key sites in the Staffin landscape. This site has long been known as a source of eroding Mesolithic material and was recently recorded in a walkover survey by RoCAS (DES 2014, 113). This coast was also extensively surveyed during the Scotland's First Settlers Project which identified numerous flint scatters along the bay (NG46NE 34) and is home to the An Corran rock shelter which contained Mesolithic material (NG46NE 19). At the site, the remains of a low circular stone wall overlay an erosion scar which has yielded numerous lithics at the edge of a slight promontory.

Resistance survey and ground penetrating radar were used to define the structures wall and internal area, and also picked up the lazy beds to the S. Topographic survey was used to create a contour plan. Test pits were dug to the S of the site. The topsoil in the pits contained numerous lithics, showing that Mesolithic activity may have occurred over a wide area. A small evaluation trench (5 x 2m) across the wall demonstrated that Mesolithic activity focused on the slight promontory. Several hundred lithics, including flakes, blades, cores, scrapers and debitage, were recovered from a buried topsoil horizon below the structure. This layer survived in pockets amongst bedrock outcrops. Along with the lithics, a small fragment of worked bone was found in the upper part of the same layer. Numerous charred hazelnut shells suitable for AMS dating were also recovered from bulk samples. No evidence for domestic activity, such as hearths or floor deposits, was found and the circular structure (perhaps a small enclosure) and nearby lazy beds, are likely to date to the post-medieval period. This activity has sealed the Mesolithic horizon on the promontory and protected it from erosion, apart from the recent cattle poaching along the edge.

The site may have been one place amongst many along Staffin Bay where hunter gatherers congregated and worked stone, perhaps exploiting resources such as fish and mammals at the river mouth.

Archive: Archaeology Institut e, University of the Highlands and Islands

Funder: Scottish Funding Council (Interface), Highland Council and Carnegie Trust New York

Daniel Lee and Dugald Ross – Archaeology Institute, UHI and Staffin Community Trust

(Source: DES, Volume 16)

References

Lee and Ross, D and D. (2016) Fo Foid na Time, Staffin Bay, Survey and excavation, Discovery Excav Scot, New, vol. 16, 2015. Cathedral Communications Limited, Wiltshire, England. Page(s): 108

Site Number	4
Site Name	Skye, An Corran
Type of Site	Flint Scatter(S) (Prehistoric), Midden(S) (Period Unassigned)
NRHE Number	NG46NE 33
HER Number	MHG35899
Status	Non-designated asset
Easting	148770
Northing	868400
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 158019

NG46NE 33 centred 4877 6840

The following sites were recorded between January and September 1999 as part of the Scotland's First Settlers Project. A full report has been lodged with the NMRS.

NG 4885 6851 An Corran B Lithic scatter. +

NG 4877 6840 An Corran C Lithic scatter. +

NG 4864 6836 An Corran D Lithic scatter. +

Note: + = containing visible midden

Sponsors: British Academy, Society of Antiquaries of Scotland, Society of Antiquaries of London, Percy Hedley Trust, Russell Trust, Prehistoric Society, Applecross Trust.

B Finlayson, K Hardy and C Wickham-Jones 1999

The following sites were recorded between October 1999 and May 2000 as part of the Scotland's First Settlers Project (DES 1999, 49-50):

NG 4890 6838 An Corran E Lithic scatter.

A full report has been lodged with the NMRS.

Sponsors: Historic Scotland, Society of Antiquaries of Scotland, Society of Antiquaries of London, Prehistoric Society, Russell Trust, Applecross Estates Trust, Munro Fund, University of Edinburgh, Ross and Cromarty Enterprise, Leader 11, CFA, private donations.

K Hardy and C Wickham-Jones 2000.

References

Bonsall, C. (1997) 'Coastal adaption in the Mesolithic of Argyll. Rethinking the "Obanian Problem" ', in Ritchie, G, The archaeology of Argyll. Edinburgh. Page(s): 28-29, 32 RCAHMS Shelf Number: E.2.1.RIT
Finlayson, Hardy and Wickham-Jones, B, K and C. (1999) 'Inner Sound (Applecross; Kilmuir; Portree; Snizort; Strath parishes), Survey and trial excavation', Discovery Excav Scot, 1999. Page(s): 49-50
Hardy and Wickham-Jones, K and C. (2000) 'Inner Sound, Highland, survey and excavation', Discovery Excav Scot, vol. 1, 2000. Page(s): 45

NG46NE 33 centred 4877 6840

The following sites were recorded between January and September 1999 as part of the Scotland's First Settlers Project. A full report has been lodged with the NMRS.
NG 4885 6851 An Corran B Lithic scatter. +
NG 4877 6840 An Corran C Lithic scatter. +
NG 4864 6836 An Corran D Lithic scatter. +
Note: + = containing visible midden
B Finlayson, K Hardy and C Wickham-Jones 1999

The following sites were recorded between October 1999 and May 2000 as part of the Scotland's First Settlers Project (DES 1999, 49-50):
NG 4890 6838 An Corran E Lithic scatter.
A full report has been lodged with the NMRS.
K Hardy and C Wickham-Jones 2000

The Scotland's First Settlers survey work in 1999, 2000 and 2001 resulted in the recording of a suite of open- air lithic scatter sites around the bay at Staffin, starting from the area between An Corran rockshelter (An Corran A, SFS 1, see MHG6497) and the sea and working northwards. These have been named An Corran B-G. In addition there is a site at Brogaig, also in Staffin Bay.
B: NG 4885 6851 (SFS 29)
C: NG 4877 6840 (SFS 30)
D: NG 4864 6836 (SFS 31)
E: NG 4890 6838 (SFS 101)
F: NG 4861 6827 (SFS 193)
G: NG 4853 6815 (SFS 194)
Brogaig : NG 4730 6871 (SFS 32)
The An Corran sites and Brogaig are still eroding so that most visits result in the recovery of further material. Monitoring took place at irregular intervals throughout the project but, due to the constraints of time and money, a halt to monitoring work was called with the result that the catalogue of lithic material is only a sample of what was recovered (and what might be found in future).
The quantity of lithic finds from each site varies greatly. Raw materials reflect the local availability of baked mudstone and chalcedonic silica, though it is interesting that some assemblages have more baked mudstone, while others have more chalcedonic silica. Quartz is present in a very small quantity and in addition there are a few pieces of Rùm bloodstone and volcanic glass. Most of the sites have both debitage and regular pieces. Narrow blade microliths were recovered from three sites – An Corran C, E and F – and most sites also had larger modified tools as well, mainly edge-retouched pieces and scrapers. In addition, blades were found on all sites except for F, G and A, though at G and A the assemblage only comprised of isolated finds.
There were three sherds of pottery: one from An Corran C and two from An Corran E. A single, undiagnostic, rimsherd was found at An Corran C, but the two pieces from An Corran E include a sherd of Unstan ware, dating to the earlier part of the Neolithic.
Dating material was not recovered during SFS work apart from the general characterisation of the flaked lithics. Mesolithic material, in the form of microliths, came from three of the sites (C, E & F), while three others had blades, but no microliths. Although it is obvious that by and large the microliths came from the larger assemblages (C & E), sites B, D and Brogaig also had good-sized collections and it is likely that microliths would have been spotted had they been present. The rockshelter site at An Corran A has evidence of activity from the Early Mesolithic into the Neolithic and in this respect the generally undiagnostic nature of several of the lithic

assemblages is noteworthy. <1>

Sources/Archives (1)

<1> Text/Publication/Monograph: Hardy, K and Wickham-Jones, C (eds). 2007. Mesolithic and later sites around the Inner Sound, Scotland: the work of the Scotland's First Settlers project 1998-2004, Scottish Archaeological Internet Reports 31. Scottish Archaeological Internet Report. 31. Digital. Section 2.2.7, B-G.

Site Number	5
Site Name	Skye, An Corran
Type of Site	Cave (Period Unassigned)
NRHE Number	NG46NE 44
HER Number	MHG38823
Status	Non-designated asset
Easting	148910
Northing	868540
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 231080

Site Number	6
Site Name	Skye, An Corran
Type of Site	Shell Midden (Period Unassigned), Flake (Chert), Point (Flint)
NRHE Number	NG46NE 19
HER Number	
Status	Non-designated asset
Easting	149000
Northing	868500
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 11349

NG46NE 19 490 685

Immediately S of An Corran and on a ledge to the west of the road leading to Staffin slipway is a shell-midden (Patella Vulgata and Littorina Litorea) together with burnt bone. A flint point and a chert flake were picked from the surface.

Visited by R Miket, 12 May 1988.

NG 491 684. Salvage investigation took place during December 1993/January 1994 of a ledge at the base of E-facing cliffs in advance of rock-blasting for road works. Disturbed upper levels contained the remains of numerous hearths and fires but the only datable finds were a mid 19th-century glass bottle and a bronze pin of Early Iron Age type.

An underlying shell midden contained a very important Mesolithic assemblage of bone and lithic tools, as well as abundant faunal remains. A radiocarbon determination of 7590 ? 90 BP (OxA-4994) has been obtained on one of the bevel-ended tools, made on a red deer bone. The lithic industry, using locally available silicious and basaltic materials, included the manufacture of microliths by microburin technique.

About one-fifth of the rock-shelter deposits were examined, but the ledge itself has been preserved despite removal of the cliff.

Sponsors: Skye & Lochalsh District Council Museums Service, Highland Region Roads Department, NMS.

A Saville and R Miket 1994.

References

Armit, I. (1996) The archaeology of Skye and the Western Isles. Edinburgh. Page(s): 14, 34-6 RCAHMS Shelf Number: E.2.1.ARM
Bonsall, C. (1997) 'Coastal adaption in the Mesolithic of Argyll. Rethinking the "Obanian Problem" ', in Ritchie, G, The archaeology of Argyll. Edinburgh. Page(s): 28-29, 32 RCAHMS Shelf Number: E.2.1.RIT
Finlayson and Edwards, B and K J. (2003) 'The Mesolithic', in Edwards, K J and Ralston, I B M, Scotland after the Ice Age: environment, archaeology and history 8000BC - AD 1000. 2nd. Edinburgh. Page(s): 117, 119, 121
Gannon and Geddes, A and G. (2015) St Kilda: The Last and Outmost Isle. Edinburgh.
Larsson, Kindgren, Knutsson, Loeffler and Akerlund, L, H, K, D and A. (2003) Mesolithic on the move: papers presented at the sixth international conference on the mesolithic in Europe, Stockholm 2000. Oxford. Page(s): 11-19 RCAHMS Shelf Number: E.6.LAR
Saville and Miket, A and R. (1994) 'An Corran, Staffin, Skye (Kilmuir parish): rock-shelter', Discovery Excav Scot, 1994. Page(s): 40-1 photograph: fig. 19
Wildgoose, M. (1988) 'An Choran (Kilmuir parish), shell midden, flints', Discovery Excav Scot, 1988. Page(s): 17

Site Number	7
Site Name	Skye, Staffin Island
Type of Site	Building(S) (Period Unassigned), Wall (Period Unassigned)
NRHE Number	NG46NE 30
HER Number	MHG25923
Status	Non-designated asset
Easting	149120
Northing	868910
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 114678

First Edition Survey Project (FESP)

An unroofed building is depicted on the 1st edition of the OS 6-inch map (Inverness-shire, Island of Skye 1879, sheet vii). Two roofed buildings and a wall are shown on the current edition of the OS 1:10560 map (1968).

Information from RCAHMS (SAH) 7 October 1996

Site Gazeteer

Site Number	8
Site Name	Skye, Staffin Island
Type of Site	Flint Scatter (Prehistoric), Midden (Period Unassigned)
NRHE Number	NG46NE 35
HER Number	MHG35901
Status	Non-designated asset
Easting	149200
Northing	868850
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 158027 NG46NE 35 4920 6885 The following site was recorded between January and September 1999 as part of the Scotland's First Settlers Project. A full report has been lodged with the NMRS. NG 4920 6885 Staffin Island Lithic scatter. + Note: + = containing visible midden Sponsors: British Academy, Society of Antiquaries of Scotland, Society of Antiquaries of London, Percy Hedley Trust, Russell Trust, Prehistoric Society, Applecross Trust. B Finlayson, K Hardy and C Wickham-Jones 1999 NGR given as NG 4915 6887 in Scotland's First Settlers Data Structure Report 1999 (MS/726/171) References Finlayson, Hardy and Wickham-Jones, B, K and C. (1999) 'Inner Sound (Applecross; Kilmuir; Portree; Snizort; Strath parishes), Survey and trial excavation', Discovery Excav Scot, 1999. Page(s): 49-50 G46NE 35 4920 6885 The following site was recorded between January and September 1999 as part of the Scotland's First Settlers Project. A full report has been lodged with the NMRS. NG 4920 6885 Staffin Island Lithic scatter. + Note: + = containing visible midden B Finlayson, K Hardy and C Wickham-Jones 1999 NGR given as NG 4915 6887 in Scotland's First Settlers Data Structure Report 1999 (MS/726/171) Staffin Island was investigated as part of the Scotland's First Settlers Project in 1999. It lies just offshore from Staffin Bay and the excavated site of SFS 1, An Corran (MHG6497). It comprised a soil cliff with lithics eroding out of it. There were seven surface finds, all of chalcedonic silica except for a single regular flake of baked mudstone. These comprised six regular flakes and a large platform core which had not been exhausted. The lithics indicate activity in the past, perhaps in prehistory. <1> Sources/Archives (1) <1> Text/Publication/Monograph: Hardy, K and Wickham-Jones, C (eds). 2007. Mesolithic and

later sites around the Inner Sound, Scotland: the work of the Scotland's First Settlers project 1998-2004, Scottish Archaeological Internet Reports 31. Scottish Archaeological Internet Report. 31. Digital. Section 2.2.67, SFS 36.

Site Number	9
Site Name	Skye, Staffin, Ob Nan Ron, Slipway And Storehouse
Type of Site	Slipway (Period Unassigned), Storehouse (Period Unassigned)
NRHE Number	NG46NE 36
HER Number	
Status	Non-designated asset
Easting	149460
Northing	868170
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 160459 NG46NE 36 4946 6817 See also NG46NE 37. (Location cited as NG 494 682). Staffin Slip: a long well built, drystone ramped jetty. At the pier head are a small 1-storey store, and a series of rubble enclosures for boat storage. J R Hume 1977. References Hume, J R. (1977a) The industrial archaeology of Scotland, 2, the Highlands and Islands. London. Page(s): 217 RCAHMS Shelf Number: J.4.11.HUM

Site Number	10
Site Name	Skye, Staffin, Ob Nan Rob, Boat Shelters
Type of Site	Naust (Period Unassigned)
NRHE Number	NG46NE 37
HER Number	MHG35160
Status	Non-designated asset
Easting	149430
Northing	868100
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 160471 NG46NE 37 4943 6810 See also NG46NE 36.

References
Hume, J R. (1977a) The industrial archaeology of Scotland, 2, the Highlands and Islands. London. Page(s): 217 RCAHMS Shelf Number: J.4.11.HUM

Site Number	11
Site Name	Garafad,Depopulated Settlement,Kilmuir
Type of Site	Field System (Period Unassigned), Head Dyke (Post Medieval), Township (Period Unassigned)
NRHE Number	NG46NE 9
HER Number	MHG5748
Status	Scheduled Monument
Easting	149300
Northing	867800
Parish	Kilmuir
Council	Highland
Description	SM3510

Canmore ID: 11357, coordinates: 149300, 867800

From Canmore:

NG46NE 9 centred 493 678.

NG 493 678: A depopulated township (? Garrafad) comprising 22 ruined houses (2 overlain by modern sheep-dipping pens) and some outbuildings.

Visited by OS (A S P) 25 April 1961.

A township comprising three roofed, two unroofed buildings, an unroofed structure, some field walls and a head-dyke is depicted on the 1st edition of the OS 6-inch map (Inverness-shire, Island of Skye 1880, sheet viii). A field-system lies approximately 400m to the E of the buildings (NG 497 678).

Ten unroofed buildings, three enclosures, one of which has four compartments, a sheepfold, some field walls, a field-system and a head-dyke are shown on the current edition of the OS 1:10560 map (1968).

Information from RCAHMS (SAH), 7 October 1996.

Site Number	12
Site Name	Garafad School,homestead 740m NE of
Type of Site	Dun (Period Unassigned)(Possible)
NRHE Number	NG46NE 17
HER Number	
Status	Scheduled Monument
Easting	149760
Northing	867655

Site Gazeteer

Parish	Kilmuir
Council	Highland
Description	SM3515
	Canmore ID: 11347, coprdinates: 149700, 867700
	NG46NE 17 497 677.
	Scheduled as 'Galleried Dwelling'

Site Number	13
Site Name	Sgeir Bhan, Skye
Type of Site	Cave (Period Unassigned), Craggan(S)
NRHE Number	NG46NE 16
HER Number	MHG6494
Status	Non-designated asset
Easting	149900
Northing	867600
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 11346
	NG46NE 16 centred 499 676
	NG 499 676. A cave or rock shelter near Staffin was found by Mr Dugald Ross (D Ross, 7 Ellishader, Skye). It has the remains of a stone fireplace and inside were found the remains of at least 6 craggans, one complete (see photo on NG46NE 15).
	Information contained in letters from J Close-Brooks (NMAS), 27 March and 1 September 1975.

Site Number	14
Site Name	Garafad,chambered cairn 100m W of Cadha Riach
Type of Site	Chambered Cairn (Neolithic)
NRHE Number	NG46NE 12
HER Number	
Status	Scheduled Monument
Easting	149549
Northing	867567
Parish	Kilmuir
Council	Highland
Description	SM3519
	Canmore ID: 11342, coordinates: 149550, 867570

NG46NE 12 4955 6757.

(NG 494 676) Beaker sherds and plain sherds found with cremated bone at a site, possibly a ring-cairn, at Cadha Riach, were donated to the National Museum of Antiquities of Scotland [NMAS] in 1970 by C C MacLeod, Portree.

NMAS 1971.

The remains of a chambered cairn at NG 4955 6757 surviving as a circular turf-covered mound 0.6m maximum height and spread to a diameter of c.8.5m robbed from the E. Two probable kerbstones in the W and three others in the S, suggest the original diameter was 7.5m. Five stones forming the W arc of the chamber survive in situ, with two others displaced, but the E half has been destroyed as has the entrance passage which was presum- ably in this arc. MacLeod (Mr C MacLeod, Garrafad, Staffin, Isle of Skye) a retired schoolmaster, found the sherds in the S half of the chamber where his care- fully filled in trench is still visible.

To the W of the cairn are a few peat-obscured stony mounds which appear to be stone clearance heaps.

Surveyed at 1/2500. (Enlargement at 1:250)

Visited by OS (I S S) 20 September 1971.

References
NMAS. (1971) Annual report 1970-1. Page(s): 7

Site Number	15
Site Name	Skye, Staffin House
Type of Site	Axehead (Stone)
NRHE Number	NG46NE 14
HER Number	MHG5759
Status	Non-designated asset
Easting	148800
Northing	867400
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 11344

NG46NE 14 c. 488 674.

A stone axe found near Staffin House (NG 488 674) in 1962 by Mr D Lamont, Marischader, Staffin is now in the Skye Folk Museum, Kilmuir, Isle of Skye.

Visited by OS (I S S) 14 September 1971.

Site Number	16
Site Name	Skye, Garafad, Steinscholl Mill
Type of Site	Watermill (Period Unassigned)
NRHE Number	NG46NE 11

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HER Number	MHG5756
Status	Non-designated asset
Easting	148830
Northing	867340
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 11341 NG46NE 11 4883 6734. (NG 4883 6734) Corn Mill (NAT) OS 6" map, Isle of Skye, Inverness-shire, 2nd ed., (1903) Listed under 'Modern Buildings' - Water-mill in the Steinscholl district of Kilmuir. (For description and other mills in the parish see NG47SW 11 and NG37SE 10). NSA 1845. Steinschool water-mill is now disused and ruinous. The machinery has been dismantled and the wheel-pit filled in but sufficient remains to show that it was of the vertical, undershot type. The mill lade is still traceable. Visited by OS (A C) 29 April 1961

Site Number	17
Site Name	Skye, Staffin House, Bridge
Type of Site	Bridge (Period Unassigned)
NRHE Number	NG46NE 38
HER Number	MHG35161
Status	Non-designated asset
Easting	148930
Northing	867450
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 160476 MHG35161 BRIDGE (Post Medieval - 1560 AD to 1900 AD)

Site Number	18
Site Name	Skye, Staffin, Columba 1400 Community And International Leadership Centre
Type of Site	Residential Building (Period Unassigned)
NRHE Number	NG46NE 49

Site Gazeteer

HER Number	
Status	Non-designated asset
Easting	149004
Northing	867461
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 285221 NG46NE 49 49004 67461 Columba 1400 Community Centre [NAT] OS (GIS) Master Map, November 2009. Location formerly entered in error as NG 48924 67369.

Site Number	19
Site Name	Skye, Garafad
Type of Site	Building(S) (Period Unassigned), Township (Period Unassigned)
NRHE Number	NG46NE 28
HER Number	MHG25921
Status	Non-designated asset
Easting	149000
Northing	867500
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 114676 First Edition Survey Project (FESP) A crofting township comprising twenty-two roofed, four partially roofed and eight unroofed buildings, and a further two unroofed buildings which lie to the N of the township, are depicted on the 1st edition of the OS 6-inch map (Inverness-shire, Island of Skye 1879, sheet vii). Thirty-seven roofed buildings, including a school, two partially roofed buildings, nine unroofed buildings, and the two unroofed buildings to the N are shown on the current edition of the OS 1:10560 map (1968). Information from RCAHMS (SAH), 2 October 1996.

Site Number	20
Site Name	Skye, Staffin War Memorial
Type of Site	War Memorial (20th Century)
NRHE Number	NG46NE 53
HER Number	MHG60211

Site Gazeteer

Status	Non-designated asset
Easting	148952
Northing	867407
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 339734

Site Number	21
Site Name	STAFFIN STENSCHOLL PARISH MANSE
Type of Site	Manse (Period Unassigned)
NRHE Number	NG46NE 21
HER Number	MHG16793
Status	Listed Building - Category B
Easting	148873
Northing	867292
Parish	Kilmuir
Council	Highland
Description	LB7250 Canmore ID: 120642 Description Thomas Telford, 1828. Coursed rubble, tooled dressings. 2 storey, 3 bay house with single storey, pienided porches to east and west gables with shaped parapets; window at ground and 1st floor, east gable (1952); some lying pane glazing. Outshot to rear; end stacks; slate roof. Statement of Special Interest Similar to Hallin Manse. References FASTI ECCLESSIAE SCOTICANAE, vii, p. 181, ix, p. 689. Howard Colvin, A BIOGRAPHICAL DICTIONARY OF BRITISH ARCHITECTS, (1978) p. 821. Commissioners for Building Churches in the Highlands and Islands. (1831) Sixth report of the Commissioners for Building Churches in the Highlands and Islands of Scotland. [London]. RCAHMS Shelf Number: F.5.31.COM Hackett and Livingston, S and N. (1984) 'Scottish Parliamentary churches and their manses', in Breeze, D J, Studies in Scottish antiquity presented to Stewart Cruden. Edinburgh. Page(s): 330 RCAHMS Shelf Number: F.2.1.BRE Maclean, A M. (n.d) Parliamentary churches in the Highlands and Islands, Photocopy of TS: diploma thesis. RCAHMS Shelf Number: F.5.31.MAC Miers, M. (2008) The Western Seaboard: an illustrated architectural guide. Edinburgh. RCAHMS Shelf Number: Ref Tanner, G. (1995) Thomas Telford and the Parliamentary Church programme for the Highlands and Islands, Scottish Local History Journal, vol. 34, 1995. Telford, T. (1838b) Atlas to the Life of Thomas Telford, civil engineer. London. RCAHMS Shelf Number: D.6.XL.R

Site Gazeteer

Site Number	22
Site Name	STAFFIN STENSCHOLL PARISH (CHURCH OF SCOTLAND)
Type of Site	Church (19th Century)
NRHE Number	NG46NE 20
HER Number	MHG34158;MHG13900
Status	Listed Building - Category B
Easting	148919
Northing	867314
Parish	Kilmuir
Council	Highland
Description	LB7249

Canmore ID: 120641

Description
Thomas Telford, 1828. Repairs; William Laurie, 1856. Coursed rubble, tooled dressings, all white washed. T-plan church with 4-bay front elevation to north. 2 round headed centre windows, flanking round headed doors; gable and rear windows as front; 2-light Gothic, lattice pane glazing to all windows. Birdcage belfry to west gable apex; stone finial to east gable apex; slate roof.

Interior: original pulpit and sounding board; plain pine pews.

Statement of Special Interest
Ecclesiastical building in use as such. Unusual orientation. Parliamentary Church", similar to Hallin (Duirinish) and Plockton (Lochalsh).

References
FASTI ECCLESSIAE SCOTICANAE, vii, p. 181.
Howard Colvin, A BIOGRAPHICAL DICTIONARY OF BRITISH ARCHITECTS, 1600- 1840 (1978) p. 821.
Colvin, H. (1978) A biographical dictionary of British architects 1600-1840, 3v. London. Page(s): 821 RCAHMS Shelf Number: Quick
Commissioners for Building Churches in the Highlands and Islands. (1831) Sixth report of the Commissioners for Building Churches in the Highlands and Islands of Scotland. [London]. RCAHMS Shelf Number: F.5.31.COM
Hackett and Livingston, S and N. (1984) 'Scottish Parliamentary churches and their manses', in Breeze, D J, Studies in Scottish antiquity presented to Stewart Cruden. Edinburgh. Page(s): 330 RCAHMS Shelf Number: F.2.1.BRE
Hay, G. (1957a) The architecture of Scottish post-Reformation churches, 1560-1843. Oxford. Page(s): 260 RCAHMS Shelf Number: F.5.31.HAY
Maclean, A M. (n.d) Parliamentary churches in the Highlands and Islands, Photocopy of TS: diploma thesis. RCAHMS Shelf Number: F.5.31.MAC
Miers, M. (2008) The Western Seaboard: an illustrated architectural guide. Edinburgh. RCAHMS Shelf Number: Ref
Ritchie and Harman, [J N] G and M. (1996) Argyll and the Western Isles, Exploring Scotland's Heritage series, ed. by Anna Ritchie. 2nd. Edinburgh. Page(s): 106 RCAHMS Shelf Number: A.1.4.HER
Scott, H et al (eds.. (1915-61) Fasti ecclesiae Scoticanae: the succession of ministers in the Church of Scotland from the Reformation, Revision. Edinburgh. Page(s): vol. vii, 181 RCAHMS Shelf Number: C.3.2.FES
Tanner, G. (1995) Thomas Telford and the Parliamentary Church programme for the Highlands and Islands, Scottish Local History Journal, vol. 34, 1995.
Telford, T. (1838b) Atlas to the Life of Thomas Telford, civil engineer. London. RCAHMS Shelf Number: D.6.XL.R

Site Gazeteer

Site Number	23
Site Name	Skye, Staffin, Stenscholl, The Glebe House, Church Manse
Type of Site	Manse (Period Unassigned)
NRHE Number	NG46NE 20.01
HER Number	MHG50296
Status	Non-designated asset
Easting	148963
Northing	867342
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 285868 NG46NE 20.01 48963 67342 The former manse was at NG 48874 67291 (NG46NE 21)

Site Number	24
Site Name	Skye, Kilmartin Church
Type of Site	Church (Period Unassigned)
NRHE Number	NG46NE 40
HER Number	MHG36357
Status	Non-designated asset
Easting	149090
Northing	867230
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 173404 EXTERNAL REFERENCE: Scottish Records Office:- Report on existing Church and proposal to build a new one. Lord Macdonald's commissioners wish James Gillespie, architect, to submit a report and give in plans and estimates for a substantial church. 1807. GD 221/28/39. proposed plan for a new church. Letter from James Gillespie to John Campbell W.S. He is forwarding a plan for the Church of Kilmartin. He suggests that the church need not be regularly seated but have moveable forms. His estimate amounts to #512. 1809. GD 221/49/60. Proposal to build a church.

Application by Mr Martin, Minister of Kilmuir, for a place of worship at Kilmartin and decision by Lord Macdonald's commissioners to order a plan and estimate.
1802. GD 221/15/1.

Site Number	25
Site Name	Skye, Staffin, Free Presbyterian Church
Type of Site	Church (Period Unassigned)
NRHE Number	NG46NE 46
HER Number	
Status	Non-designated asset
Easting	149216
Northing	867068
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 283216

Site Number	26
Site Name	Skye, Longfearn, No. 7
Type of Site	House (Period Unassigned)
NRHE Number	NG56SW 24
HER Number	
Status	Non-designated asset
Easting	151000
Northing	861000
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 99333

Site Number	27
Site Name	Lealt Mill, Skye
Type of Site	Watermill (Period Unassigned)
NRHE Number	NG56SW 10
HER Number	
Status	Non-designated asset
Easting	151300
Northing	860400
Parish	Kilmuir

Site Gazeteer

Council	Highland
Description	Canmore ID: 11529 NG56SW 10 centred 513 604. (NG 513 604) Water Mill at Lealt shown on W Johnson's Map of Skye. Information from W Johnson's Map of Skye, 1824. Not found Visited by OS (A C) 29 April 1961.

Site Number	28
Site Name	Inver Tote, Quarry
Type of Site	Building (Period Unassigned), Quarry (Period Unassigned)
NRHE Number	NG56SW 21.03
HER Number	MHG37198
Status	Non-designated asset
Easting	151800
Northing	860500
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 191631 NG56SW 21.03 518 605 Formerly, prior to the quarry, possibly up to 3 sheds stood on the cliff top part of the works, above the mouth of the Lealt. One of these sheds was subsequently sold to a crofter, and was taken to Balnaknock, Uig. In 1994, the shed was reported as still standing, with later additions. See NG46SW 6. See also NG46SW 10, for photographic records of what may be the diatomite works shed at the nearby settlement of Sheader. Information from handwritten letter from Roger Miket, Museums Officer, Skye and Lochalsh District Council to MKO, MS/1077/27.

Site Number	29
Site Name	Inver Tote, Diatomite Works
Type of Site	Building (Period Unassigned), Chimney Stack (Period Unassigned)
NRHE Number	NG56SW 21.01
HER Number	
Status	Non-designated asset
Easting	152010
Northing	860490
Parish	Kilmuir
Council	Highland

Site Gazeteer

Description	Canmore ID: 191594

Site Number	30
Site Name	Skye, Inver Tote, Diatomite Works
Type of Site	Diatomite Works (19th Century)
NRHE Number	NG56SW 21
HER Number	MHG37187
Status	Non-designated asset
Easting	152022
Northing	860498
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 191593

NG56SW 21.00 5214 6051

See also NG45NE 1 and incorporates information from cancelled site NG56SW 26

NG56SW 21.01 NG 5201 6049 Chimney Stack; Building

NG56SW 21.02 NG 5200 6040 House

NG56SW 21.03 NG 518 605 Quarry

The former diatomite mine and works at Inver Tote sit in the parishes of Kilmuir, to the North and Snizort, to the South. The Lealt River acts as the boundary between the two parishes at this point.

Information from RCAHMS (DHR), July 2001.

See NG45NE 1 for the Diatomite Works at Loch Cuithir.

Information from RCAHMS (DHR), July 2001.

Diatomite is a white or grey mineral earth which has similiarities to china clay. It is formed from deposits of living the skeletons, shields or shells of fresh water minute microscopic organisms or diatoms. Diatomite can be used for insulation against sound and the loss of heat and cold. It is also a useful material for fireproofing.

Information from Diamomite and its Uses, published by the British Diatomite Co. Ltd., Glasgow, see MS/1077/17.

Diatomite is silica-rish sediment formed by microscopic algae, and has many uses, such as face powder, fire-proofing and insulation, neutral filler, and as a filter in several industrial processes. However, one of the greatest causes of interest in Skye Diatomite was its potential use as a substitute for Kieselghur by Alfred Nobel in the production of Dynamite in Nobel's new Scottish factory at Ardeer in Ayrshire during the 1880s.

Nobel eventually found a better source of material, but the Extraction of Diatomite nevertheless began in Skye at Loch Cuithir in 1886. The Diatomite was transported by tramway to be processed at Invertote, production continuing until 1913. The industry was briefly revived between 1950 and 1961, using road transport.

The principal remains of the Invertote works are a large, rubble-built, rectangular-plan roofless building (NG5201 6049). It has been entirely gutted, but fragmentary remains include a large cast-iron flywheel from a steam engine, and a cast-iron wall-mounted bearing box. The other surviving structure is a kiln (NG5201 6052), comprising a lower chanber or firebox built from Scottish firebricks (produced at the Star Works, Glenboig, Lanarkshire, and Etna Works, Armadale, West Lothian), onto which has been constructed a circular-section fireclay-brick column encased by an outer layer of sheet steel. The exact functions of the processing building and the kiln are uncertain, but it is likely that the latter was used for drying purposes.

Information from RCAHMS (MKO) 1994

Site Number	31
Site Name	Inver Tote, Diatomite Works, Manager's House
Type of Site	House (Period Unassigned)
NRHE Number	NG56SW 21.02
HER Number	
Status	Non-designated asset
Easting	152000
Northing	860400
Parish	Snizort
Council	Highland
Description	Canmore ID: 191596

Site Number	32
Site Name	Skye, Inver Tote, Salmon Fishing Station
Type of Site	Fishing Station (Post Medieval)
NRHE Number	NG56SW 27
HER Number	
Status	Non-designated asset
Easting	152010
Northing	860400
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 252695

The remains of a disused salmon fishing station situated on the S bank of the mouth of the River Lealt, near to the ruins of a dam. Surviving component parts included two hand winches, net-drying poles, a rubble-built bothy (asphalt-covered hipped roof mostly collapsed at time of survey) and a store with a corrugated iron roof.

Information from RCAHMS

(MKO) 1994

Site Gazeteer

Site Number	33
Site Name	Lower Tote, Skye
Type of Site	Township (Period Unassigned)
NRHE Number	NG55NW 7
HER Number	
Status	Non-designated asset
Easting	151700
Northing	859900
Parish	Snizort
Council	Highland
Description	Canmore ID: 111904 First Edition Survey Project (FESP) A small township comprising two unroofed buildings, an enclosure and three fields is depicted on the 1st edition of the OS 6-inch map (Inverness-shire, Isle of Skye 1880, sheet xii). Two roofed and seven unroofed buildings, four enclosures and some field walls are shown on the current edition of the OS 1:10000 map (1988). Information from RCAHMS (SAH) 10 October 1996

Site Number	34
Site Name	Skye, Dun Grianan, Tote
Type of Site	Fort (Prehistoric)
NRHE Number	NG55NW 1
HER Number	
Status	Non-designated asset
Easting	152220
Northing	859820
Parish	Snizort
Council	Highland
Description	Canmore ID: 11516 Ordnance Survey Archaeology Division Revision Programme NG55NW 1 5222 5982. (NG 5222 5983) Dun Grianan (NR) OS 1"map, (1947) Dun Creanan (NR) OS 6"map, Inverness-shire, 2nd ed., (1904) Dun Creanan: On a flat-topped hillock at the edge of a cliff 400' high, a stone wall was built on its W or landward side. The wall is very dilapidated and only an occasional facing stone appears

through the grass. The dun measures some 90' N-S by 26', but apparently much of the cliff has been eroded away. The entrance, towards the S, is too dilapidated for measurement.

(RCAHMS 1928).

Dun Grianan: A fort, as described above, except that there is evidence of a further defence to the W consisting of a rough stone wall along the edge of a terrace upon which are two circular stone huts. They measure 5.0m in diameter with walling of rubble, and are set slightly into the slope.

Visited by OS (A S P) 27 April 1961.

The remains of Dun Grianan on a coastal knoll, a position very similar to that occupied by the dun at Tom na h' Uraich (NG47SE 1).

Probably a small fort with the E side fallen away. All that survives is the W wall with the slightly curved outer face visible intermittently for c. 31.0m to a maximum height of three courses, and an occasional stone of the inner face giving a wall thickness of 2.7m near the S end and 3.2m at the entrance towards the centre, which is 1.6m wide and flanked on each side by set stones.

The outwork, about 9.0m outside the fort in the W, is mutilated but shows an intermittent outer wall face to a height of two courses.

There is not enough evidence to classify with certainty the sub-circular platforms noted by previous OS surveyor as hut circles. They may be natural or due to quarrying.

Visited by OS (A A) 4 November 1971.

Field Visit (31 August 1915)

RCAHMS Inventory: Outer Hebrides, Skye and the Small Isles.

Dun Creanan, Inver Tote.

About 700 yards south of Inver Tote, which lies at the mouth of the Lealt River, on the edge of the cliff on the sea-shore, some 400 feet high, is a prominent, flat-topped hillock rising some 30 feet above the hollow which intervenes between it and the higher ground to the east. The summit is occupied by Dun Creanan, which has been defended by a stone wall built along its western or landward edge. The wall is much dilapidated, and only an occasional stone on its outer face appears through the grass with which it is overgrown. The dun measures some 90feet in length from north to south and only some26 feet at most from the exterior of the wall on the west flank to the edge of the cliff on the east. Apparently a considerable part of the cliff has fallen since the dun was built. The entrance, which is placed towards the southern end of the landward side, is too dilapidated for measurement.

RCAHMS 1928, visited 31 August 1915.

OS map: Skye xii.

Note (20 January 2015 - 30 May 2016)

Atlas of Hillforts of Britain and Ireland

This small promontory work is situated on the coastal escarpment below Lower Tote. The promontory rises into a low hillock which falls away some 60m to the sea on the E and is separated from the higher ground to the W by a saddle. Access from the W is barred by two walls set about 9m apart, the inner of which is drawn in a shallow arc 31m in length and varies in thickness from 2.7m near its S end to 3.2m adjacent to an entrance 1.6m wide midway along its length on the W. Though only occasional inner facing-stones are visible, the line of the outer

face can be traced intermittently, in places still standing three course high; there are also intermittent traces of up to two courses of the outer face along the outer wall. What remains of the featureless interior measures about 27m from N to S but has been reduced by erosion along the cliff-edge to no more than 8m transversely (0.03). The hut-circle to the rear of the outer rampart noted by an OS surveyor in 1961 were dismissed as either natural or shallow quarries by Alan Ayre of the OS in 1971.

Information from An Atlas of Hillforts of Great Britain and Ireland – 30 May 2016. Atlas of Hillforts SC2720

References
RCAHMS. (1928) The Royal Commission on the Ancient and Historical Monuments and Constructions of Scotland. Ninth report with inventory of monuments and constructions in the Outer Hebrides, Skye and the Small Isles. Edinburgh. Page(s): 202, No. 629 RCAHMS Shelf Number: A.1.1.INV(9)

Site Number	35
Site Name	Diatomite tramway - Loch Cuithir, Lealt
Type of Site	TRAMWAY (19th Century to 20th Century - 1850 AD? to 1961 AD?)
NRHE Number	
HER Number	MHG44711
Status	Non-designated asset
Easting	151945
Northing	860430
Parish	Kilmuir
Council	Highland
Description	The line of a former tramway running from a former late C19 diatomite works (see MHG5104) at Loch Cuithir to east of Lealt, Skye. Diatomite Works (NAT) Tramway (NAT) OS 6"map, Inverness-shire, 2nd ed., (1952) At the beginning of the 20th century Loch Cuithir was worked for diatomite which was carried by tramline to the shore near Inver Tote where it was dried and ground in a small factory. Although the industry was allowed to die, and the works became derelict, it has now been re-established. A lower date-bar for the age of this industry is provided by the 1st ed. 6" map (1875/80) which shows nothing here at that time. <1> At the time of investigation, the works were being demolished, and no further work is to be carried out. The tramway has been long dismantled. Visited by OS (A S P) 29 April 1961. Part way along the line of the tramway as it moves north, there is a dogleg visible on vertical APs but not shown on any historic OS maps that leaves the main line at NGR 148967 859848. This curves around to the southeast for c.187m and terminates at the remains of what appears to be a small square-ish building [IS-L 27/08/2020]. GIS spatial data created in 2020 according to line of feature as seen on 2009 vertical APs.

Site Number	36
Site Name	Enclosure - Lower Tote, Skye

Site Gazeteer

Type of Site	ENCLOSURE (17th Century to 19th Century - 1700 AD? to 1850 AD?)
NRHE Number	
HER Number	MHG62030
Status	Non-designated asset
Easting	152161
Northing	860252
Parish	Snizort
Council	Highland
Description	An enclosure at Lower Tote, Skye. An enclosure at Lower Tote, Skye, is visible on 1999-2001 and 2009 vertical APs. <1> <2>

Site Number	37
Site Name	Township - Lealt
Type of Site	ownship (Undated); Head Dyke (Undated)
NRHE Number	MHG5261
HER Number	
Status	Non-designated asset
Easting	151182
Northing	860573
Parish	Kilmuir
Council	Highland
Description	Centred on 506 606. NG 506 606. Lealt: depopulated township consists of about 14 ruined houses, with garths, and some small enclosures. Partly re-occupied. Visited by OS (A S P) 27 April 1961. A crofting township comprising seventeen roofed buildings, four of which are long buildings, two unroofed buildings, one of which is a long building, their associated enclosures and field walls and two phases of head-dyke is depicted on the 1st edition of the OS 6-inch map (Inverness-shire, Isle of Skye 1880, sheet xii). Ten roofed and fourteen unroofed buildings, their associated enclosures and field walls and two phases of head-dyke are shown on the current edition of the OS 1:10000 map (1993). Information from RCAHMS (SAH) 10 October 1996

Site Number	38
Site Name	Settlement - 'Mill', Lealt
Type of Site	(Former Type) WATERMILL? (Undated); SETTLEMENT (17th Century to 18th Century - 1700 AD?
NRHE Number	
HER Number	MHG5262
Status	Non-designated asset
Easting	151088

Northing	860586
Parish	Kilmuir
Council	Highland
Description	NG56SW 10 centred 513 604. (NG 513 604) Water Mill at Lealt shown on W Johnson's Map of Skye. Information from W Johnson's Map of Skye, 1824. Not found Visited by OS (A C) 29 April 1961. W Johnson's map of Skye does not show watermills at any other locations. The label 'Mill' is beside a single small black rectangle which is Johnson's symbol for a settlement. It therefore follows that 'Mill' was the name of a settlement subsequently absorbed into Lealt, which is shown slightly further west along the river [IS-L 26/08/2020].

Site Number	39
Site Name	Enclosures - S of Lealt, Skye
Type of Site	ENCLOSURE (18th Century to 19th Century - 1750 AD? to 1850 AD?)
NRHE Number	
HER Number	MHG61969
Status	Non-designated asset
Easting	150797
Northing	860560
Parish	Kilmuir
Council	Highland
Description	Two possibly conjoined enclosures south of Lealt, Skye. Two possibly conjoined enclosures south of Lealt and adjacent to the Abhainn An Lethuillt, Skye, on 1999-2001 and 2009 vertical APs. The northern of the two appears to be roughly square and measures c.10m x 10m. The southern enclosure is slightly larger at 14m x 12. They are both within another larger dyked enclosure and there is rig and furrow to the northeast. <1> <2>

Site Number	40
Site Name	Farm buildings? - S of Lealt, Skye
Type of Site	BUILDING (18th Century to 19th Century - 1750 AD? to 1850 AD?)
NRHE Number	
HER Number	MHG61968
Status	Non-designated asset
Easting	150793
Northing	860605
Parish	Kilmuir
Council	Highland

Description	Possible farm buildings south of Lealt, Skye. At least one building is visible south of Lealt and adjacent to the Abhainn An Lethuillt, Skye, on 1999-2001 and 2009 vertical APs. A possible second building immediately to the northeast may be nothing more than a field dyke and coincidental vegetation. <1>

Site Number	41
Site Name	Field barn? - SE of Lower Tote, Skye
Type of Site	FIELD BARN (18th Century to 19th Century - 1750 AD? to 1850 AD?)
NRHE Number	
HER Number	MHG62031
Status	Non-designated asset
Easting	151780
Northing	859692
Parish	Snizort
Council	Highland
Description	A probable field barn to the southeast of Lower Tote, Skye. A probable field barn to the southeast of Lower Tote, Skye, is visible on 1999-2001 and 2009 vertical APs. <1> <2>

Site Number	42
Site Name	Enclosure - Lower Tote, Skye
Type of Site	ENCLOSURE (17th Century to 19th Century - 1700 AD? to 1850 AD?);HUT CIRCLE? (Neolithic to
NRHE Number	
HER Number	MHG62032
Status	Non-designated asset
Easting	152117
Northing	859643
Parish	Snizort
Council	Highland
Description	An enclosure at Lower Tote, Skye. An enclosure at Lower Tote, Skye, is visible on 1999-2001 and 2009 vertical APs. It is almost circular and measures c.14.5m in diameter. At its southern end it has a straight side formed from a wider earthwork. However, on the 1999-2001 aerial photos there are slight indications that it may once have been completely circular and that the straight southern side is a later addition. It is possibly a large hut circle or sheep fold. There are also slight indications of a second, smaller more oval enclosure abutting to its southeast quadrant. <1> <2>

Site Number	43
Site Name	Farmstead - Lonfearn, Skye

Site Gazeteer

Type of Site	FARMSTEAD (17th Century to 19th Century - 1700 AD? to 1850 AD?)
NRHE Number	
HER Number	MHG62033
Status	Non-designated asset
Easting	151847
Northing	861557
Parish	Kilmuir
Council	Highland
Description	An abandoned farmstead at Lonfearn, Skye. An abandoned farmstead at Lonfearn, Skye, is visible on 1999-2001 and 2009 vertical APs. There are at least 3 buildings and a small enclosure. <1> <2>

Site Number	44
Site Name	Carn Ban,cairn 350m E of Staffin Lodge,Kilmuir
Type of Site	Skye, Staffin, Carn Ban
NRHE Number	NG46NE 2
HER Number	MHG6498
Status	Scheduled Monument
Easting	148742
Northing	868254
Parish	Kilmuir
Council	Highland
Description	SM3517 Canmore ID: 11350 Ordnance Survey Archaeology Division Revision Programme NG46NE 2 487 682 (NG 487 682) Carn Ban (NR) OS 1" map, (7th series) Carn Ban, the remains of a large circular cairn measuring 52ft in diameter. Almost levelled to the ground, the circumference is outlined by a kerb or large stones set on edge. (RCAHMS 1928). Carn Ban as described by RCAHMS. The kerb can be traced from the NW side through E to the S side, and a single stone remains on the SW side. On the WNW of the cairn two large stones at right angles to the peristalith (? portal stones), suggest the cairn may originally have been chambered. It is in poor condition, nowhere more than 1.0m in height and is surrounded by a number of ruined houses.

Visited by OS (A S P) 25 April 1961.

Field Visit (27 May 1914)
RCAHMS Inventory: Outer Hebrides, Skye and the Small Isles.

Cairn, Carn Ban, Garrafad.

At an elevation of barely 100 feet above sea-level, some 400 yards east of Staffin Lodge and 200 yards from the southern shore of Staffin Bay, are the remains of Carn Ban, a large circular cairn measuring 52 feet in diameter. The cairn is almost levelled to the ground, the circumference being outlined by a ring of large stones set on edge.

RCAHMS 1928, visited 27 May 1914.

OS map: Skye vii (unnoted).

Field Visit (15 April 1988)
Not a chambered cairn, but remains of a dun (or possibly a broch), mutilated and robbed for later settlement. The outer and inner faces of a wall varying between 3 - 3.5m in thickness, with an internal diameter of between 10 - 11m. The entrance passage (0.7m in width) lies at the NW.

A circular structure some 2m in diameter and with a wall thickness of 0.8m sits in the northern quadrant of the interior, and is probably of a later date. Similarly hollows within the interior seem to be of a later date to the defensive works. Later rectangular buildings to the E, W and N and stone dykes, have probably absorbed some of the original fabric.

Visited by R Miket, 15 April 1988.

References
RCAHMS. (1928) The Royal Commission on the Ancient and Historical Monuments and Constructions of Scotland. Ninth report with inventory of monuments and constructions in the Outer Hebrides, Skye and the Small Isles. Edinburgh. Page(s): 175, No. 552 RCAHMS Shelf Number: A.1.1.INV(9)

Site Number	45
Site Name	Staffin House, shell midden 1050m NNE of
Type of Site	SHELL MIDDEN (Mesolithic - 8000 BC to 4001 BC);ROCK SHELTER (Mesolithic to Early Iron Age -
NRHE Number	
HER Number	MHG6497
Status	Scheduled Monument
Easting	149115
Northing	868493
Parish	Kilmuir
Council	Highland
Description	SM7848

Description
The monument is a Mesolithic-period and later occupation site located in a rock face close to the coast.

Part of the site has been excavated but the rest remains in situ. The cultural deposits which were excavated included a Mesolithic shell midden dating to around 7500 years ago. This

contained cultural material, including bone and stone tools and the remains of animals. Upper layers produced an Iron Age object and evidence of nineteenth-century occupation.

NG46NE 19 490 685

Immediately S of An Corran and on a ledge to the west of the road leading to Staffin slipway is a shell-midden (Patella Vulgata and Littorina Litorea) together with burnt bone. A flint point and a chert flake were picked from the surface.
Visited by R Miket 12 May 1988. <1>

NG 491 684 Salvage investigation took place during December 1993/January 1994 of a ledge at the base of E-facing cliffs in advance of rock-blasting for road works. Disturbed upper levels contained the remains of numerous hearths and fires but the only datable finds were a mid 19th-century glass bottle and a bronze pin of Early Iron Age type.
An underlying shell midden contained a very important Mesolithic assemblage of bone and lithic tools, as well as abundant faunal remains. A radiocarbon determination of 7590 +/- 90 BP (OxA-4994) has been obtained on one of the bevel-ended tools, made on a red deer bone. The lithic industry, using locally available silicious and basaltic materials, included the manufacture of microliths by microburin technique.
About one-fifth of the rock-shelter deposits were examined, but the ledge itself has been preserved despite removal of the cliff.
Sponsors: Skye & Lochalsh District Council Museums Service, Highland Region Roads Department, NMS. <2>

See link below to published 2012 report for detailed result of 1993-4 excavations and subsequent post-excavation work. The rock shelter was found to have contained a series of shell midden and other deposits with evidence for human occupation from Mesolithic and later periods. A total of 41 separate contexts were identified. Of these, 31 were recent or later prehistoric, the upper levels containing a series of hearths of recent date and an Iron Age copper-alloy pin. The lowest 10 layers were identified initially as Mesolithic on the basis of bone tool and lithic typology, but a series of 18 radiocarbon dates indicates they contain the residues of subsequent prehistoric activity as well. These layers consisted of several distinct areas ofmidden, below which there were two, possibly three, horizons which probably, based on the presence of broad blade microliths, represent Early Mesolithic activity. The midden layers also contained some human bones radiocarbon-dated to the Neolithic period. The rockshelter was located below an outcrop of baked mudstone and near a source of chalcedonic silica. Both these lithic raw materials were widely used during the Mesolithic as far away as the island of Rùm. <3>

See published 2012 report for a list of the 18 radiocarbon dates obtained from the site. Six dates were taken from bevel-ended tools, one from a bone point, five from human bones, two from pig, three from aurochs and one from an unspecified ruminant. The radiocarbon analyses make it clear that intermittent activity took place on the rockshelter throughout prehistory, from the Mesolithic the Iron Age.
Stable Isotope analysis was also undertaken on the human bone, the result of which can be viewed in the report. <3>

Human remains from the site are within NMS collections. <4>

Sources/Archives (4)

<1> Text/Publication/Article: Wildgoose, M. 1988. An Choran (Kilmuir parish), shell midden, flints. SHG23032. 17. Paper (Original). 17.
<2> Text/Publication/Article: Saville, A & Miket, R. 1994. 'An Corran, Staffin, Skye (Kilmuir parish): rock-shelter' in Discovery and Excavation in Scotland 1994. SHG23037. 40-1. Paper (Original). 40-1, fig 19.
<3> Text/Report: Saville, A., Hardy, K., Miket, R., Ballin, T B. 2012. An Corran, Staffin, Skye: A Rockshelter with Mesolithic and Later Occupation. Scottish Archaeological Internet Report Vol. 51. Digital.
<4> Dataset/Database File: 2020. Database of Human Remains in Museum Collections from Highland Area. NMS, IMAG & Marishal College. Digital.

The area to be scheduled measures 60m NW-SE by 30m SW-NE, to include the surviving part of the shell midden and an area around it in which traces of activities associated with the use of the site may survive, as shown in red on the accompanying map extract.

Site Number	46
Site Name	Garafad School, Skye
Type of Site	Dun (Period Unassigned)(Possible)
NRHE Number	NG46NE 17
HER Number	MHG6495
Status	Non-designated asset
Easting	149699
Northing	867701
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 11347 NG46NE 17 497 677. Scheduled as 'Galleried Dwelling' MHG6495 Possible Dun, Garafad School DUN (Iron Age - 550 BC to 560 AD)

Site Number	47
Site Name	Tom Telford: Staffin Bay, Trotternish, Skye, North Minch
Type of Site	Lighter (20th Century)
NRHE Number	NG46NE 8002
HER Number	
Status	Non-designated marine asset
Easting	147600
Northing	868700
Parish	Maritime - Highland
Council	Highland
Description	Canmore ID: 295379 NG46NE 8002 c. 48 69 N57 38 W6 13 NLO: Staffin Bay [name centred NG 481 691]

Digg [name centred NG 468 697]

Skye [name centred NG 45 35].

(Classified as lighter, with cargo of bricks: date of loss cited as 19 September 1919). Tom Telford: this vessel sank and was wrecked in Digg Bay, Staffin, Skye.

Registration: British. Built 1844. 28nrt.

(Location of loss cited as N57 39.0 W6 14.0).

I G Whittaker 1998.

The location assigned to this record is essentially tentative. Digg Bay is not noted as such on the 1998 edition of the OS 1:50,000 map, but the name presumably applies to Staffin Bay, a significant indentation into the East coast of the Trotternish peninsula. Digg itself lies inland, to the W of the bay.

Although recorded under the classification of lighter, the cargo and location of loss are consistent with the classification of this vessel as a steam lighter or puffer.

Information from RCAHMS (RJCM), 23 July 2008.

Reference (2011)

Project Adair - Whittaker data upload.

Whittaker ID : 13006
Name : TOM TELFORD
Latitude : 573900
Longitude : 61400
Date Built : 1844
Registration : BRITISH
Type : LIGHTER
Tonnage : 28
Tonnage Code : N
Loss Day : 19
Loss Month : 9
Loss Year : 1919
Comment : Sank and wrecked in Digg Bay, Staffin, Skye.
Cargo : BRICKS

Photographic Survey (2015)

Photos of an intertidal wreck were provided to the SAMPHIRE team by David Oakes, a sustainable scallop farmer based in Sconser, Skye. The team had visited David and his family at their home during the 2014 community engagement fieldwork and had been provided with information on several other maritime archaeological sites. In early 2015 David provided two photographs of this wreck site on the beach in Staffin Bay, Skye. The images show four or five distinct large metal objects near the low water mark. They are not all easily identifiable but one is clearly a steam boiler. It is likely that these objects are not usually visible as no other references to them could be traced.

David stated his belief that this wreck was that of the Tom Telford. The National Inventory includes an entry for a recorded loss of this name. The entry is for an unlocated wreck derived from Whitaker's Off Scotland database. The Tom Telford was a steam lighter or puffer built in 1844 and lost on the 19th of September 1919 with a cargo of bricks in Digg Bay, an alternative name for Staffin Bay. The identification seems likely to be correct based on the location and nature of the remains.

No exact coordinates for the wreck were available but the site falls within the intertidal zone

near the low water mark and the photographs provided suggest it is near the north or centre of the main beach.

Coordinates: 147600,868700

Accuracy: 20m

References
Whittaker, I G. (1998) Off Scotland: a comprehensive record of maritime and aviation losses in Scottish waters. Edinburgh. Page(s): 274 RCAHMS Shelf Number: E.5.14.WHI

Site Number	48
Site Name	Sampson: Staffin Bay, Trotternish, Skye, North Minch
Type of Site	Sloop (19th Century)
NRHE Number	NG46NE 8001
HER Number	MHG50194
Status	Non-designated marine asset
Easting	148000
Northing	869000
Parish	Maritime - Highland
Council	Highland
Description	Canmore ID: 285475

NG46NE 8001 c. 48 69

N57 38 W6 13

NLO: Staffin Bay [name centred NG 481 691]

Skye [name centred NG 45 35].

Corry, by Broadford, 8th Oct. The SAMPSON (sloop), of Glasgow, with stones and timber, has been put ashore in Loch Staffin [Staffin Bay], on the East coast, and has become a total wreck: part of the timber has been landed in a damaged state.

Source: LL, No. 16,691, London, Friday, October 11 1867.

Glasgow, 15th Oct. The SAMPSON (sloop), which was wrecked in Loch Staffin [Staffin Bay], Skye, 3rd Oct., belonged to Inverness, not to this place, as before reported, and was bound hence to Stenscholl.

Source: LL, No. 16,696, London, Thursday, October 17 1867.

NMRS, MS/829/72 (no. 11294).

(Classified as sloop, with cargo of stones and timber: date of loss cited as 3 October 1867). Sampson: this vessel was wrecked in Loch Staffin [Staffin Bay], E side of Skye. Capt. McArthur. (On Staffa?).

Registration: Inverness. Built 1834. 53 tons burthern. Length: 16m. Beam: 4m.

(Location of loss cited as N57 38.5 W6 14.0).

I G Whittaker 1998.

The location assigned to this record is essentially tentative. Staffin Bay forms a significant indentation into the East coast of the Trotternish peninsula.

The suggestion by Whittaker that this vessel was lost on Staffa may be discounted.

Information from RCAHMS (RJCM), 28 December 2006.

Reference (2011)

Project Adair - Whittaker data upload.

Whittaker ID : 11810
Name : SAMPSON
Latitude : 573830
Longitude : 61400
Date Built : 1834
Registration : INVERNESS
Type : SLOOP
Tonnage : 53
Tonnage Code : B
Length : 16
Beam : 4
Loss Day : 3
Loss Month : 10
Loss Year : 1867
Comment : Wrecked in Loch Staffin, east side of Skye. Capt. McArthur (On Staffa?)
Cargo : STONES, TIMBER

References
Whittaker, I G. (1998) Off Scotland: a comprehensive record of maritime and aviation losses in Scottish waters. Edinburgh. Page(s): 274 RCAHMS Shelf Number: E.5.14.WH

Site Number	49
Site Name	Pride Of Moray: Staffin Bay, Trotternish, Skye, North Minch
Type of Site	Steam Drifter (20th Century)
NRHE Number	NG46NE 8004
HER Number	
Status	Non-designated marine asset
Easting	148000
Northing	869000
Parish	Maritime - Highland
Council	Highland
Description	Canmore ID: 295392

NG46NE 8004 c. 48 69

N57 38 W6 13

NLO: Staffin Bay [name centred NG 481 691]

Skye [name centred NG 45 35].

(Classified as steam drifter: date of loss cited as 29 July 1927). Pride of Moray: this vessel stranded in Staffin Bay.

ON: 127,518, Built 1909. 50grt.

(Location of loss cited as N57 38.50 W6 14.0).

I G Whittaker 1998.

The location assigned to this record is essentially tentative. Staffin Bay forms a significant indentation into the East coast of the Trotternish peninsula.

Information from RCAHMS (RJCM), 23 July 2008.

Reference (2011)

Project Adair - Whittaker data upload.

Whittaker ID : 13068

Name : PRIDE OF MORAY
Latitude : 573830
Longitude : 61400
Date Built : 1909
Type : STEAM DRIFTER
Tonnage : 50
Tonnage Code : G
Loss Day : 29
Loss Month : 7
Loss Year : 1927
Comment : Stranded at Staffin Bay. ON:127,518

References
Whittaker, I G. (1998) Off Scotland: a comprehensive record of maritime and aviation losses in Scottish waters. Edinburgh. Page(s): 274 RCAHMS Shelf Number: E.5.14.WHI

Site Number	50
Site Name	Fionella: Staffin Island, Trotternish, Skye, North Minch
Type of Site	Motor Fishing Vessel (20th Century)
NRHE Number	NG46NE 8003
HER Number	
Status	Non-designated marine asset
Easting	149200
Northing	869300
Parish	Maritime - Highland
Council	Highland
Description	Canmore ID: 295391
	NG46NE 8003 c. 492 693
	N57 38.6 W6 12.2

NLO: Staffin Bay [name centred NG 481 691]

Staffin Island [name: NG 492 693]

Skye [name centred NG 45 35].

(Classified as M[otor] F[ishing] V[essel]: registration cited as PD 261, and date of loss as 11 October 1985). Fionella: this vessel stranded on Staffin [Island], Skye. All gone?

Registration: Peterhead. Length: 20m.

(Location of loss cited as N57 38.67 W6 12.0).

I G Whittaker 1998.

The location assigned to this record is essentially tentative. It remains uncertain whether the vessel stranded on the W (Staffin Bay) or E (North Minch) side of the island.

Information from RCAHMS (RJCM), 23 July 2008.

Reference (2011)

Project Adair - Whittaker data upload.

Whittaker ID : 15929

Name : FIONELLA (PD 261)
Latitude : 573840
Longitude : 61200
Registration : PETERHEAD
Type : MFV
Length : 20
Loss Day : 11
Loss Month : 10
Loss Year : 1985
Comment : Stranded on Staffin, Skye. AG?

References
Whittaker, I G. (1998) Off Scotland: a comprehensive record of maritime and aviation losses in Scottish waters. Edinburgh. Page(s): 274 RCAHMS Shelf Number: E.5.14.WHI

Site Number	51
Site Name	Peggy And Ellen: Skye, Little Minch
Type of Site	Craft (19th Century)
NRHE Number	NG47SE 8004
HER Number	
Status	Non-designated marine asset
Easting	146000
Northing	872000
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 213718

NG47SE 8004 unlocated

NLO: Skye [name centred NG 45 35].

Stornaway [Stornoway], 23d Oct. 'The PEGGY & ELLEN, Penny, from Drontheim to Belfast, was totally wrecked off the north end of Skye 12th inst. Part of the cargo, and some of the materials saved.'

Source: The Marine List, LL, No. 5956, London, Tuesday November 2 1824.

NMRS, MS/829/71 (no. 6376).

(No classification or cargo specified: date of loss cited as 12 October 1824). Peggy & Ellen: this vessel was wrecked off the N end of Skye. Capt. Penny.

(Location of loss cited as N57 40.0 W6 15.0).

I G Whittaker 1998.

The map sheet assigned to this record is essentially arbitrary. Rubha Hunish, the most northerly point on Skye, is at NG 407 770.

Information from RCAHMS (RJCM), 17 April 2002.

Reference (2011)

Project Adair - Whittaker data upload.

Whittaker ID : 13043

Name : PEGGY & ELLEN
Latitude : 574000
Longitude : 61500
Loss Day : 12
Loss Month : 10
Loss Year : 1824
Comment : Wrecked off the north end of Skye. Capt. Penny

References
Larn and Larn, R and B. (1998) Shipwreck index of the British Isles: volume 4, Scotland. London. Page(s): DG 12/11/1824 RCAHMS Shelf Number: E.5.14.LAR
Whittaker, I G. (1998) Off Scotland: a comprehensive record of maritime and aviation losses in Scottish waters. Edinburgh. Page(s): 274 RCAHMS Shelf Number: E.5.14.WHI

Site Number	52
Site Name	Olive Branch: Skye, Little Minch
Type of Site	Craft (19th Century)
NRHE Number	NG47SE 8003
HER Number	
Status	Non-designated marine asset
Easting	146000

Site Gazeteer

Northing	872000
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 286513

Archaeology Notes

NG47SE 8003 unlocated

NLO: Skye [name centred NG 45 35].

See also NS07SW 8005.

Greenock, 17th Mar. The OLIVE BRANCH, of Sunderland, Lumsden, from Liverpool to Newcastle, with salt, was driven on the rocks off the NE end of Skye 9th Mar., and sunk in half an hour: crew saved in their own boat, and arrived here. A large ship was seen on shore at Kintorley, Island of Bute, by the Liverpool steamer arrived here yesterday morning.

Source: LL, No. 15,581, London, Friday, March 18 1864.

NMRS, MS/829/72 (no. 10603).

(No classification specified: cargo cited as salt, and date of loss as 9 March 1864). Olive Branch: this vessel stranded on rocks at the N end of Skye, slipped off and sank. Capt. Lumsden.

Registration: Sunderland.

(Location of loss cited as N57 40.0 W6 15.0).

I G Whittaker 1998.

The map sheet assigned to this record is essentially arbitrary. Rubha Hunish, the most northerly point on Skye, is at NG 407 770.

Information from RCAHMS (RJCM), 19 February 2007.

Reference (2011)

Project Adair - Whittaker data upload.

Whittaker ID : 11454

Name : OLIVE BRANCH
Latitude : 574000
Longitude : 61500
Registration : SUNDERLAND
Loss Day : 9
Loss Month : 3
Loss Year : 1864
Comment : Stranded on rocks at the north end of Skye, slipped off and sank. Capt.Lumsden
Cargo : SALT

References
Whittaker, I G. (1998) Off Scotland: a comprehensive record of maritime and aviation losses in Scottish waters. Edinburgh. Page(s): 274 RCAHMS Shelf Number: E.5.14.WHI

Site Gazeteer

Site Number	53
Site Name	Fanny Peat: Little Minch
Type of Site	Schooner (19th Century)
NRHE Number	NG47SE 8002
HER Number	
Status	Non-designated marine asset
Easting	146000
Northing	872000
Parish	Kilmuir
Council	Highland
Description	Canmore ID: 295370

NG47SE 8002 unlocated

NLO: Skye [name centred NG 45 35].

(Classified as schooner: no cargo specified: date of loss cited as 16 November 1844). Fanny Peat: this vessel was wrecked on the N coast of Skye. Capt. Welsh.

Registration: Maryport. Built 1840. 76 tons burthern. Length: 17m. Beam: 5m.

(Location of loss cited as N57 40.0 W6 15.0).

I G Whittaker 1998.

The map sheet assigned to this record is essentially tentative, being derived from the unverified location of loss that is cited by Whittaker.

Information from RCAHMS (RJCM), 23 July 2008.

Reference (2011)

Project Adair - Whittaker data upload.

Whittaker ID : 14319

Name : FANNY PEAT
Latitude : 574000
Longitude : 61500
Date Built : 1840
Registration : MARYPORT
Type : SCHOONER
Tonnage : 76
Tonnage Code : B
Length : 17
Beam : 5
Loss Day : 16
Loss Month : 11
Loss Year : 1844
Comment : Wrecked on the north coast of Skye. Capt. Welsh

References
Whittaker, I G. (1998) Off Scotland: a comprehensive record of maritime and aviation losses in Scottish waters. Edinburgh. Page(s): 274 RCAHMS Shelf Number: E.5.14.WHI

Site Gazeteer

Site Number	54
Site Name	Feasibility Study - Staffin Community Trust New Pathways, Staffin, Isle of Skye
Type of Site	Archaeological Desk Based Assessment
NRHE Number	
HER Number	EHG4492
Status	Event
Easting	148692
Northing	868172
Parish	KILMUIR
Council	Highland
Description	Technique(s) DESK BASED ASSESSMENT, WALKOVER SURVEY Organisation Ross & Cromarty Archaeological Services (RoCAS) Date Aug-Sept 2014 Description An archaeological desk-based assessment, walkover survey and feasibility study was carried out between 12 August 2014 and 15 September 2014 on behalf of Staffin Community Trust as part of plans to construct a new network of paths along the east coast of the Trotternish peninsula, Isle of Skye, to complement and augment the existing pathways. Eight routes were surveyed over the course of three days with 165 sites recorded. The work was undertaken to assess the nature and extent of any archaeological sites along the proposed routes in order to provide information on their potential as points of interest to those using the paths; to inform recommendations for further research and interpretation of the sites and to inform recommendations for the protection and management of the sites. <1> Sources/Archives (1) <1> Text/Report/Fieldwork Report: Lynn Fraser & Mary Peteranna. 2014. Feasibility Study - Staffin Community Trust New Pathways, Staffin, Isle of Skye. Ross & Cromarty Archaeological Services. Digital.

Site Number	55
Site Name	Feasibility Study - Staffin Community Trust New Pathways, Staffin, Isle of Skye
Type of Site	Archaeological Desk Based Assessment
NRHE Number	
HER Number	EHG4492
Status	Event
Easting	151656
Northing	861454
Parish	Snizort

Council	Highland
Description	Technique(s) DESK BASED ASSESSMENT, WALKOVER SURVEY Organisation Ross & Cromarty Archaeological Services (RoCAS) Date Aug-Sept 2014 Description An archaeological desk-based assessment, walkover survey and feasibility study was carried out between 12 August 2014 and 15 September 2014 on behalf of Staffin Community Trust as part of plans to construct a new network of paths along the east coast of the Trotternish peninsula, Isle of Skye, to complement and augment the existing pathways. Eight routes were surveyed over the course of three days with 165 sites recorded. The work was undertaken to assess the nature and extent of any archaeological sites along the proposed routes in order to provide information on their potential as points of interest to those using the paths; to inform recommendations for further research and interpretation of the sites and to inform recommendations for the protection and management of the sites. <1> Sources/Archives (1) <1> Text/Report/Fieldwork Report: Lynn Fraser & Mary Peteranna. 2014. Feasibility Study - Staffin Community Trust New Pathways, Staffin, Isle of Skye. Ross & Cromarty Archaeological Services. Digital.

Site Number	56
Site Name	An Corran Geological Conservation Revew Site
Type of Site	Dinosaur Footprints
NRHE Number	
HER Number	
Status	Geological Conservation Revew Site
Easting	149241
Northing	868439
Parish	Kilmuir
Council	Highland
Description	Found at Rubha nam Braithrean (or Brother's Point, as it has been anglicised), the majority of the footprints appear to have been made by four-legged sauropods. These were the largest terrestrial creatures living at this time, which could stand as tall as 60ft, stretch as long as 130ft, and possibly weigh up to ten times the record weight of a modern elephant! The sauropods that left their marks on Skye weren't quite this impressive though: considerably smaller, the dinosaurs that roamed our Misty Isle perhaps only stood around 6 or 7ft tall. Nevertheless, the news of this discovery is still thrilling for palaeontologists and dinosaur enthusiasts alike. Even more importantly, a different series of tracks consisting of three-clawed prints have been attributed to theropods (meaning "beast-footed"), which are fast-moving, bipedal carnivores. The footprints found here belong to smaller dinosaurs, which are the "older cousins" of the Tyrannosaurus Rex! The Middle Jurassic Period saw dinosaurs evolve from creatures the size of house cats to the great monsters that Hollywood now brings to life. The evidence of dinosaurs from this time,

about which little is known, is extremely limited across the world, making this recent discovery all the more exciting!

The History
Around 170 million years ago, shortly after the breaking up of Pangea, the supercontinent, Skye wasn't the 'Misty Isle' it is today, but rather a part of a smaller subtropical island much nearer the equator. Since then, many countries suffered a subcontinental drift, meaning that the landmasses separated from each other to form their own islands. Once upon a time where there was once a lagoon, there is now a Loch or coastal perimeter. Where a mountain now stands, there may have once been a seabed. This has led to fossil discoveries in a range of locations, even the most unexpected places.

Internationally-recognised Jurassic sites on Skye, containing rare evidence of how dinosaurs and early mammals lived many millions of years ago, have been granted greater vital legal status, to help ensure their protection for future generations.

Minister for Rural Affairs and the Natural Environment, Mairi Gougeon, today signed a Nature Conservation Order (NCO) at Staffin Museum, home of dinosaur bones and footprints found nearby.

The key aim of the NCO is to prevent rare vertebrate fossils from being damaged through irresponsible collection and removal from Skye's globally important fossil sites. Importantly, the NCO aims to encourage local people and the wider public to take an interest in and report any potentially important fossil finds.

In the past, important fossil discoveries have been damaged by hammering, with specimens taken from the island and moved to private collections. In 2016 an attempt to take a plaster cast of a dinosaur footprint at An Corran risked significant damage to a feature that has become an important tourist attraction.

Known as the Dinosaur capital of Scotland, the rich Middle Jurassic fossil fauna of Skye is gradually being revealed with new discoveries continuing to be made. These include some of the first fossil evidence of dinosaur parenting. Housed at Staffin Museum, a rock slab shows the footprints of baby dinosaurs, together with the print of an adult. It is expected that Skye is also home to fossil remains of flying reptiles, and confirmation of this will firmly place the island in the international dinosaur hall of fame.

Minister for the Natural Environment Mairi Gougeon said:

"Skye lays claim to the most significant dinosaur discoveries of Scotland's Jurassic past and this Nature Conservation Order is a vital step in protecting and preserving this important part of our natural heritage for future generations.

"The Order gives extra legal protection to these special sites whilst providing for important artefacts to be collected responsibly for science and public exhibition, as Dugald Ross of the Staffin Museum has been doing since his first important discovery in 1982.

"I hope the Order gives even greater awareness of the significance of these important sites, and the important and valuable role everyone has in helping protect them."

SNH geologist, Colin MacFadyen said:

"This vital extra legal protection is important to ensure Skye's unique dinosaur heritage is available for everyone to learn from and enjoy.

"The NCO covers areas of coastline where 165 million year old Middle Jurassic sedimentary rocks are gradually being eroded by the sea. It is crucial that the footprints and actual skeletal remains of dinosaurs and other vertebrates, that are being revealed by nature are protected. These fabulous fossil finds can help answer crucial questions about ancient ecosystems and pave the way for exciting advances in our understanding of vertebrate evolution."

Staffin Museum owner Dugald Ross said:

"Everyone has a role to play in making the Order a success, and we are encouraging local people who think they may have found a vertebrate fossil – or a dinosaur bone or tooth - to contact Staffin Museum for advice. We are encouraging everyone to find, report and help protect - but not collect - Skye's wonderful dinosaur heritage.
Contact information

Name
Cat Synnot
Email
cat.synnot@nature.scot

Notes to editors

In areas affected by the NCO vertebrate fossils may not be collected, and the public and amateur collectors are being encouraged to contact the police if they witness attempts to remove rock or fossil remains particularly if it involves equipment such as rock saws, crowbars and sledgehammers.

The public, by following the Scottish Fossil Code can still collect easier to find fossil remains of marine Jurassic fossils such as ammonites, lying loose on the beaches of Skye.

The NCO will cover the Skye sites of An Corran, Duntulm Lob Score, Valtos, Elgol and Bearreraig Bay. SNH has consulted landowners, palaeontological research scientists, Police Scotland and the local community, via Community Councils and the Staffin Trust, on the Order, and invited public comment through local media. News of the proposal has also been covered in the national press. To date no concerns have been raised.

Further details on NCOs can be accessed via this link: https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/protected-areas/conservation-orders/nature-conservation-order

Further details on the Scottish Fossil Code can be accessed via this link: https://www.nature.scot/landforms-and-geology/protecting-our-geodiversity/codes-researchers-and-collectors/scottish-fossil-code

The fossil remains of dinosaurs on Skye were first identified in 1984. Since then there has been a steady stream of discovery of rare trace fossils (tracks and/or individual footprints) and associated vertebrate 'body' fossils (such as bones and teeth). Trace and body fossils of both carnivorous and herbivorous dinosaurs have been found. Recent discoveries include some of the first fossil evidence of parenting in dinosaurs and the remains of flying reptile (pterosaurs). Incredibly rare mammalian fossils at Elgol represent another aspect of Skye's Middle Jurassic vertebrate fossil heritage.

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https://www.whatsonskye.com/journal/your-complete-guide-to-dinosaur-hunting-on-skye/
The Skye Nature Conservation Order 2019
https://presscentre.nature.scot/news/dinosaur-sites-on-skye-to-be-given-official-protection#downloads
https://www.nature.scot/dinosaur-sites-skye-be-given-official-protection
Clark, N., 2004, Dinosaur Footprints from the Duntulm Formation (Bathonian, Jurassic) of the Isle of Skye, Scottish Journal of Geology, 40, 1, 13-21. April 2004, DOI: 10.1144/sjg40010013

Site Gazeteer

Site Number	57
Site Name	Drystone Culvert, Harbour Development
Type of Site	Drystrone Culvert
NRHE Number	
HER Number	
Status	Walkover Site
Easting	149315
Northing	868249
Parish	Kilmuir
Council	Highland
Description	Site 57 is comprised of a drystone built culvert running under the road, measuring around 3m wide and up to 1.3m high. It was built with up to 10 courses of flat stone slabs, with large stone lintels forming a narrow drainage passage for a small stream under the road. This culvert was likely built when the original dirt track access to the slipway was upgraded to a tarred road.

Site Number	58
Site Name	Concrete Block, Borrow Pit
Type of Site	Concrete Block
NRHE Number	
HER Number	
Status	Walkover Site
Easting	151840
Northing	860494
Parish	Snizort
Council	Highland
Description	Large concrete blocks with attached iron fittings measuring 0.8m x 0.6m x 0.6m and had both been moved or displaced from its original positions, possibly by quarrying works. The remains of other concrete blocks of varying sizes were visible within other rock piles in the quarry. These may have been part of buildings or machinery associated with the tramway (centred Site 35) or the Diatomite works at Sites 29 and 30, both assets situated approximately 100m to the south of the Borrow Pit .

Site Number	59
Site Name	Concrete Block, Borrow Pit
Type of Site	Concrete Block
NRHE Number	
HER Number	
Status	Walkover Site
Easting	151835
Northing	860490
Parish	Snizort

Council	Highland
Description	Large concrete block with attached iron fittings measuring 1.5m x 0.8m x 0.6m and had been moved or displaced from its original position, possibly by quarrying works. The remains of other concrete blocks of varying sizes were visible within other rock piles in the quarry. These may have been part of buildings or machinery associated with the tramway (centred Site 35) or the Diatomite works at Sites 29 and 30, both assets situated approximately 100m to the south of the Borrow Pit .

Site Number	60
Site Name	Wall, Borrow Pit
Type of Site	Wall
NRHE Number	
HER Number	
Status	Walkover Site
Easting	151891
Northing	860525
Parish	Snizort
Council	Highland
Description	Concrete footings of a wall partly covered by grass and situated at the top of the steep, east facing slope. The wall was aligned north-northeast to south-southwest and measured around 12m long, 0.4m wide and up to 0.4m high, with a second shorter wall running parallel at the northern end. The wall was degraded, and it is possible that some parts of it have eroded downslope or have been removed by later quarrying activities. Based on its location above the Diatomite works (Sites 29 and 30, both assets situated approximately 100m to the south of the Borrow Pit) this may have been associated with the tramway (centred Site 35) or another related building.

Site Number	61
Site Name	Drystone Wall, Borrow Pit
Type of Site	Drystone Revetment Wall
NRHE Number	
HER Number	
Status	Walkover Site
Easting	151896
Northing	860528
Parish	Snizort
Council	Highland
Description	A highly degraded section of drystone-built revetment wall, located a few metres downslope from site 60. The wall survived up to 1m high, with at least six courses of stonework in the best preserved section. The stonework was bulging outwards and some had collapsed downslope. It ran roughly north-northeast to south-southwest along the cliffside for up to 11m but with varying levels of preservation along its length. This wall was also likely to have been associated with the Diatomite works.

Site Number	62
Site Name	Drystone Wall, Borrow Pit
Type of Site	Drystone Revetment Wall
NRHE Number	
HER Number	
Status	Walkover Site
Easting	151902
Northing	860529
Parish	Snizort
Council	Highland
Description	Comprised of a second section of drystone-built, revetment wall located a few metres downslope from site 61. It was also highly degraded, partly grassed-over with collapsed stone on the downslope side. It ran parallel to site 61 and measured around 9m long and up to 0.6m high.

Site Number	63
Site Name	Wall, Borrow Pit
Type of Site	Wall
NRHE Number	
HER Number	
Status	Walkover Site
Easting	151903
Northing	860536
Parish	Snizort
Council	Highland
Description	A concrete and brick wall which may have acted as a stanchion or buttress. It stood up to 1m high, 1m wide, and projected up to 2m out from the hillside. The construction was very mixed and included brick, concrete, and natural boulders. It was located at the northern end of Site 62. It may have formed a support for the other wall or for a structure or mechanism linking the tramway (centred Site 35) above to the Diatomite works (Sites 29 and 30, both assets situated approximately 100m to the south of the Borrow Pit) below.

Site Number	64
Site Name	Turf Bank, near Lealt Quarry
Type of Site	Turf Bank
NRHE Number	
HER Number	
Status	Walkover Site
Easting	151928
Northing	860564

Site Gazeteer

Parish	Snizort
Council	Highland
Description	A turf bank with a stone foundation spread up to 1.8m wide and surviving up to 0.5m high. The bank ran north to south for approximately 33m along the upper edge of the steep slope. The north end had been truncated by later quarrying works. It appears to be the remains of a post-medieval boundary dyke, which may have been used to prevent livestock from falling down the cliff.

Appendix G.1: Habitat regulations Appraisal Pre-Screening Report

Habitat Regulations Appraisal Pre-Screening Report

Staffin Community Harbour Development

Date: 29/09/2021

Document Control

	Name	Title	Signature	Date
Author	Jack Clarkson	Environmental Consultant	J Clarkson	14/07/2021
Reviewer	Kirsty Macdonald	Senior Environmental Consultant	K. Macdonald	29/09/2021
Authoriser	Jack Clarkson	Environmental Consultant	J Clarkson	29/09/2021

Effective Date:	29/09/2021

Revision No:	Signature	Comments	Date
1	I. Beaton	For Issue to Client	29/09/2021

Contents

1 Introduction

In support of the Environmental Impact Assessment Report (EIAR), Marine Licence and planning permission applications for the proposed Staffin Community Harbour (SCH) development, this Habitats Regulations Appraisal (HRA) Pre-Screening Report provides information required for the competent authority to carry out an HRA, and, where required, an Appropriate Assessment (AA).

This report is designed to be read in conjunction with the EIAR and directs the reader to the chapters and sections of the EIAR which are relevant to the designated site or qualifying features being discussed.

1.1 Legislative Basis

A HRA is required for this development due to its proximity to multiple Natura 2000 sites. These include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). The legislative context for this requirement is based on Article 6(3) of the Habitats Directive (92/43/EEC), Article 4(4) of the Birds Directive (2009/147/EC) and is implemented in Scotland through The Conservation (Natural Habitats, &c Regulations 1994 (the Habitats Regulations).

In Scotland, the Scottish Planning Policy document ensures that Ramsar sites, which are normally included in an HRA assessment, overlap with Natura sites, and are therefore protected under the same legislation. Therefore, Ramsar sites do not need considered separately as part of this HRA Screening report.

If a likely significant effect (Van Alsenoy, Bernard, & Van Grieken, 1993) is predicted on a Natura Site at the first stage of the HRA, then an AA must then be carried out. The AA must demonstrate that the proposal will not adversely affect the integrity of the site (NatureScot, 2021a).

It is the responsibility of the competent authority to carry out the HRA based on robust, scientific information provided by the project developer about the proposed project. It is not the role of the developer to make an assessment on whether the proposal will have an adverse effect on any associated Natura sites.

1.2 Terminology

The terminology employed as part of the HRA process relates to likely significant effects (LSEs). It is important when reading the HRA, to be aware that the term 'significant/significance' has different meaning. The 'significant/significance' terminology used as part of the ecological impact assessments in EIAR chapters refers to significance based on a systematic assessment matrix. In this HRA Pre-Screening report, the use of the word 'significant' relates to potential ecological connectivity.

Assessment of LSEs take a precautionary approach and ask whether a project may have an effect, or have the possibility of having an effect, on a Natura site (NatureScot, 2021b). A project component is said to have an LSE on a designated site if there is ecological connectivity with the site's qualifying interests or there is the potential for the conservation objectives of the designated site to be undermined. Where an LSE "*cannot be excluded, on the basis of objective information*" (European Court of Justice C-127/02, 2004) an AA is required. The conservation objectives of the site provide the framework for considering the potential for LSEs.

1.3 Objectives

The objectives of this HRA Pre-Screening report are to summarise:

- The proposed development details;
- The Natura 2000 sites considered, with reference to the SCH development, along with these sites' qualifying interests and conservation objectives; and
- Details on the qualifying interests for each of the scoped-in Natura sites.

This information will aid the competent authority in carrying out an HRA. This HRA Pre-Screening Report provides a reference as to where the relevant information required to complete the HRA is located within the EIAR. As such, the HRA should be read in conjunction with the EIAR and not as a stand-alone document. An indication of whether LSEs are expected is given for each designated site, but it is ultimately up to the competent authority carrying out the HRA to ascertain whether LSEs are present, and therefore whether an AA is needed for each designated site.

2 Project Summary

The proposed SCH development is located within Òb nan Ron, Garafad, Staffin in the north of Skye (grid reference: NG494 681). The SCH hope to create an attractive multi-user harbour at the site location but cannot do this without upgrading the slipway. At present, the layout of the current slipway lacks sufficient berthing and launching boats is dependent on the tides. To increase the functionality of the slipway, the proposed development involves both onshore and offshore aspects of development.

Offshore works include:

- Upgrading the existing Staffin Slipway to increase berthing opportunities;
- Constructing sheltered berthing by installing pontoons and a breakwater;
- Land Reclamation; and
- Installation of a new slipway.

Onshore works will include:

- Construction of parking, pontoon access, storage, and toilets to support the slipway operations;
- Extended hardstanding to the east of the site through reclamation in the foreshore area; and
- Borrow pit operations to source rock armour for the breakwater and reclaimed area. It is proposed that the Lealt Quarry, located approximately 7km south of Òb nan Ron (NG 51879 60595), is reopened as a Borrow Pit to provide a local source of rock material.

Further details on the project description as well as each individual element of the proposed project can be found in the EIAR Chapter 2: Project Description.

Due to the development's proximity to numerous Natura 2000 sites and the potential for numerous aspects of the construction process to have some degree of connectivity with the qualifying features of Natura 2000 sites, a HRA is required. Information on the designated sites and qualifying features relevant to the proposed SCH development and therefore taken into consideration, can be found in Section 3: Designated Sites of this report.

3 Designated Sites

The designated sites and their qualifying interests relevant to the proposed SCH development and the Borrow Pit are shown in Table 3.1. The sites, or species within the sites, are scoped in or out depending on the level of ecological connectivity to the proposed works. A reduced list of designated sites and features is then taken forward for further assessment. Explanations for why certain sites or qualifying features are excluded is laid out in Section 3.1.

Only Special Areas of Conservation (SACs) and Special Protections Areas (SPAs) are considered, as together, they make up the Natura 2000 Network.

Table 3.1: Designated Sites Relevant to the Proposed Staffin Community Harbour Development and the Borrow Pit

Site	Distance and Direction	Qualifying Feature(s)	Relevant to proposed harbour development or Borrow Pit?	Included in Further Assessment?
Special Areas of Conservation (SACs)				
Inner Hebrides & The Minches SAC	~ 0km from harbour development, ~ 0.3km E from Borrow Pit	Harbour porpoise (*Phocoena)* - **favourable maintained**	Harbour development only	IN – there is the potential for construction activities to impact on the qualifying features of the SAC due to the proximity between the harbour development, and the SAC.
Trotternish Ridge SAC	~ 3km W of harbour development ~ 3.8km SW of Borrow Pit	Alpine and subalpine calcareous grasslands; Dry heaths; Montane acid grasslands; Base-rich scree; High-altitude plant communities associated with areas of water-seepage; Plants in crevices on base-rich rocks; Species-rich grassland with may-grass in upland areas; Tall herb communities	Borrow Pit only	OUT – there is no connectivity between the development areas and the qualifying features of the designated site as the qualifying features are immobile.
Rigg – Bile SAC	~ 4.7 km S of Borrow Pit	Maritime cliffs; Upland mixed ash woodland; Mixed woodland on base-rich soils associated with rocky	Borrow Pit only	OUT – there is no connectivity between the development areas and the qualifying features of the designated site.

Site	Distance and Direction	Qualifying Feature(s)	Relevant to proposed harbour development or Borrow Pit?	Included in Further Assessment?
		slopes and vegetated sea cliffs.		
Ascrib, Isay & Dunvegan SAC	~ 29km by sea WSW of harbour development, ~21.5km WNW of Borrow Pit	Common seal (*Phoca vitulina)* - **unfavourable declining**	Harbour development only	IN – the distance between the construction area and designated site is within the known range of common seals.
Sligachan Peatlands SAC	~ 35km S of harbour development, ~ 27.5km S of Borrow Pit	Acid peat-stained lakes and ponds; Blanket bog; Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels; Depressions or peat substrates; Very wet mires often identified by an unstable 'quaking' surface; Wet heathland with cross-leaved heath	Borrow Pit only	OUT – the designated site and its qualifying features are too far from the proposed development to be affected.
Beinn Bhan SAC	~34km SE of harbour development, ~27km SE of Borrow Pit	Acidic scree; Dry heaths; Alpine and subalpine heaths; Montane acid grasslands; Plants in crevices on acid rocks; Tall herb communities; Wet heathland with cross-leaved heath	Borrow Pit only	OUT – the designated site and its qualifying features are too far from the proposed development to be affected.
Inverasdale Peatlands SAC	~ 34km NE of harbour development, ~ 38km NE of Borrow Pit	Blanket bog	Borrow Pit only	OUT – the designated site and its qualifying features are too far from the proposed development to be affected.
Monach Islands SAC	~ 102km W of harbour development by sea, ~	Grey seals (*Halichoerus grypus*) - **favourable maintained**; Dune grassland; Machair;	Harbour development only	IN – (grey seals only) the distance between the construction area and designated site is within the known foraging range

Site	Distance and Direction	Qualifying Feature(s)	Relevant to proposed harbour development or Borrow Pit?	Included in Further Assessment?
	102km W of Borrow Pit	Shifting dunes with marram		of grey seals. Other features are immobile and are too far from the proposed development to be considered.
Sound of Barra SAC	~ 102km SW of harbour development by sea, ~ 83km SW of Borrow Pit	Common seal (*Phoca vitulina)* - **no condition stated**; Reefs; Subtidal sandbanks	Harbour development only	OUT – the distance between the construction area and designated site is outwith the known foraging range of common seals. Reef features are immobile and are too far from the proposed development to be considered.
Treshnish Isles SAC	~ 102km SW of harbour development by sea, ~ 83km SW of Borrow Pit	Grey seals (*Halichoerus grypus*) - **favourable maintained**; Reefs	Harbour development only	IN – (grey seals only) the distance between the construction area and designated site is within the known foraging range of grey seals
East Mingulay SAC	~ 125km SSW of harbour development by sea, ~ 105km SW of Borrow Pit	Reefs	Harbour development only	OUT – the designated site and its qualifying features are too far from the proposed development to be affected.
North Rona SAC	~ 165km NNE of harbour development by sea, ~ 165km NNE of Borrow Pit	Grey seals (*Halichoerus grypus*) - **favourable maintained**; Reefs; Vegetated sea cliffs; Sea caves	Harbour development only	IN – (grey seals only) the distance between the construction area and designated site is within the known foraging range of grey seals. Other features are immobile and are too far from the proposed development to be considered.
Southeast Islay Skerries SAC	~ 262 km S of harbour development by sea, ~ 262km S of Borrow Pit	Common seal (*Phoca vitulina*) - **favourable maintained**	Harbour development only	OUT – the distance between the construction area and designated site is outwith the known foraging range of common seals.

Site	Distance and Direction	Qualifying Feature(s)	Relevant to proposed harbour development or Borrow Pit?	Included in Further Assessment?
Special Protected Areas (SPAs)				
Shiant Isles SPA	~ 25km NNW of harbour development, ~ 35km NNW of Borrow Pit	Fulmar (*Fulmarus glacialis*), breeding - **unfavourable declining**; Greenland barnacle goose (*Branta leucopsis*), non-breeding - **favourable recovered**; Guillemot (*Uria aalge*), breeding - **unfavourable no change**; Kittiwake (*Rissa tridactyla*), breeding - **unfavourable no change**; Puffin (*Fratercula arctica*), breeding - **favourable maintained**; Razorbill (*Alca torda*), breeding - **favourable recovered**; Shag (*Phalacrocorax aristotelis*), breeding - **unfavourable no change**; Seabird assemblage, breeding - **unfavourable declining**	Both	IN – for Guillemot, Kittiwake and Razorbill only. There is the potential for construction activities to impact on these qualifying features as these species have been found to be present in the development areas. The distance between the two areas is also within the range at which the qualifying features forage.
Cuillins SPA	~ 34km S of harbour development, ~ 27km S of Borrow Pit	Golden eagle (*Aquila chrysaetos*), breeding - **favourable maintained**	Both	OUT – there is little connectivity between the development areas and the qualifying features of the designated site. The development area provides unsuitable foraging, nesting, and breeding habitat for Golden eagle.
Priest Island (Summer Isles)	~ 55km NE of harbour development, ~ 55km NNE of Borrow Pit	Storm petrel (*Hydrobates pelagicus*), breeding - **favourable maintained**	Both	OUT – there is little connectivity between the development areas and the qualifying features of the designated site. The development area provides unsuitable

Site	Distance and Direction	Qualifying Feature(s)	Relevant to proposed harbour development or Borrow Pit?	Included in Further Assessment?
				nesting and breeding habitat for Storm petrel.
Rum SPA	~ 60km S of harbour development, ~ 53km S of Borrow Pit	Golden eagle (*Aquila chrysaetos*), breeding - **favourable maintained**; Guillemot (*Uria aalge*), breeding - **unfavourable no change**; Kittiwake (*Rissa tridactyla*), breeding - **unfavourable no change**; Manx shearwater (*Puffinus puffinus*), breeding - **favourable maintained**; Red-throated diver (*Gavia stellata*), breeding - **favourable maintained**; Seabird assemblage, breeding - **favourable maintained**		OUT – although Guillemot and Kittiwake have been recorded in low densities in the development area, there is very little connectivity between the development areas and the qualifying features of the designated site due to the distance between the sites.
Canna & Sanday SPA	~ 60km SSW of harbour development, ~ 53km SSW of Borrow Pit	Guillemot (*Uria aalge*), breeding - **unfavourable declining**; Kittiwake (*Rissa tridactyla*), breeding - **unfavourable declining**; Puffin (*Fratercula arctica*), breeding - **favourable maintained**; Shag (*Phalacrocorax aristotelis*), breeding - **favourable maintained**; Herring gull (*Larus argentatus*), breeding - **unfavourable declining**; Seabird assemblage, breeding - **unfavourable declining**	Both	OUT – although Guillemot and Kittiwake have been recorded in low densities in the development area, there is very little connectivity between the development areas and the qualifying features of the designated site due to the distance between the sites.
West Coast of the Outer	~ 90km W of harbour development, ~ 90km	Black-throated diver (*Gavia arctica*), non-breeding;	Both	OUT – there is no connectivity between the development areas and the qualifying features of

Site	Distance and Direction	Qualifying Feature(s)	Relevant to proposed harbour development or Borrow Pit?	Included in Further Assessment?
Hebrides SPA	WNW of Borrow Pit	Eider (*Somateria mollissima*), non-breeding; Great northern diver (*Gavia immer*), non-breeding; Long-tailed duck (*Clangula hyemalis*), non-breeding; Red-breasted merganser (*Mergus serrator*), non-breeding; Red-throated diver (*Gavia stellata*), breeding; Slavonian grebe (*Podiceps auritus*), non-breeding		the designated site. The development area is out with the typical foraging range of the qualifying, as well as providing unsuitable nesting and breeding habitats.
Handa SPA	~ 100km NE of harbour development, ~ 100km NNE of Borrow Pit	Guillemot (*Uria aalge*), breeding - **unfavourable no change**; Kittiwake (*Rissa tridactyla*), breeding - **unfavourable declining**; Great Skua (*Stercorarius skua*), breeding - **favourable maintained**; Razorbill (*Alca torda*), breeding - **unfavourable declining**; Fulmar (*Fulmarus glacialis*), breeding - **unfavourable no change**; Seabird assemblage; breeding - **unfavourable declining**	Both	OUT – there is no connectivity between the development areas and the qualifying features of the designated site. The development area is out with the typical foraging range of the qualifying, as well as providing unsuitable nesting and breeding habitats.

3.1 Reasons for Designated Sites or Species Exclusions

3.1.1 Trotternish Ridge SAC

Trotternish Ridge is one of five sites on the oceanic west coast of Scotland representing species rich Nardus grasslands (JNCC 2021a). The grasslands are rich in both vascular plants and bryophytes, though heavy grazing on the slopes may be limiting species-richness (JNCC 2021a). The area is also representative of mildly calcareous and calcschist screes that host rich

floral diversity (JNCC 2021a). Dust deposition from construction activities is most likely to affect vegetation, however, dust particles associated with construction are unlikely to be transported large distances. At present, the main threats to the qualifying features of the site are associated with farming practices and livestock grazing. Despite the site only being approximately 3km away from the closest development area, it is unlikely that the qualifying features of the site will be impacted by construction activities. As such, it has not been taken forward for assessment.

3.1.2 Rigg – Bile SAC

Rigg – Bile SAC stretches along an 11.5km length of coastline in the south-east of the Trotternish peninsula. The site covers an area of almost 500ha and includes some of the best examples of vegetated sea cliff habitats in the whole of the UK. These limestone cliffs support vascular species including mountain avens (Dryas octopetala), hairy rockcress (Arabis hirsuta), and melancholy thistle (Cirsium heterophyllum), as well as rupestral bryophytes such as Schistidium robustum. In many places, this coastal flora naturally transitions to a woodland dominated by hazel, birch, and willow further inland. Due to the non-mobile nature of the designated features of this site and the distance from the development, it is not anticipated that there will be any connectivity between these potential receptors and the proposed SCH development or Borrow Pit. It is therefore not taken forward for assessment.

3.1.3 Sligachan Peatlands SAC

Sligachan is one of two sites on Skye representing two unusual and distinct mire types. Sligachan displays an enormous variety of blanket bog features and dystrophic pools and lochans which sit in a complex terrain of slopes, ridges, knolls, and hollows that support blanket bog and oceanic mires (JNCC 2021b). The SAC is situated a considerable distance, approximately 27km south, from the Borrow Pit. Construction activities associated with all aspects of the development will therefore have no connectivity with the qualifying features of this site and as such, it has not been taken forward for assessment.

3.1.4 Beinn Bhan SAC

The Beinn Bahn SAC is designated for the conservation of a variety of flora. The high cliffs of Beinn Bahn support a range of upland plant communities include alpine and sub-alpine heaths, ledge vegetation dominated by tall herbs and types adapted to survive amongst the acidic scree. The summit plateaux are dominated by alpine and subalpine heaths and on rocky ground close to the top of the main ridge there are examples of dwarf juniper heath. As the site is designated approximately 27km SE of the Borrow Pit and on the opposite coastline (mainland Scotland), no connectivity is anticipated between this site and the SCH development. As such, it has not been taken forward for assessment.

3.1.5 Inverasdale Peatlands SAC

This relatively low-altitude site lies on a large peninsula in Wester Ross, mainland Scotland. The peatlands host numerous species of vegetation, namely white and brown beak sedges, and *sphagnum* mosses (JNCC 2021c). As the site is designated approximately 34km NE of the proposed SCH development and on the opposite coastline, no connectivity is anticipated between this site and the proposed SCH development. As such, it has not been taken forward for assessment.

3.1.6 East Mingulay SAC

No connectivity exists between the proposed SCH development and the site's reef features, due to the distance between these areas (~125km). As such, no negative effects on this site, or its qualifying features are expected, and it is not taken forward for assessment.

3.1.7 SACs Designated for Marine Mammal Features

There are seven SACs in Table 3.1 that are designated for either harbour porpoise, harbour, or grey seal. Two of the seven SACs have little to no degree of connectivity to the proposed development and thus are not taken forward for assessment. These sites are the Sound of Barra and the Southeast Islay Skerries SACs. Each of these SACs are designated for common seals and are nationally important to support breeding populations, providing haul-outs sites for breeding and moulting. Common seals are primarily a coastal species but have been known to travel distances of more than 100km away from their haul-out sites (Thompson *et al*., 1998; Wilson *et al*., 2015). Despite this, common seals in Scotland typically have a foraging range of approximately 4 – 55km (Thompson et al 1998). As the Sound of Barra and the Southeast Islay Skerries SACs are ~100km and ~260km away from the proposed development, they have not been taken forward for assessment.

3.1.8 SPAs Designated for Ornithological Features

There are seven SPAs in Table 3.1 that are designated for various ornithological species. Six of the seven SPAs are located ~30 - 100km away from the proposed development areas and have little to no degree of connectivity to the proposed development.

One site, the Cuillin SPA, is designated for golden eagle (*Aquila chrysaetos*) and supports nationally important breeding and nesting populations. Golden eagles have a core range of 6km, with maximum range of up to 9km. In addition, golden eagle alternative nesting sites are often less than 3km apart in high-density areas, up to 6km apart elsewhere. These ranges, coupled with the development areas lack of suitable habitat for golden eagle, makes it unlikely for them to be present within the development area (NatureScot. 2016).

An initial ornithological survey will be conducted prior to construction to ascertain whether the remaining avian species associated with the six SPAs are utilising the site.

3.2 Designated Site Information

The Conservation Objectives of each of the designated sites taken forward is provided under each designated site section. Information on where the assessment for the qualifying features or species for each site is then provided.

3.2.1 Inner Hebrides & The Minches SAC

The conservation objectives for the Inner Hebrides & The Minches SAC are shown in Table 3.2 and the qualifying features are shown in Table 3.3.

A degree of connectivity has been identified between the Inner Hebrides & The Minches SAC and the proposed development works due to the highly mobile nature of the site's qualifying feature of harbour porpoise. This, combined with the techniques likely to be utilised during the construction of the development, means that there is the potential for the works to have an LSE on the site. Therefore, it is likely an AA will be required.

Table 3.2 Inner Hebrides & The Minches SAC Conservation Objectives

Conservation Objective of the Designated Site	Section of the Supporting Document to inform the Assessment
Overarching Conservation Objective: To ensure that the habitat of the qualifying species (Harbour porpoise, *Phocoena phocoena*), or disturbance to the qualifying species does not significantly deteriorate the condition of the site. The site must maintain an appropriate condition to achieve favourable conservation status.	Section 10.4: Baseline of Chapter 10: Marine Mammals Section 10.4.1.1: Inner Hebrides & the Minches SAC of Chapter 10: Marine Mammals
Further Conservation Objective: To ensure for the qualifying species that the following are maintained in the long term: • No significant disturbance that can contribute to a decline in the ability of the qualifying feature's ability to survive; • High density of species across the site; • Population of the species as a viable component of the site; • Distribution of the species within site; • Distribution and extent of habitats supporting the species; and • Structure, function and supporting processes of habitats supporting the species.	Section 10.5.1: Construction (Impact Assessment) of Chapter 10: Marine Mammals Section 10.5.2: Operations (Impact Assessment) of Chapter 10: Marine Mammals In Addition: Chapter 17: Water Quality & Coastal Processes

Table 3.3 Inner Hebrides & The Minches SAC Qualifying Feature

Qualifying Feature	Summary of Assessment
Harbour porpoise (*Phocoena phocoena)*	In the absence of mitigation procedures, there is potential to cause moderate disturbance and possible injury to harbour porpoises designated under the SAC. The dismantling of the existing and construction of the new breakwater (through land reclamation) is situated within the designated site. As such, there is a risk of injury to harbour porpoise because of falling material. Such impacts are unlikely but could have impounding effects on harbour porpoise as a viable component of the site if they become injured. In addition, the land reclamation and construction processes associated with the breakwater and construction of rock armouring has the potential to increase sediment suspension. Harbour porpoise use echolocation to find, track, and intercept individual prey (Wisniewska *et al.*, 2016) and it is therefore unlikely that increased sedimentation will impair their foraging abilities if in the harbour development area. Pollutants released into the water as a result of the release of hydraulic oils or fluids from vessels and the spillage of onshore fluids and/or chemicals can have negative, direct, or indirect, implications on harbour porpoise. In the unlikely event of a pollution incident, the scale of the event is likely to be too

	small to cause significant disturbance that could contribute to a decline in the ability of harbour porpoise to survive. Once the harbour is constructed it will be able to accommodate 15 large berths and 12 small berths. Sections of pontoon will be attached together using a hand-held drill, although there will be no drilling or piling into the seabed for the installation of the pontoons. This will allow berthing for leisure vessels, tourism orientated boats and boats/landing crafts associated with fish farms and the creel fishing industry in the area. Although underwater noise impacts are unlikely during the installation of the pontoons, increased vessel numbers travelling to and from the proposed SCH development during both construction and operational phases may increase ambient underwater noise and increase the risk of vessel collisions. This, in turn, could contribute to significant disturbance(s) which attribute to a decline in the ability of the qualifying feature's ability to survive. LSE cannot be ruled out for underwater noise emissions nor vessel collisions relating to increased vessel traffic, despite low likelihood of exposure. LSEs are unlikely when taking into consideration the likelihood of exposure to new pollution indices and for injury during the dismantling and construction of the breakwater. LSEs associated with sediment suspension are unlikely. In the absence of mitigation procedures, there is the potential to cause moderate disturbance and possible injury to the harbour porpoises designated under the SAC.

3.2.2 Ascrib, Isay & Dunvegan SAC

The conservation objectives for the Ascrib, Isay & Dunvegan SAC are shown in Table 3.4 and the qualifying features are shown in Table 3.5.

A degree of connectivity has been identified between the Ascrib, Isay & Dunvegan SAC and the proposed development works due to the highly mobile nature of the site's qualifying feature of common seal. This, combined with the techniques likely to be utilised during the construction of the development, means that there is the potential for the works to have an LSE on the site. Therefore, it is likely an AA will be required.

Table 3.4 Ascrib, Isay & Dunvegan SAC Conservation Objectives

Conservation Objective of the Designated Site	Section of the Supporting Document to inform the Assessment
Overarching Conservation Objective: To avoid deterioration of the habitats of qualifying species (common seal, *Phoca vitulina*) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest.	Section 10.4: Baseline of Chapter 10: Marine Mammals Section 10.4.1.2: Ascrib, Islay, & Dunvegan SAC of Chapter 10: Marine Mammals
Further Conservation Objective: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within site;	Section 10.5.1: Construction (Impact Assessment) of Chapter 10: Marine Mammals

• Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species.	Section 10.5.2: Operations (Impact Assessment) of Chapter 10: Marine Mammals In Addition: Chapter 17: Water Quality & Coastal Processes

Table 3.5 Ascrib, Isay & Dunvegan SAC Qualifying Feature

Qualifying Feature	Summary of Assessment
Common seals (Phoca vitulina)	In the absence of mitigation procedures, there is potential to cause moderate disturbance and possible injury to common seals designated under the SAC. The dismantling of the existing and construction of the new breakwater (through land reclamation) is situated outwith the designated site. Common seals however are known in Scotland typically to have a foraging range of approximately 4 – 55km (Thompson et al 1998). As such, common seals could be within the construction area of the development, either in the water or hauled out close to site following a foraging event. There is a risk of injury to common seal as a result of falling material during the breaking and construction of the breakwater. Such impacts are unlikely but could have impounding effects on common seals as a viable component of the SAC if they become injured and have arrived from the SAC. In addition, the land reclamation and construction processes associated with the breakwater construction of rock armouring has the potential to increase sediment suspension in the water column. Common seals do not use

	acoustics or echolocation to find, track, and intercept individual prey (Wisniewska *et al.*, 2016) items as they are visual predators. Increased sediment suspension in the water column therefore has the potential to inhibit common seal foraging and cause seals to avoid affected areas as visual acuity decreases (Todd *et al.*, 2015). Increased sediment suspension therefore has the potential to cause significant disturbance to common seals of the Ascrib, Isay & Dunvegan SAC. Pollutants released into the water as a result of the release of hydraulic oils or fluids from vessels and the spillage of onshore fluids and/or chemicals can have negative, direct, or indirect, implications on common seal. In the unlikely event of a pollution incident, the scale of the event is likely to be too small to affect the designated site and its qualifying features if they are present in the construction area. Once the harbour is constructed it will be able to accommodate 15 large berths and 12 small berths. Sections of pontoon will be attached together using a hand-held drill, although there will be no drilling or piling into the seabed for the installation of the pontoons. This will allow berthing for leisure vessels, tourism orientated boats and boats/landing crafts associated with fish farms and the creel fishing industry in the area. Although underwater noise impacts are unlikely during the installation of the pontoons, increased vessel numbers travelling to and from the proposed SCH development during both construction and operational phases may increase ambient underwater noise and increase the risk of vessel collision on common seal. In addition, onshore activities associated with the construction of utilities has the potential to cause disturbance to common seals hauled out close the development area, both visually and acoustically. 'Flight/fleeing' initiation has been observed in common seals when a 'visual' disturbance has been detected ~165 – 260 m away. In addition, seals have been known to flush into the water when there has been the presence of construction vehicles < ~200 m away. However, the distance at which seals become alert and begin to move towards the water can be as much as 500–800m at some sites (Anderson *et al.*, 2012; Wilson *et al.*, 2011; Henry & Hammill, 2001). LSE cannot be ruled out for in-air noise/visual sources of disturbance for hauled out seals, underwater noise emissions nor vessel collisions relating to increased vessel traffic, despite low likelihood of exposure. LSEs are unlikely when taking into consideration the likelihood of exposure to new pollution indices and for injury during the dismantling and construction of the breakwater. LSEs associated with sediment suspension and underwater noise are unlikely. In the absence of mitigation procedures, there is the potential to cause moderate disturbance and possible injury to the common seals designated under the SAC.

3.2.3 Monach Islands SAC

The conservation objectives for the Monach Islands SAC are shown in Table 3.6 and the qualifying features are shown in Table 3.7.

A degree of connectivity has been identified between the Monach Islands SAC and the proposed development works due to the highly mobile nature of the site's qualifying feature of grey seal. This, combined with the techniques likely to be utilised during the construction

of the development, means that there is the potential for the works to have an LSE on the site. Therefore, it is likely an AA will be required.

Table 3.6 Monach Islands SAC Conservation Objectives

Conservation Objective of the Designated Site	Section of the Supporting Document to inform the Assessment
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species (grey seal, *Halichoerus grypus*) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features.	Section 10.4: Baseline of Chapter 10: Marine Mammals Section 10.4.1.5: Monach Islands SAC of Chapter 10: Marine Mammals
Further Conservation Objective: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; • No significant disturbance of the species.	Section 10.5.1: Construction (Impact Assessment) of Chapter 10: Marine Mammals Section 10.5.2: Operations (Impact Assessment) of Chapter 10: Marine Mammals In Addition: Chapter 17: Water Quality & Coastal Processes

Table 3.7 Monach Islands SAC Qualifying Feature

Qualifying Feature	Summary of Assessment
Grey seals (Halichoerus grypus)	In the absence of mitigation procedures, there is potential to cause moderate disturbance and possible injury to grey seals designated under the SAC. The dismantling of the existing and construction of the new breakwater (through land reclamation) is situated outwith the designated site. Grey seal foraging ranges are wide ranging and can often extend as far as 100km between haul out sites (SCOS, 2018). The upper limits of the range of grey seals are comparative to the distance between the Monach Islands SAC and the proposed SCH development, presenting the possibility that they could be present within the development site. Thus, there is a risk of injury to grey seal as a result of falling material during the breaking and construction of the breakwater. Such impacts are unlikely but could have impounding effects on grey seals as a viable component of the SAC if they become injured and have arrived from the SAC.

	In addition, the land reclamation and construction processes associated with the breakwater construction of rock armouring has the potential to increase sediment suspension in the water column. Grey seals do not use acoustics or echolocation to find, track, and intercept individual prey (Wisniewska *et al*., 2016) items as they are visual predators. Increased sediment suspension in the water column therefore has the potential to inhibit grey seal foraging and cause seals to avoid affected areas as visual acuity decreases (Todd *et al.,* 2015). Increased sediment suspension therefore has the potential to cause significant disturbance to grey seals of the Monach Islands SAC if they are foraging within the vicinity of the development. Pollutants released into the water as a result of the release of hydraulic oils or fluids from vessels and the spillage of onshore fluids and/or chemicals can have negative, direct, or indirect, implications on grey seal. In the unlikely event of a pollution incident, the scale of the event is likely to be too small to affect the designated site and its qualifying features if they are present in the construction area. Once the harbour is constructed it will be able to accommodate 15 large berths and 12 small berths. Sections of pontoon will be attached together using a hand-held drill, although there will be no drilling or piling into the seabed for the installation of the pontoons. This will allow berthing for leisure vessels, tourism orientated boats and boats/landing crafts associated with fish farms and the creel fishing industry in the area. Although underwater noise impacts are unlikely during the installation of the pontoons, increased vessel numbers travelling to and from the proposed SCH development during both construction and operational phases may increase ambient underwater noise and increase the risk of vessel collision on grey seal. Although fewer studies of grey seal disturbance have been undertaken, activities associated with the construction of utilities has the potential to cause disturbance to grey seals hauled out close the development area, both visually and acoustically. 'Flight/fleeing' initiation has been observed in grey seals but levels of habituation to disturbance appear to be greater than that of harbour seals. Upon 'visual' detections of boat disturbance ~20 – 70 m away, grey seals have been known to flush into the water (Strong & Morris, 2010). However, the distance at which seals become alert and begin to move towards the water can be as much as 500–800m at some sites (Anderson *et al*., 2012; Wilson *et al*., 2011; Henry & Hammill, 2001). LSE cannot be ruled out for in-air noise/visual sources of disturbance for hauled out seals, underwater noise emissions nor vessel collisions relating to increased vessel traffic, despite low likelihood of exposure. LSEs are unlikely when taking into consideration the likelihood of exposure to new pollution indices and for injury during the dismantling and construction of the breakwater. LSEs associated with sediment suspension are unlikely. In the absence of mitigation procedures, there is the potential to cause moderate disturbance and possible injury to the grey seals designated under the SAC.

3.2.4 Treshnish Isles SAC

The conservation objectives for the Treshnish Isles SAC are shown in Table 3.8 and the qualifying features are shown in Table 3.9.

A degree of connectivity has been identified between the Treshnish Isles SAC and the proposed development works due to the highly mobile nature of the site's qualifying feature of grey seal. This, combined with the techniques likely to be utilised during the construction of the development, means that there is the potential for the works to have an LSE on the site. Therefore, it is likely an AA will be required.

Table 3.8 Treshnish Isles SAC Conservation Objectives

Conservation Objective of the Designated Site	Section of the Supporting Document to inform the Assessment
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species (grey seal, *Halichoerus grypus*) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features.	Section 10.4: Baseline of Chapter 10: Marine Mammals Section 10.4.1.7: Treshnish Isles SAC of Chapter 10: Marine Mammals
Further Conservation Objective: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; • No significant disturbance of the species.	Section 10.5.1: Construction (Impact Assessment) of Chapter 10: Marine Mammals Section 10.5.2: Operations (Impact Assessment) of Chapter 10: Marine Mammals In Addition: Chapter 17: Water Quality & Coastal Processes

Table 3.9 Treshnish Isles SAC Qualifying Feature

Qualifying Feature	Summary of Assessment
Grey seals (Halichoerus grypus)	In the absence of mitigation procedures, there is potential to cause moderate disturbance and possible injury to grey seals designated under the SAC. The dismantling of the existing and construction of the new breakwater (through land reclamation) is situated outwith the designated site. Grey seal foraging ranges are wide ranging and can often extend as far as 100km between haul out sites (SCOS, 2018). The upper limits of the range of grey seals are comparative to the distances grey seals can travel to haul out sites (75 – 100km per day) (McConnell *et al.*, 1999) between the Treshnish Isles SAC and the proposed SCH development, presenting the possibility that they could be present within the development site. Thus, there is a risk of injury to grey seal as a result of falling material during the breaking and construction of the breakwater. Such impacts are unlikely but could have

	impounding effects on grey seals as a viable component of the SAC if they become injured and have arrived from the SAC. In addition, the land reclamation and construction processes associated with the breakwater construction of rock armouring has the potential to increase sediment suspension in the water column. Grey seals do not use acoustics or echolocation to find, track, and intercept individual prey (Wisniewska *et al*., 2016) items as they are visual predators. Increased sediment suspension in the water column therefore has the potential to inhibit grey seal foraging and cause seals to avoid affected areas as visual acuity decreases (Todd *et al*., 2015). Increased sediment suspension therefore has the potential to cause significant disturbance to grey seals of the Treshnish Isles SAC if they are foraging within the vicinity of the development. Pollutants released into the water as a result of the release of hydraulic oils or fluids from vessels and the spillage of onshore fluids and/or chemicals can have negative, direct, or indirect, implications on grey seal. In the unlikely event of a pollution incident, the scale of the event is likely to be too small to affect the designated site and its qualifying features if they are present in the construction area. Once the harbour is constructed it will be able to accommodate 15 large berths and 12 small berths. Sections of pontoon will be attached together using a hand-held drill, although there will be no drilling or piling into the seabed for the installation of the pontoons. This will allow berthing for leisure vessels, tourism orientated boats and boats/landing crafts associated with fish farms and the creel fishing industry in the area. Although underwater noise impacts are unlikely during the installation of the pontoons, increased vessel numbers travelling to and from the proposed SCH development during both construction and operational phases may increase ambient underwater noise and increase the risk of vessel collision on grey seal. Although fewer studies of grey seal disturbance have been undertaken, activities associated with the construction of utilities has the potential to cause disturbance to grey seals hauled out close the development area, both visually and acoustically. 'Flight/fleeing' initiation has been observed in grey seals but levels of habituation to disturbance appear to be greater than that of harbour seals. Upon 'visual' detections of boat disturbance 20 – 70 m away, grey seals have been known to flush into the water (Strong & Morris, 2010). However, the distance at which seals become alert and begin to move towards the water can be as much as 500–800m at some sites (Anderson *et al*., 2012; Wilson *et al*., 2011; Henry & Hammill, 2001). LSE cannot be ruled out for in-air noise/visual sources of disturbance for hauled out seals, underwater noise emissions nor vessel collisions relating to increased vessel traffic, despite low likelihood of exposure. LSEs are unlikely when taking into consideration the likelihood of exposure to new pollution indices and for injury during the dismantling and construction of the breakwater. LSEs associated with sediment suspension are unlikely. In the absence of mitigation procedures, there is the potential to cause moderate disturbance and possible injury to the grey seals designated under the SAC.

3.2.5 North Rona SAC

The conservation objectives for the North Rona SAC are shown in Table 3.10 and the qualifying features are shown in Table 3.11.

A degree of connectivity has been identified between the North Rona SAC and the proposed development works due to the highly mobile nature of the site's qualifying feature of grey seal. This, combined with the techniques likely to be utilised during the construction of the development, means that there is the potential for the works to have an LSE on the site. Therefore, it is likely an AA will be required.

Table 3.10 North Rona SAC Conservation Objectives

Conservation Objective of the Designated Site	Section of the Supporting Document to inform the Assessment
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species (grey seal, *Halichoerus grypus*) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features.	Section 10.4: Baseline of Chapter 10: Marine Mammals Section 10.4.1.8: North Rona SAC of Chapter 10: Marine Mammals
Further Conservation Objective: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; • No significant disturbance of the species.	Section 10.5.1: Construction (Impact Assessment) of Chapter 10: Marine Mammals Section 10.5.2: Operations (Impact Assessment) of Chapter 10: Marine Mammals In Addition: Chapter 17: Water Quality & Coastal Processes

Table 3.9 North Rona SAC Qualifying Feature

Qualifying Feature	Summary of Assessment
Grey seals (Halichoerus grypus)	In the absence of mitigation procedures, there is potential to cause moderate disturbance and possible injury to grey seals designated under the SAC. The dismantling of the existing and construction of the new breakwater (through land reclamation) is situated outwith the designated site. Grey seal foraging ranges are wide ranging and can often extend as far as 100km between haul out sites (SCOS, 2018). Although the North Rona SAC is ~165km from the development, the upper limits of the range of grey seals are comparative to the distance grey seals can travel between multiple haul out sites and the SCH development, presenting the possibility that they could be present within the development site. Thus, there is a risk of injury to grey

	seal as a result of falling material during the breaking and construction of the breakwater. Such impacts are unlikely but could have impounding effects on grey seals as a viable component of the SAC if they become injured and have arrived from the SAC. In addition, the land reclamation and construction processes associated with the breakwater construction of rock armouring has the potential to increase sediment suspension in the water column. Grey seals do not use acoustics or echolocation to find, track, and intercept individual prey (Wisniewska *et al*., 2016) items as they are visual predators. Increased sediment suspension in the water column therefore has the potential to inhibit grey seal foraging and cause seals to avoid affected areas as visual acuity decreases (Todd *et al*., 2015). Increased sediment suspension therefore has the potential to cause significant disturbance to grey seals of the North Rona SAC if they are foraging within the vicinity of the development. Pollutants released into the water as a result of the release of hydraulic oils or fluids from vessels and the spillage of onshore fluids and/or chemicals can have negative, direct, or indirect, implications on grey seal. In the unlikely event of a pollution incident, the scale of the event is likely to be too small to affect the designated site and its qualifying features if they are present in the construction area. Once the harbour is constructed it will be able to accommodate 15 large berths and 12 small berths. Sections of pontoon will be attached together using a hand-held drill, although there will be no drilling or piling into the seabed for the installation of the pontoons. This will allow berthing for leisure vessels, tourism orientated boats and boats/landing crafts associated with fish farms and the creel fishing industry in the area. Although underwater noise impacts are unlikely during the installation of the pontoons, increased vessel numbers travelling to and from the SCH development during both construction and operation may increase ambient underwater noise and increase the risk of vessel collision on grey seal. Although fewer studies of grey seal disturbance have been undertaken, activities associated with the construction of utilities has the potential to cause disturbance to grey seals hauled out close the development area, both visually and acoustically. 'Flight/fleeing' initiation has been observed in grey seals but levels of habituation to disturbance appear to be greater than that of harbour seals. Upon 'visual' detections of boat disturbance ~ 20 – 70 m away, grey seals have been known to flush into the water (Strong & Morris, 2010). However, the distance at which seals become alert and begin to move towards the water can be as much as 500–800m at some sites (Anderson et al., 2012; Wilson et al., 2011; Henry & Hammill, 2001). LSE cannot be ruled out for in-air noise/visual sources of disturbance for hauled out seals, underwater noise emissions nor vessel collisions relating to increased vessel traffic, despite low likelihood of exposure. LSEs are unlikely when taking into consideration the likelihood of exposure to new pollution indices and for injury during the dismantling and construction of the breakwater. LSEs associated with sediment suspension are unlikely. In the absence of mitigation procedures, there is the potential to cause moderate disturbance and possible injury to the grey seals designated under the SAC.

3.2.6 Shiant Islands SPA

The conservation objectives for the Shiant Islands SPA are shown in Table 3.12 and the qualifying features are shown in Table 3.13.

A degree of connectivity has been identified between the Shiant Islands SPA and the proposed development works due to the highly mobile nature of the site's qualifying features of guillemot, kittiwake, and razorbill. This, combined with the techniques likely to be utilised during the construction of the development, means that there is the potential for the works to have an LSE on the site. Therefore, it is likely an AA will be required.

Table 3.12 Shiant Islands SPA Conservation Objectives

Conservation Objective of the Designated Site	Section of the Supporting Document to inform the Assessment
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.	
Further Conservation Objective: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; • No significant disturbance of the species.	Section 11.5.1 Construction (Impact Assessment) of Chapter 11: Terrestrial Ecology Section 11.5.2 Operations (Impact Assessment) of Chapter 11: Terrestrial Ecology

Table 3.13 Shiant Islands SPA Qualifying Feature

Qualifying Feature(s)	Summary of Assessment
Guillemot (Uria aalge) *Kittiwake (Rissa tridactyla)* *Razorbill (Alca torda)*	Although seabird ecology studies have been restricted to breeding sites and seasons, seabirds spend most of their time at sea. Thus, in the absence of mitigation procedures, there is potential to cause minor disturbance to the foraging pathways of guillemot, kittiwake and razorbill designated under the SAC when taking into consideration the marine aspects of the proposed SCH development. Guillemots are predominantly central place foragers during the breeding season (Bugge *et al.*, 2011), and rarely bring back food for their chicks from areas 30km beyond the colony (Brown & Grice, 2005). Similarly, kittiwakes

	are estimated to have ranges which could extend up to almost 70 km away Daunt *et al*., 2002) and razorbills ~48.5km from the colony (Eastham, 2014). The Shiant Isles SPA however is only ~25km away from the proposed SCH harbour development and low densities of guillemot, kittiwake and razorbill have been recorded within the vicinity of the development. This means that each of these qualifying features could be negatively impacted upon should pollutants be released into the water as a result of the release of hydraulic oils or fluids from vessels and the spillage of onshore fluids and/or chemicals. In addition, they could be impacted indirectly should the same pollution indices affect their prey items. The land reclamation and construction processes associated with the breakwater construction of rock armouring has the potential to increase sediment suspension in the water column. Kittiwakes predominantly feed on sandeels and rely on their vision to forage, much like guillemots and razorbills (Daunt *et al*., 2002). Increased sediment suspension in the water column therefore has the potential to inhibit the foraging success of the qualifying features and cause them to avoid affected areas as visual acuity decreases (Todd *et al*., 2015). Increased sediment suspension therefore has the potential to cause significant disturbance to the qualifying features of the Shiant Islands SAC if they are foraging within the vicinity of the development. LSE cannot be ruled out for potential disturbance to foraging pathways associated with sediment suspension and indirect pollution indices effects, although they remain unlikely. When taking into consideration the likelihood of direct exposure to new pollution indices the scale of the event is likely to be too small to affect the designated site and its qualifying features if they are present in the construction area. In the absence of mitigation procedures, there is the potential to cause minor disturbance to the foraging pathways of the qualifying features designated under the SAC.

4 Cumulative & In- Combination Effects

Cumulative and in-combination effects of the proposed SCH development were assessed as part of the HRA process and were assessed for the following receptors:

- Common seals (*Phoca vitulina*);
- Grey seals (*Halichoerus grypus*); and
- Harbour porpoise (*Phocoena phocoena*).

It has been identified that there is a potential overlap between the construction phase of the SCH development and the construction phases of the following developments: Deep Water Port, Glumaig Bay, Stornoway, Isle of Lewis; Lochmaddy Ferry Terminal Upgrade, Lochmaddy, North Uist; and the Uig Ferry Terminal Upgrade, Uig, Isle of Skye.

With regards to the proposed SCH development and the Uig Ferry Terminal Upgrade development, there are potential impacts on marine mammals during the construction phase due to the proximity of the two developments. Both developments are within the Inner Hebrides and the Minches Special Areas of Conservation, designated for harbour porpoise, and are of similar distance to the sites designated for harbour and grey seals. Cumulative and in-combination impacts associated with underwater noise, increased collision risk and the release of harmful pollutants therefore require careful consideration.

Although there is significant distance between the proposed SCH development, the Stornoway Deep Water Port and the Lochmaddy Ferry Terminal Upgrade developments, potential impacts on marine mammals during the construction phase need to be considered with regards to underwater noise and increased collision risk.

5 Conclusion

The EIAR did not predict any residual adverse impacts on any of the qualifying features of the designated sites assessed as part of this HRA Pre-Screening Report, and no cumulative or in-combination effects are anticipated. Information from this report can be used by the competent authority, in conjunction with the relevant EIAR Chapters and Sections as identified in this report, to carry out the HRA and any necessary AAs. It will be up to the competent authority to ascertain whether the proposal will adversely affect the integrity of the designated sites to be considered.

6 References

Anderson, S.M., Teilmann, J., Dietz, R., Schmidt, N.M., & Miller, L.A. 2012. Behavioural responses of Harbour seals to human-induced disturbances. Aquatic Conservation: Marine and Freshwater Ecosystems. 22: 113-121. Retrieved from https://www.researchgate.net/publication/264400646_Behavioural_responses_of_harbour_seals_to_human-induced_disturbances. Accessed on 11 June 2021

Brown, A., & Grice, P. 2006. Birds of England. London. T & AD Poyser.

Bugge, J., Barrett, R.T., & Pedersen, T. 2011. Optimal foraging in chick-raising Common Guillemots (Uria aalge). Journal of Ornithology. 152: 253-259. Retrieved from https://link.springer.com/article/10.1007/s10336-010-0578-9. Accessed on 11 June 2021

Daunt, F. Benvenuti, S. Harris, M.P., Dall'Antonia, L., Elston, D.A., & Walnless, S. 2002. Foraging strategies of the black-legged kittiwake Rissa tridactyla at a North Sea colony: evidence for a maximum foraging range. Marine Ecology Progress Series. 245: 239 – 247. Retrieved from https://www.researchgate.net/publication/250217818_Foraging_strategies_of_the_Black-legged_Kittiwake_Rissa_tridactyla_at_a_North_Sea_colony_evidence_for_a_maximum_foraging_range. Accessed on 11 June 2021

Eastham, C. 2014. The use of breeding seabird foraging ranges for assessing impacts to Special Protection Areas (SPAs) from wave and tidal renewable energy proposals. Proceedings of the 2nd International Conference on Environmental Interactions of Marine Renewable Energy Technologies (EIMR2014), 28 April – 02 May 2014, Stornoway, Isle of Lewis, Outer Hebrides, Scotland. Retrieved from https://tethys.pnnl.gov/sites/default/files/attachments/EIMR2014_942_Eastham.pdf. Accessed on 11 June 2021

European Court of Justice C-127/02. 2004. Directive 92/43/EEC- Conservation of natural habitats and of wild flora and fauna – Concept of "plan" or "project" – Assessment of the implications of certain plans or projects for the protected site. Cas C-127/02. Waddenvereniging and Vogelsbeschermingvereniging

Government, U. K. (1994). Conservation (Natural Habitats, &c.) Regulations 1994. Retrieved from https://www.legislation.gov.uk/uksi/1994/2716/regulation/1/made. Accessed on 14 May 2021

Henry, E., & Hammill, M.O. 2001. Impact of small boats on the haul out activity of harbour seals (Phoca vitulina) in Métis Bay, St Lawrence Estuary, Québec, Canada. Aquatic Mammals. 27(2): 140– 148

JNCC. 2021a. Trotternish Ridge Designated Special Area of Conservation (SAC). Retrieved from https://sac.jncc.gov.uk/site/UK0012863. Accessed on 14 May 2021

JNCC. 2021b. Sligachan Peatlands Designated Special Area of Conservation (SAC). Retrieved from https://sac.jncc.gov.uk/site/UK0019798. Accessed on 14 May 2021

JNCC. 2021c. Inverasdale Peatlands Designated Special Area of Conservation (SAC). Retrieved from https://sac.jncc.gov.uk/site/UK0019794. Accessed on 14 May 2021

McConnell, B.J., Fedak, M.A., Lovell, P., & Hammond, P.S. 1999. Movements and foraging areas of grey seals in the North Sea. Journal of Applied Ecology. 36(4):573-590. Retrieved from Movements and foraging areas of grey seals in the North Sea - Mcconnell - 1999 - Journal of Applied Ecology - Wiley Online Library. Accessed on 24 June 2021

NatureScot. 2016. Assessing Connectivity with Special Protection Areas (SPAs). Guidance. Version 3- June 2016. Retrieved from https://www.nature.scot/sites/default/files/2018-08/Assessing%20connectivity%20with%20special%20protection%20areas.pdf#:~:text=Goshawk%20%20%20Core%20range%20of%203km%2C%20with,to%2020km%2C%20and%20maximum%20recorded%20distance%20of%2028km. Accessed on 11 June 2021

NatureScot. 2021a. Habitats Regulations Appraisal (HRA). Retrieved from https://www.nature.scot/professional-advice/planning-and-development/environmental-assessment/habitats-regulations-appraisal-hra. Accessed on 14 May 2021

NatureScot. 2021b. Habitats Regulations Appraisal (HRA): likely significant effects. Retrieved from https://www.nature.scot/professional-advice/planning-and-development/environmental-assessment/habitats-regulations-appraisal-hra/habitats-regulations-appraisal-hra-likely. Accessed on 14 May 2021

SCOS. 2018. Scientific Advice on Matters Related to the Management of Seal Populations: 2018. Retrieved from http://www.smru.st-andrews.ac.uk/files/2019/05/SCOS-2018.pdf. Accessed on 11 June 2021

Strong, P., & Morris, S.R. 2010. Grey seal (*Halichoerus grypus*) disturbance, ecotourism and the Pembrokeshire Marine Code around Ramsey Island. J. Ecotourism. 9(2): 117–132

Thompson, P.M., Mackay, A., Tollit, J.T., Enderby, S., & Hammond, P.S. 1998. The influence of body size and sex on the characteristics of harbour seal foraging trips. Canadian Journal of Zoology. 76: 1044-1053. Retrieved from https://www.abdn.ac.uk/lighthouse/documents/pdf/Thompson-etalCJZ1998.pdf#:~:text=of%20radio-tagged%20harbour%20seals%20%28Phoca%20vitulina%29%20from%20Scotland.,km%29%2C%20but%20both%20were%20significantly%20shorter%20for%20females. Accessed on 14 May 2021

Todd, V.L.G., Todd, I.B., Gardiner, J.C., Morrin, E.C.N., MacPherson, N.A., DiMarzio, N.A., & Thompson, F. 2015. A review of impacts of marine dredging activities on marine mammals. ICES Journal of Marine Science. 72(2): 328-340. Retrieved from https://academic.oup.com/icesjms/article/72/2/328/676320. Accessed on 11 June 2021

Van Alsenoy, V., Bernard, P., & Van Grieken, R. 1993. Elemental concentrations and heavy metal pollution in sediments and suspended matter from the Belgian North Sea and the Scheldt estuary (Vol. 133). Science of The Total Environment. Retrieved from

https://www.sciencedirect.com/science/article/abs/pii/004896979390119Q. Accessed on 14 May 2021

Wilson, R.P., Liebsch, N., Gomez-Laich, A. Kay, W.P., Bone, A. Hobson, V.J., & Siebert, U. 2015. Options for modulating intra-specific competition in colonial pinnipeds : the case of harbour seals (Phoca vitulina) in the Wadden Sea. PeerJ 4, e957. Retrieved from https://peerj.com/articles/957.pdf. Accessed on 14 May 2021

Wilson, S., O'Malley, D., Cassidy, D., & Clarke, D. 2011. Surveying the seals of Carlingford Lough –a preliminary study 2008–11. Report to the Loughs Agency (N.Ireland), December 2011

Wisniewska, D.M., Johnson, M., Teilmann, J., Rojano-Donate, L., Shearer, J., Sveegaard, S., Miller, L.A., Siebert, U. & Madsen, P.T. 2016. Ultra-High Foraging Rates of Harbour Porpoises Make Them Vulnerable to Anthropogenic Disturbance. Current Biology. 26(11): 1441 – 1446. Retrieved from https://www.sciencedirect.com/science/article/pii/S0960982216303141#:~:text=The%20harbor%20porpoise%20%28Phocoena%20phocoena%29%2C%20the%20smallest%20cetacean,more%20frequently%2C%20and%20has%20a%20shorter%20lifespan%20. Accessed on 11 June 2021

7 Glossary

Acronym	Definition
AA	Appropriate Assessment
E	East
EIAR	Environmental Impact Assessment Report
HRA	Habitats Regulations Appraisal
JNCC	Joint Nature Conservation Committee
km	Kilometre
LSE	Likely Significant Effects
NE	Northeast
NNE	North Northeast
NNW	North Nortwest
S	South
SAC	Special Areas of Conservation
SCH	Staffin Community Harbour
SCOS	Special Committee on Seals
SE	Southeast
SPA	Special Protections Areas
SSW	South southwest
SW	Southwest
W	West
W	West
WNW	West Northwest
WSW	West Southwest

Appendix H.1: Benthic Ecology Habitat Assessment Report

Ocean Ecology

Marine Surveys, Analysis & Consultancy

Staffin Harbour Development Benthic Ecology Habitat Assessment Report

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Details

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Updates

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List of Abbreviations

BIIGLE	Bio-Image Indexing and Graphical Labelling Environment
BSH	Broad Scale Habitats
DEM	Digital Elevation Model
EIAR	Environmental Impact Assessment Report
EUNIS	European Nature Information System
GPS	Global Positioning System
GSD	Ground-Sampling Distance
JNCC	Joint Nature Conservation Committee
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
OEL	Ocean Ecology Limited
PMF	Priority Marine Features
SAC	Special Area of Conservation
UAV	Unmanned Aerial Vehicle

1. Introduction

1.1. Overview

Affric Limited commissioned Ocean Ecology Limited (OEL) to conduct a benthic habitat assessment to inform the drafting of an Environmental Impact Assessment Report (EIAR) for the proposed Staffin Community Harbour (SCH) development which involves the building of a new breakwater, upgrade the existing slipway and installation of pontoons. A benthic dive survey was undertaken by Atlantic Diving Services and involved the collection of video footage along 5 transects using a diver and camera spanning the area to the west of the planned development. The video footage underwent detailed analysis by OEL to provide an understanding of the epibiotic communities present with specific regard to any Priority Marine Features (PMFs) or habitats of interest such as kelp and maerl. Additionally, an Unmanned Aerial Vehicle (UAV) survey was conducted by Tracks Ecology Ltd at a later stage to extend further to the east the area covered in the earlier survey and obtain a more refined assessment of the main benthic habitats and PMFs present in the area (Figure 1 and Figure 2). The UAV imagery underwent detailed analysis by OEL to provide a full coverage habitat map of the Staffin harbour survey area as a whole. This habitat assessment report presents the results of both surveys.

1.2. Priority Marine Features

Nature Scot have identified a number of benthic habitats and marine species as PMFs (Saunders et al. 2011). Several of these important and sensitive habitats are known to occur around the West coast of Scotland (Fuller 1999, NatureScot 2021) and have the potential to occur within or near the survey area.

To note that the Staffin Harbour survey area lies within the boundaries of the Inner Hebrides and the Minches Special Area of Conservation (SAC) designated to protect harbour porpoises (*Phocoena phocoena*) as per Annex II of the Habitat Directive (The Council Directive 92/43/EEC). However, no benthic features are protected under this designation and therefore it was not part of this assessment.

1.2.1. Kelp and Seaweed Communities on Sublittoral Sediment

Shallow sublittoral sediments which support seaweed communities typically include the sugar kelp *Saccharina latissima*, the bootlace weed *Chorda filum* and various red and brown seaweeds, particularly filamentous types. A diverse range of fauna may be associated with these kelp and seaweed dominated habitats such as burrowing polychaete worms and bivalves, scavenging hermit crabs, crabs, starfish, fish and grazing top shells.

These habitats are generally found in shallow water (max. 20 m depth), on a wide variety of substrates (muddy sands and gravels through to cobbles and boulders) and in various environmental conditions. The generally sheltered nature of these habitats enables seaweeds to

grow on shells and small stones which lie on the sediment surface; some communities develop as loose-lying mats on the sediment surface.

1.2.2. Kelp Beds

Beds of the kelp *Laminaria hyperborea* form as forests and parks in rocky coastal areas, under a variety of wave and tidal conditions. The kelp provides a canopy under which a wide range of animals and other seaweeds thrive. A rich diversity of red seaweeds grows among the kelp and on the kelp stipes, while depending on conditions, sea mats and sea firs may colonise the fronds. The rocks below the kelp are often encrusted with coralline algae or support cushion forming fauna, such as sea anemones, sponges and sea squirts. Small crustaceans and worms live among the kelp holdfasts, while sea urchins and sea snails graze on the seaweeds, and fish find shelter from predators among the fronds.

Kelp beds occur in shallow waters (to a maximum of 20-30m), on bedrock and boulders in a range of wave exposure regimes and tidal conditions.

1.2.3. Maerl Beds

Maerl is a collective term for several species of red seaweed, with hard, chalky skeletons that grow as unattached rounded nodules or short, branched shapes on the seabed. As a result, maerl can form large beds, where layers of dead maerl build up with a thin layer of pink, living maerl on the top. These beds are a UK BAP habitat as they form an important habitat for many different types of marine life, which live amongst or are attached to the surface of maerl, or burrow in the coarse gravel of dead maerl beneath the top living layer. Maerl beds can be of importance to sustainable fisheries, providing nursery grounds for commercial species of fish and shellfish.

Due to the fragility of maerl, the beds are easily damaged and have probably declined substantially in some areas. Pressures on maerl beds include scallop dredging, bottom trawling, aquaculture, and pollution. Maerl beds are very slow to develop and are unlikely to return if removed or lost..

1.2.4. *Zostera* Beds

Seagrasses (also known as eelgrass) are marine flowering plants found in shallow coastal areas down to 10 m, often growing in dense beds or meadows. The plants can be annual or perennial and stabilise the sediment, creating productive habitats that provide shelter and food for a wide variety of plants and animals (including other species of conservation importance and commercially valued fish species), as well as being important for carbon sequestration.

A *Zostera* 'bed' is generally classed as having plant densities that provide at least 5% cover (OSPAR 2009). Typically, *Zostera* plant densities provide greater than 30% cover and in favourable conditions, extensive beds may form with up to 95% cover (Lancaster et al. 2014). A minimum area of 5 m x 5 m with at least 5% cover of seagrass is required to qualify as a seagrass bed.

Zostera beds are usually found in sands and muds from the upper shore down to 10 m, in areas at least moderately sheltered from wave action such as sea lochs, inlets, bays, sounds, channels and lagoons. *Z. marina* is predominantly subtidal, whilst the narrow-leaved variant, *Z. marina var. angustifolia*, can occur in the shallow subtidal and intertidally on the mid to lower shore.

2. Methods

2.1. Survey Design

The benthic dive survey covered the western portion of the proposed Staffin harbour new design from Mean Low Water Springs (MLWS) to Mean High Water Springs (MHWS). All seabed imagery was obtained on the 4th of March 2021 across all 5 transects (Figure 1). Transect coordinates are presented in Appendix I. The UAV survey was undertaken on the 6th of July 2021 to collect high resolution imagery of the eastern reaches of the proposed Staffin harbour survey area at low water (Figure 2).

2.2. Field Methods

2.2.1. Diver Video Transect Sampling

A concrete weight was dropped at the offshore locations T2, T3, T7, T6 and a leaded line with marker tags every 5 m was laid back to shore from the block. For T9 to T10 the line was attached to the slipway and fed out to a concrete weight at T10. Transect T2 to T1 and T3 to T4 were shorter than planned due to a NE swell pushing the diver towards the rock shelf and making it unsafe to proceed any further. All dives were started on the offshore transect points except for T9-T10 which was started inshore at T9. Divers used a hand-held rig containing a Go Pro 7.

2.2.2. UAV Mapping

The UAV mapping was by Tracks Ecology Ltd in accordance with the Civil Aviation Authority (CAA) regulations. Tracks Ecology Ltd holds a Certificate of Competency for flights within the A2 subcategory and a General Visual Line of Sight Certificate. The UAV used was a DJI Phantom 4 Professional. Two flights were necessary to adequately cover the survey area to the appropriate resolution and were pre-planned using the Pix4DmapperPro software to achieve an orthomosaic Ground-Sampling Distance (GSD) of 1-5 cm/px. Appendix II includes the full UAV survey report.

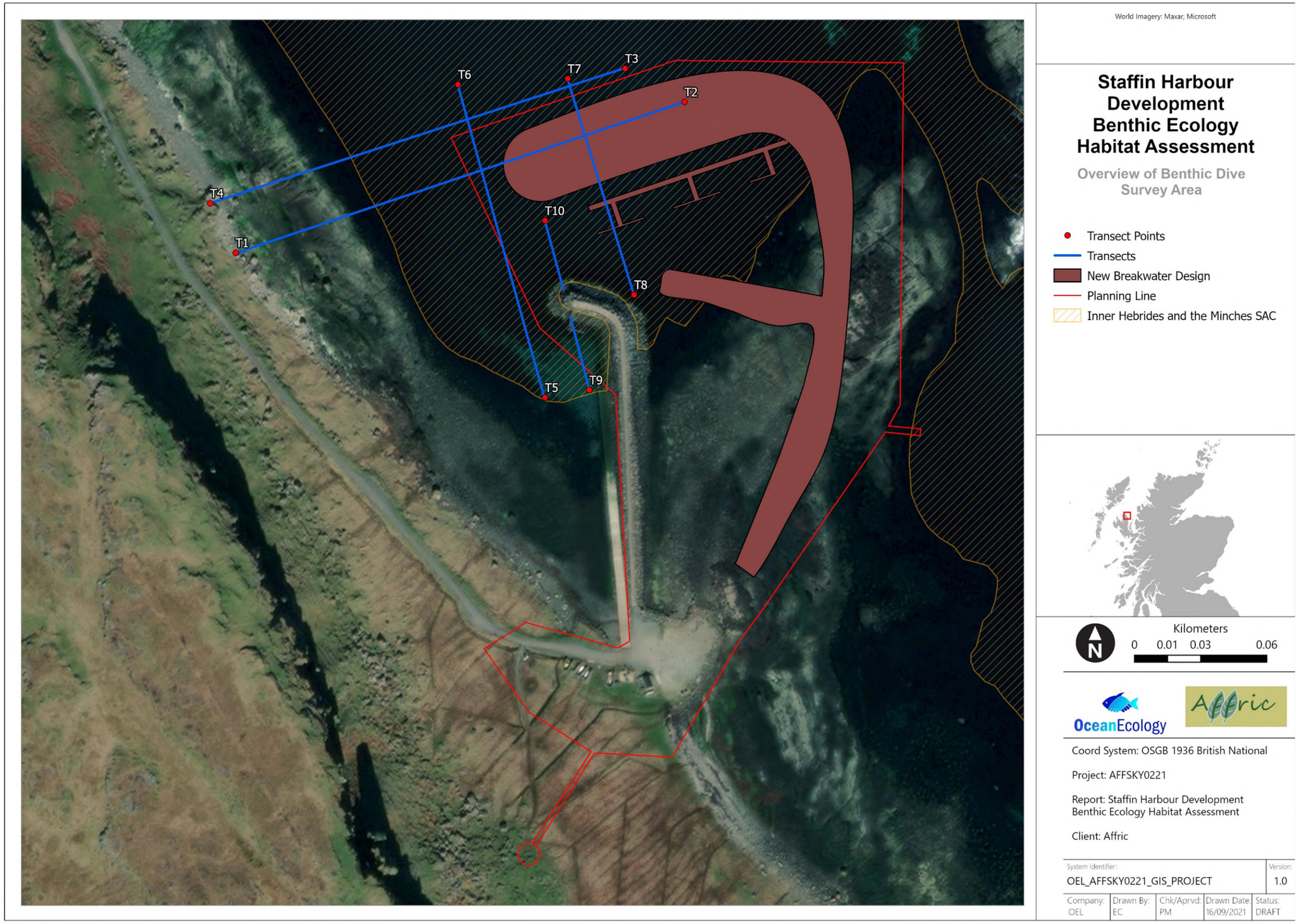


Figure 1 Overview of the Staffin Harbour survey area covered by the video footage collected across 5 transects and new slipway and breakwater designs.

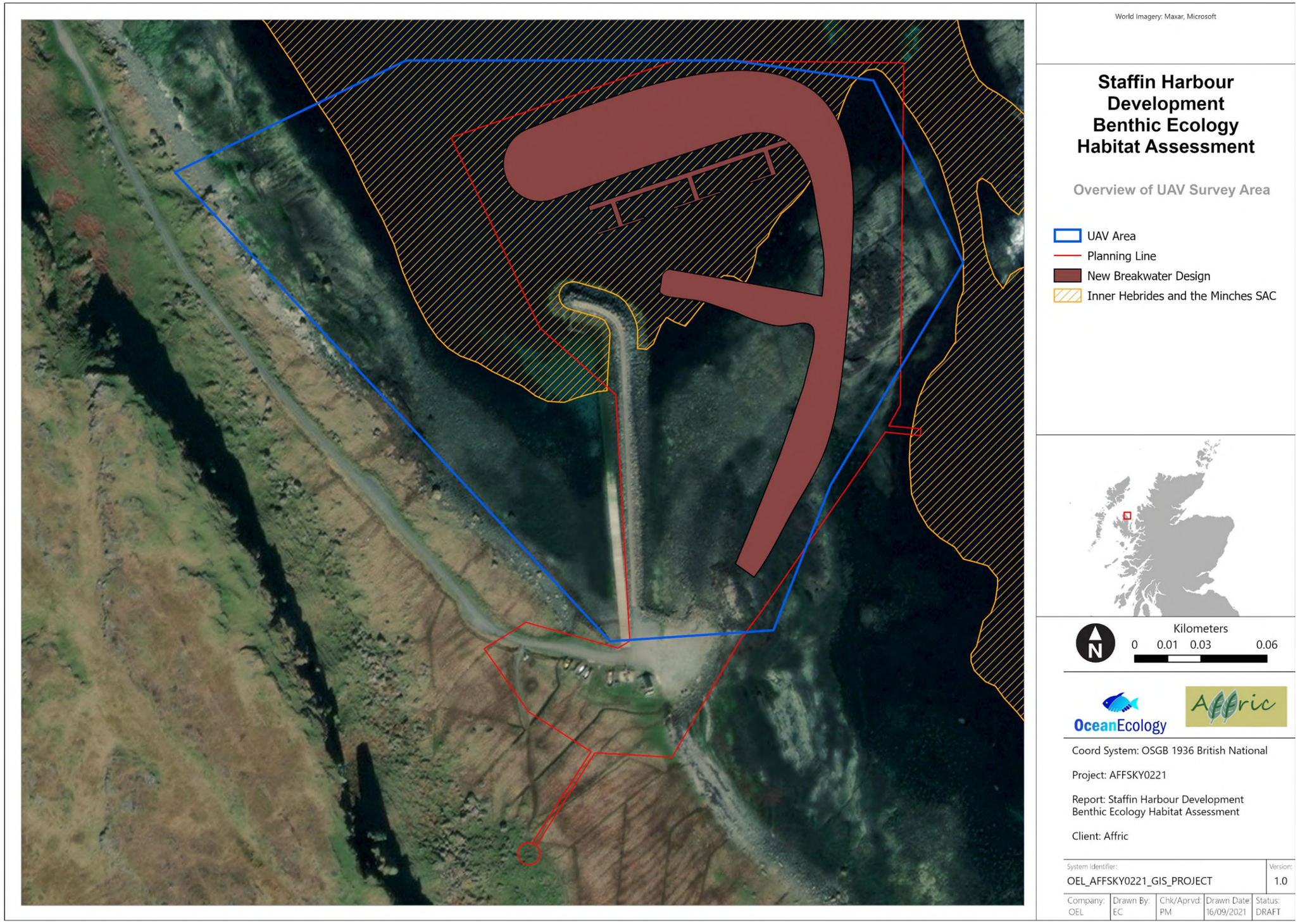


Figure 2 Overview of the Staffin Harbour survey area covered by the UAV flight and new slipway and breakwater designs.

2.3. Analysis

2.3.1. Seabed Imagery Analysis

All seabed video footage analysis was undertaken in consideration of the Joint Nature Conservation Committee (JNCC) epibiota remote monitoring interpretation guidelines (Turner et al., 2016) and biotopes were assigned in line with the most recent JNCC guidance on assigning benthic biotopes (Parry 2019).

Each video tow was scanned initially by eye rapidly (at approximately 4 x normal speed) to identify the main habitats and segment the video tow into sections characterised by different habitats (Figure 3).

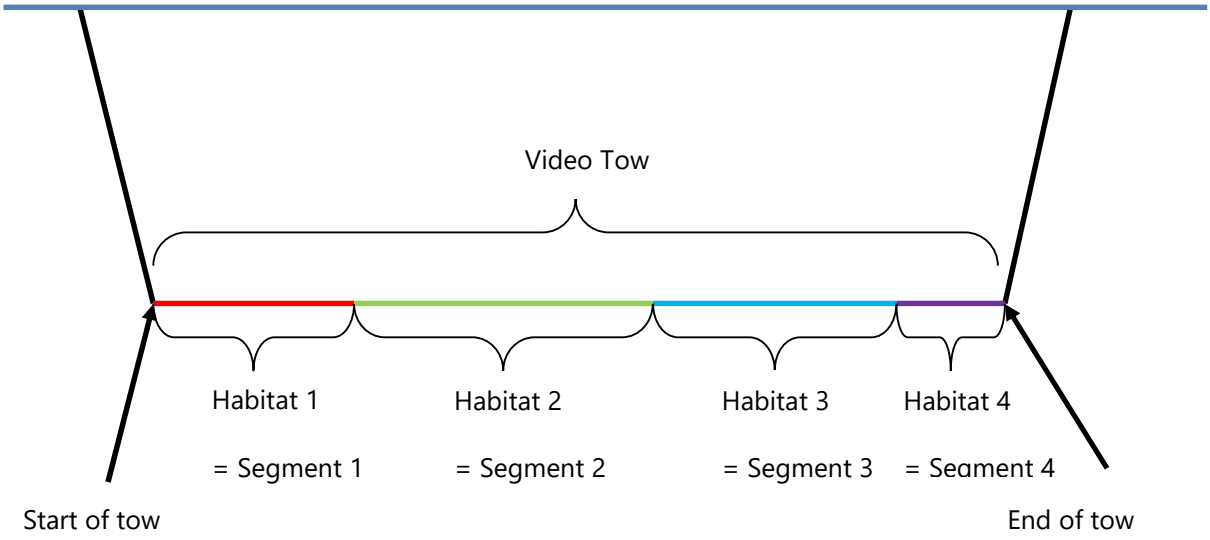


Figure 3 Simplified illustration of method for segmenting seabed video tows based on changes in habitat. Adapted from Marine Recorder Briefing Note, JNCC.

All seabed video analysis was undertaken using the Bio-Image Indexing and Graphical Labelling Environment (BIIGLE[1]) annotation platform (Langenkämper et al. 2017). BIIGLE is a cloud-based image annotation platform which allows for increased accuracy, repeatability, and improved quality assurance in the analysis of both video and still images data. A label tree specific for the project was created to include a collection of labels that related to each PMF and broad scale habitat (BSH). Under each PMF type, labels could also be assigned for specific categories required to determine whether the PMF was present as detailed in Appendix III. Analysis of video footage was undertaken at "Tier 1" level which consisted of assigning labels that referred to each video segment providing appropriate metadata for the whole video footage at each transect.

[1] https://www.biigle.de/

2.3.2. UAV Imagery Analysis

Following initial screening to remove any erroneous images, all images collected during the UAV mapping flights were 'stitched' together to generate orthomosaic and Digital Elevation Model (DEM) outputs for the intertidal survey area using Pix4DmapperPro software.

2.3.3. Habitat Mapping

Mapping of PMFs and habitats present across the proposed Staffin harbour survey area was undertaken in ESRI ArcPro Version 2.7.1. This involved plotting the BIIGLE outputs as well as UAV imagery to broadly estimate habitat boundaries. Confidence scores were assigned to all polygons to give an indication of their accuracy. Values ranged from 1 (only once source of information was available) to 2 (both types of imagery – seabed and UAV- were available).

2.3.4. EUNIS Classification Mapping

EUNIS habitats and biotopes were identified in line with JNCC guidance on assigning benthic biotopes (Parry 2019) to allow the communities to be mapped and allow comparison with existing data. All habitat / biotope determination was undertaken through consideration of the following:

- Existing habitat mapping (derived from EMODnet)
- UAV imagery interpretation
- General site imagery

2.3.5. Features of Interest

After assigning EUNIS habitats and biotopes to the survey area based on seabed video footage and UAV imagery analyses, an assessment of the presence of PMFs was carried out, and where appropriate, the extent of these features was calculated.

Most of the intertidal survey area was assigned a rocky biotope based on the UAV imagery. As none of rocky biotope identified is protected under the designation of the Inner Hebrides and the Minches SAC, which overlaps the intertidal area surveyed, no Annex I assessment was undertaken. Under JNCC guidelines, where EUNIS habitats or biotopes are not protected under European designated sites, they do not qualify as Annex I features and are not required to be assessed as Annex I habitats (JNCC 2015).

3. Results

3.1. Seabed Video Footage

A total of 5 transects were sampled across the survey area which resulted in over 74 minutes of video footage and 208 corresponding stills. Full details of the analysis of the imagery can be found in Appendix IV.

3.1.1. EUNIS Habitats

Five EUNIS habitats were observed across the survey area (Plate 1, Figure 4 and Figure 5). The most frequently observed were 'A3.214 - *Laminaria hyperborea* and foliose red seaweeds on moderately exposed infralittoral rock', and 'A5.52 - Kelp and seaweed communities on sublittoral sediment'. Patches of 'A5.521 - *Laminaria saccharina* and red seaweeds on infralittoral sediments' and 'A5.23 – Infralittoral fine sand' were also observed in the middle and in the southeaster reaches of the survey area, respectively. Additionally, a lens of coarse sediment representing EUNIS habitat 'A5.13 – Infralittoral coarse sediment' was observed within the area of fine sand.

Fauna across the survey area included echinoderms such as the starfish *Asteria rubens* and *Marthasterias glacialis* and the common sea urchin *Echinus esculentus* observed on hard substrates, and gastropods such as *Calliostoma zizyphinum* and *Gibbula* sp. attached to kelp and seaweeds. Other taxa observed across the survey area were sea anemones (*Sagartia* sp.), encrusting sponges and bryozoans, and crabs (*Cancer pagurus* and *Maja* sp.).

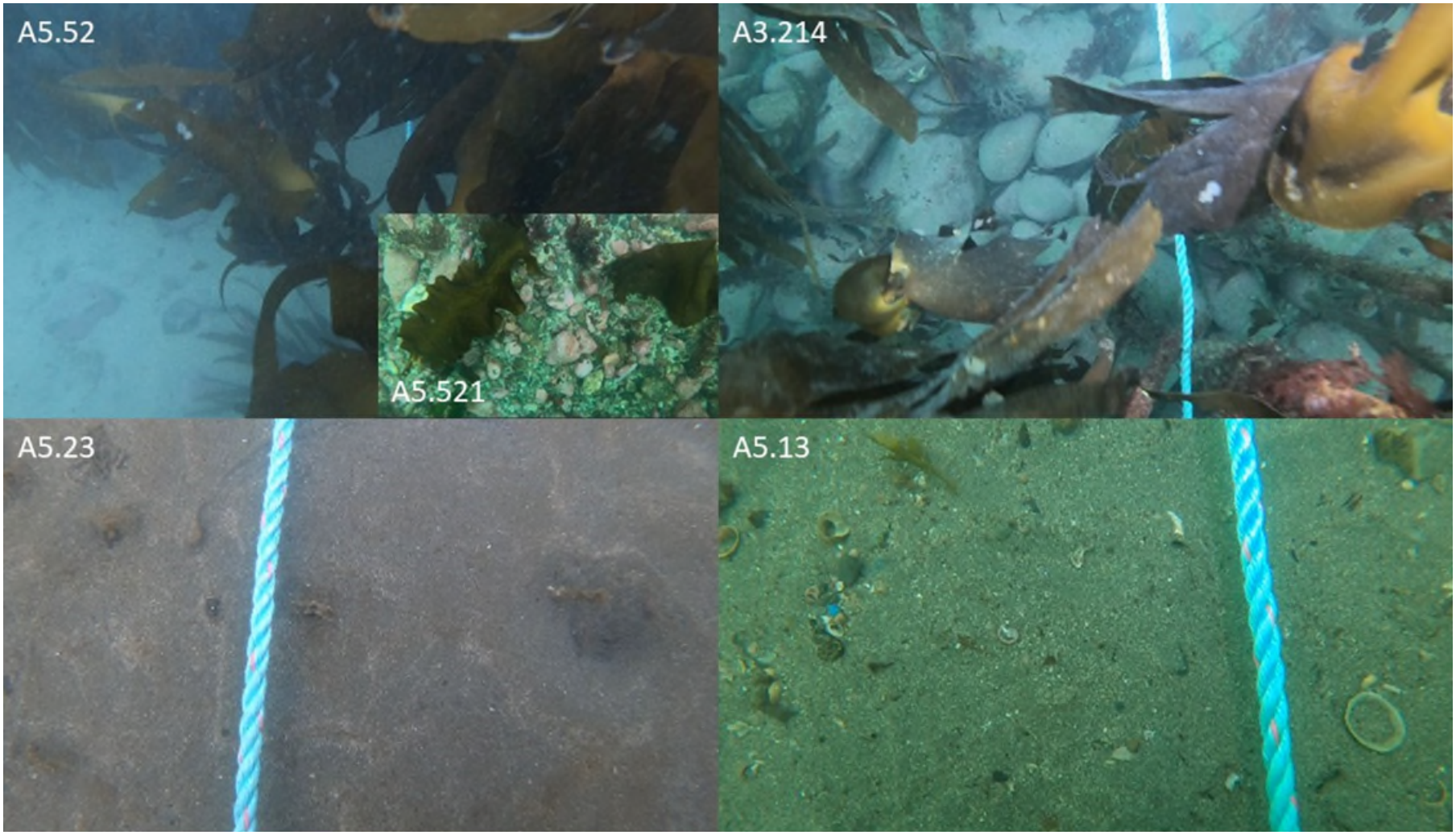
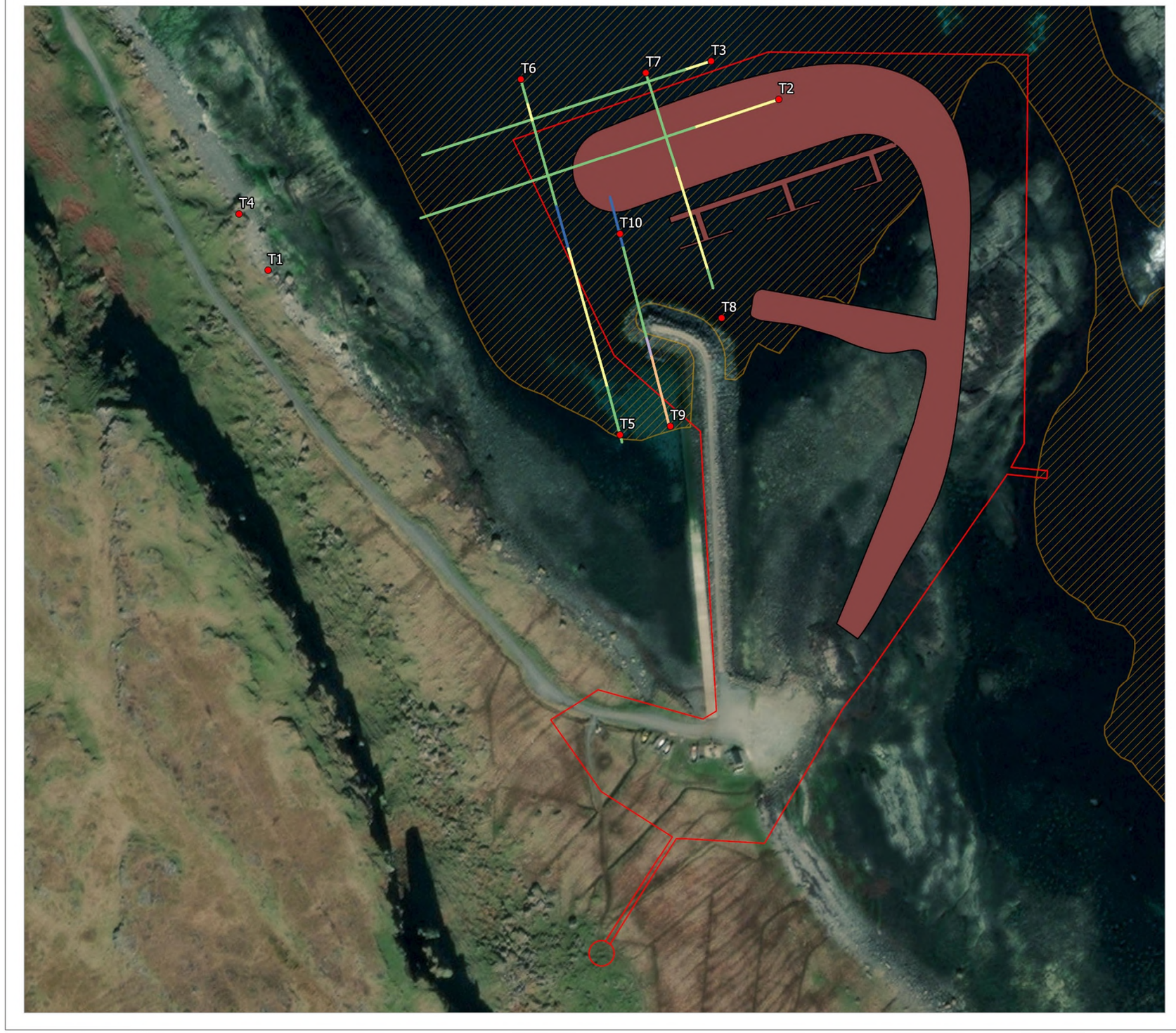


Plate 1 Examples of EUNIS habitats and biotopes observed across the survey area. 'A5.52 - Kelp and seaweed communities on sublittoral sediment, A5.521 - *Laminaria saccharina* and red seaweeds on infralittoral sediments, A3.214 - *Laminaria hyperborea* and foliose red seaweeds on moderately exposed infralittoral rock, and A5.23 – Infralittoral fine sand and A5.13 – Infralittoral coarse sediment.



World Imagery: Maxar, Microsoft

Staffin Harbour Development Benthic Ecology Habitat Assessment

Distribution of EUNIS Biotopes (seabed imagery)

Key

- Transect Points
- A3.214
- A5.13
- A5.23
- A5.52
- A5.521
- Planning Line
- Inner Hebrides and the Minches SAC
- New Breakwater Design

N

Kilometers

0 0.01 0.03 0.06

OceanEcology

Affric

Coord System: OSGB 1936 British National

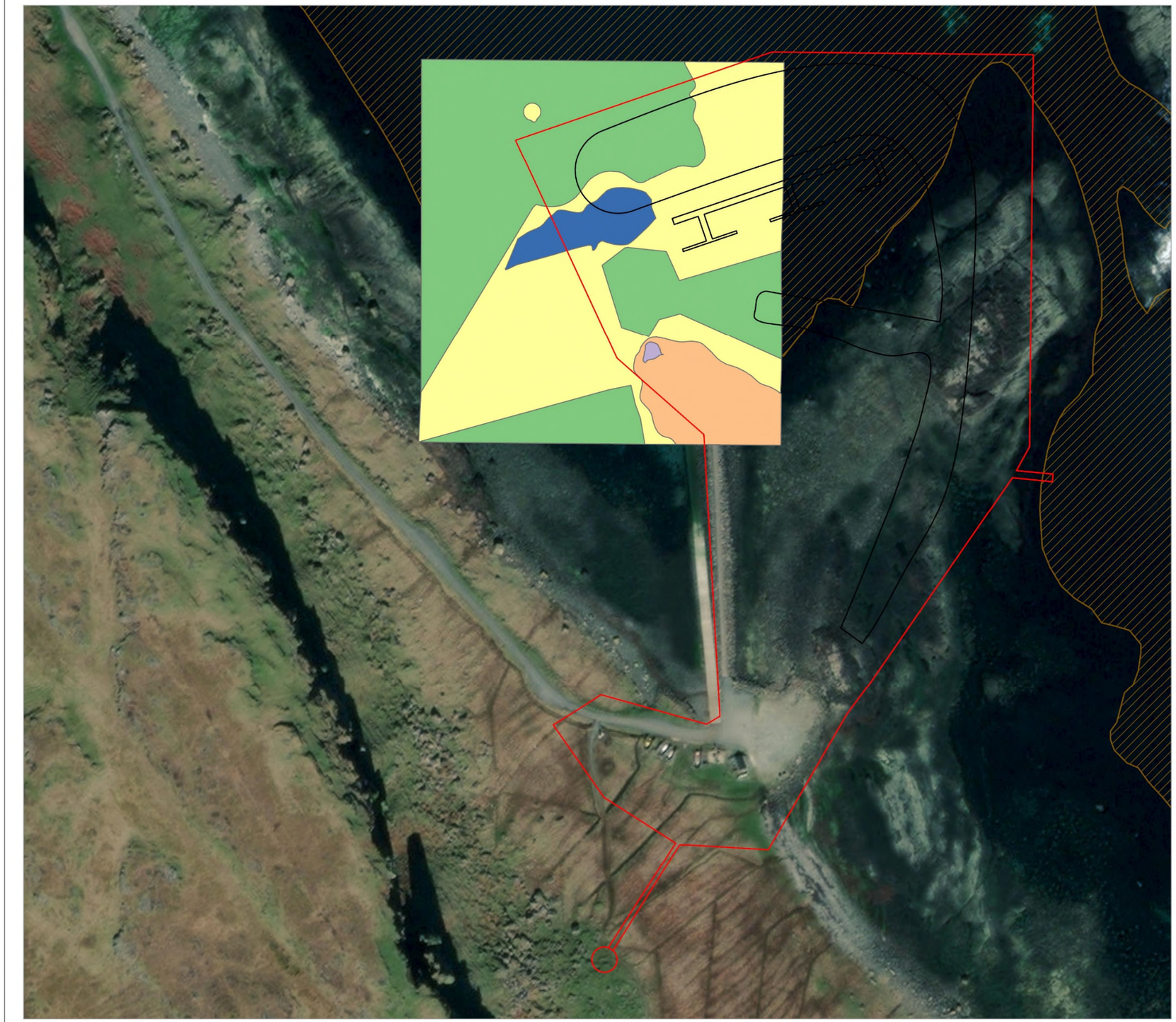
Project: AFFSKY0221

Report: Staffin Harbour Development Benthic Ecology Habitat Assessment

Client: Affric

System Identifier:				Version:
OEL_AFFSKY0221_GIS_PROJECT				1.0
Company: OEL	Drawn By: EC	Chk/Aprvd: PM	Drawn Date: 16/09/2021	Status: DRAFT

Figure 4 EUNIS classifications assigned to video footage along each of the transects sampled across the Staffin Harbour survey area.



World Imagery: Maxar, Microsoft

Staffin Harbour Development Benthic Ecology Habitat Assessment

EUNIS Biotopes (seabed imagery)

Key

- A3.214
- A5.13
- A5.23
- A5.52
- A5.521
- New Breakwater Design
- Planning Line
- Inner Hebrides and the Minches SAC

N

Kilometers

0 0.01 0.03 0.06

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Figure 5 Predicted EUNIS habitats/biotopes for the Staffin Harbour survey area based on video footage data.

3.2. UAV Survey

UAV mapping of the proposed Staffin harbour survey area was undertaken by Tracks Ecology over a 48-minute period around low water on the 6th of July 2021. Flight height was maintained at 70 m for all areas and weather conditions (e.g. wind / precipitation) remained favourable for data collection throughout. However, the detail of sub surface areas was sub-optimal due to the effect of the sea state with waves up to 0.5m.

The UAV survey successfully captured 308 high-resolution nadir images across an area of 93,000 m^2 to produce a high resolution orthomosaic model (GSD = 1.63 cm/px). To note that much of this area was open water and not included in the analysis.

3.2.1. Habitat / Biotope Mapping

There was a total of 16 unique EUNIS biotopes and biotope complexes (EUNIS level 4 or above) from the 10 BSH (EUNIS level 3) (Table 1) observed across the Staffin harbour survey area as mapped in Figure 6. The designation status of each is set out in Table 1 and discussed further in Section 3.3.

High to moderate energy rocky habitats (A1.1 and A1.2) were encountered in the upper and mid shore both east and west of the existing slipway including rocks dominated by barnacles, *Littorina* spp. (A1.1131 and A1.1133) and *Fucus serratus* (A1.1132) as well as areas dominated by barnacles and fucoids (A1.212 and A1.2141 and A1.2142). Rockpools were scattered across the survey area with both coralline and green algae present (A1.4111 and A1.421). The lower shore was characterised by a mosaic of rocks, from cobbles and boulders to exposed bedrock, covered in *L. hyperborea* (A3.213 and A3.214) and fucoids. A patch of sandy sediments (A5.2) was observed just west of the existing slipway giving way to kelp beds further to the west. The extreme lower shore was characterised by sediments supporting kelp and seaweed communities (A5.52).

All habitats supporting kelp were deemed to be representative of PMFs. Specifically, the PMF 'Kelp beds' covered a total extent of 13,017.07 m^2 (0.013 km^2) of the area surveyed, while the PMF 'Kelp and seaweed communities on sublittoral sediment' covered a total area of 25,876.63 m^2 (0.026 km^2) of the area surveyed. The EUNIS classification and PMFs mapping presented in Figure 6 is provided in GIS format as Appendix V.

Table 1 Key EUNIS classifications recorded across the Staffin harbour survey area

EUNIS BSH	EUNIS Code	EUNIS Description	Designation Status
A1.1	A1.1131	*Semibalanus balanoides*, *Patella vulgata* and *Littorina* spp. on exposed to moderately exposed or vertical sheltered eulittoral rock	None
	A1.1132	*Semibalanus balanoides*, *Fucus vesiculosus* and red seaweeds on exposed to moderately exposed eulittoral rock	
	A1.1133	*Semibalanus balanoide* and *Littorina* spp. on exposed to moderately exposed eulittoral boulders and cobbles	
A1.2	A1.2	Moderate energy littoral rock	None
	A1.212	*Fucus spiralis* on full salinity exposed to moderately exposed upper eulittoral rock	
	A1.2141	*Fucus serratus* and red seaweeds on moderately exposed lower eulittoral rock	
	A1.2142	*Fucus serratus* and under-boulder fauna on exposed to moderately exposed lower eulittoral boulders	
A1.4	A1.4111	Coralline crusts and *Corallina officinalis* in shallow eulittoral rockpools	None
	A1.421	Green seaweeds (*Enteromorpha* spp. and *Cladophora* spp.) in shallow upper shore rockpools	
A2.1	A2.11	Shingle (pebble) and gravel shores	None
	A2.111	Barren littoral shingle	
A3.2	A3.213	*Laminaria hyperborea* on tide-swept infralittoral mixed substrata	PMF – Kelp beds
	A3.214	*Laminaria hyperborea* and foliose red seaweeds on moderately exposed infralittoral rock	
A5.1	A5.13	Infralittoral coarse sediment	None
A5.2	A5.23	Infralittoral fine sand	None
A5.5	A5.52	Kelp and seaweed communities on sublittoral sediment	PMF - Kelp and seaweed communities on sublittoral sediment
B3.1	B3.11	Lichens or small green algae on supralittoral and littoral fringe rock	None
J4.5	J4.5	Hard-surfaced areas of ports	None

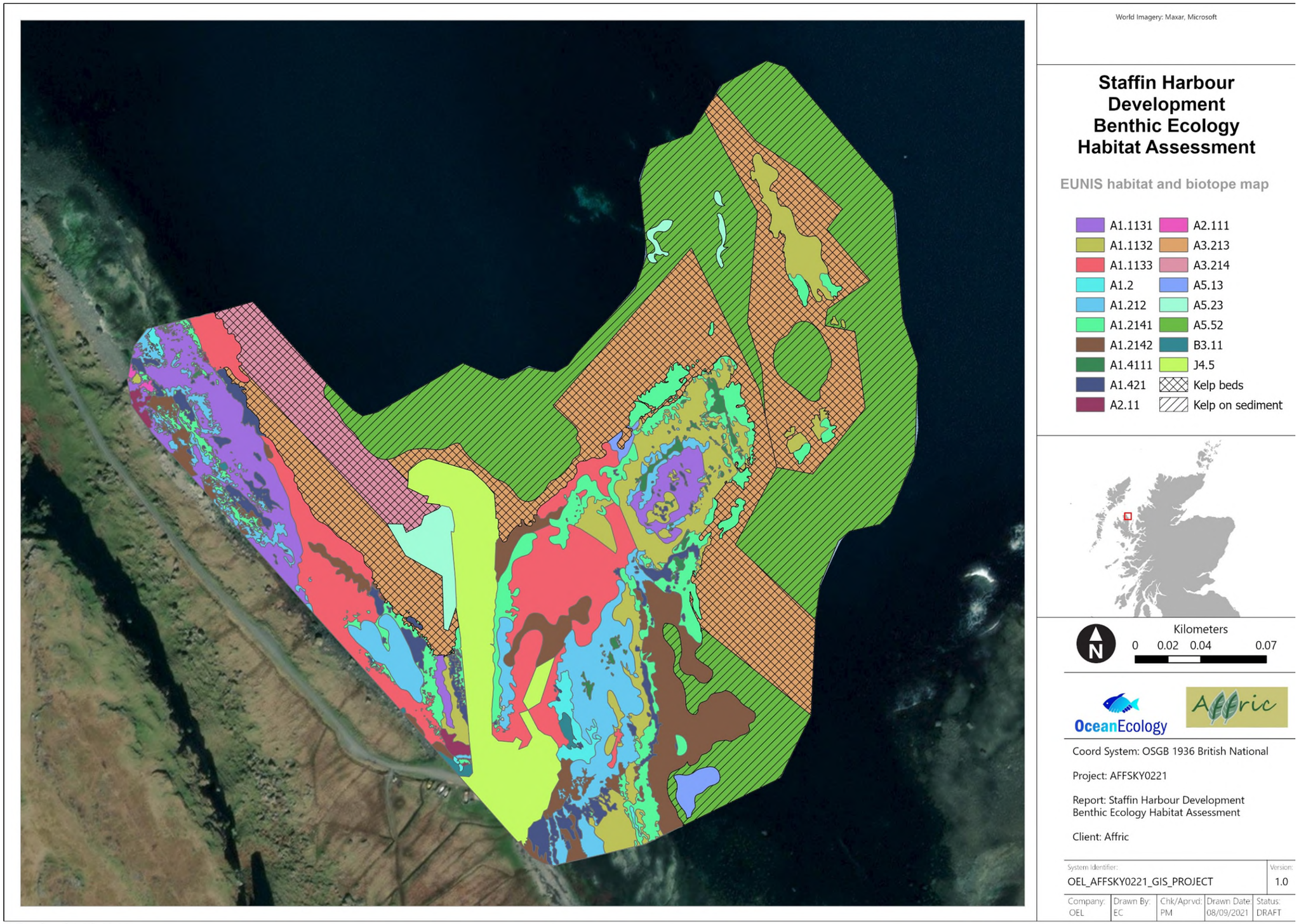

Figure 6 EUNIS habitats/biotopes for the Staffin Harbour survey area based on UAV imagery.

3.3. Priority Marine Features

3.3.1. Kelp and Seaweed Communities

Kelp and seaweed communities were observed across the survey area on both soft and hard substrates based on both seabed video footage and UAV imagery. Soft substrates were representative of the EUNIS biotopes 'A5.52 - Kelp and seaweed communities on sublittoral sediment[2]' and 'A5.521 - *Laminaria saccharina* and red seaweeds on infralittoral sediments[3]' (Figure 6 and Figure 7). Whilst hard substrates were representative of the EUNIS biotopes 'A3.213 - *Laminaria hyperborea* on tide-swept infralittoral mixed substrata'[4] and 'A3.214 - *Laminaria hyperborea* and foliose red seaweeds on moderately exposed infralittoral rock'[5].

Soft substrates were made up of coarse sediments comprising of boulders, cobbles, pebbles, and sand characterised by *Laminaria* and other seaweeds (A5.52) with a small patch in the mid of the survey area (based on video footage) dominated by *Saccharina latissima* and *Saccorhiza polyschides* highly encrusted by coralline algae (A5.521). This represents the PMF broad habitat 'Kelp and seaweed communities on sublittoral sediments'.

Hard substrates consisted of large cobbles and boulders colonised by *Laminaria* often heavily encrusted by coralline algae and with red seaweed present on kelp stipes. Occasionally *S. polyschides* was present. Video footage allowed to discriminate substantial variations in the height of *Laminaria* observed with new recruits present and some dislodged and free-floating individuals also noted. Along transect T9-T10, *Laminaria* was present on high relief rock and a small shallow rock outcrop dominated by *Fucus* was observed; however, its extent was not large enough (below the 5 m x 5 m threshold) to be characterised as a separate biotope (Parry 2019). This represents the PMF broad habitat 'Kelp beds' observed both in the video footage and UAV imagery.

Based on video footage, kelp and seaweed communities on sublittoral sediments covered an area of 8,711 m^2 (0.0087 km^2) within the area surveyed, while kelp beds on rock extended for 10,299 m^2 (0.010 km^2) of the surveyed area. UAV imagery allowed for the identification of the same habitats with kelp and seaweed communities on sublittoral sediments covering an area of 25,876.63 m^2 (0.026 km^2) and of kelp beds covering 13,017.07 m^2 (0.013 km^2).

3.3.2. Maerl and Zostera Beds

There were no observations of Maerl of seagrass beds across the survey area.

[2] Marine habitat classification of Britain and Northern Ireland code: SS.SMp.KSwSS
[3] Marine habitat classification of Britain and Northern Ireland code: SS.SMp.KSwSS.LsacR
[4] Marine habitat classification of Britain and Northern Ireland code: IR.MIR.KR.LhypTX
[5] Marine habitat classification of Britain and Northern Ireland code: IR.MIR.KR.Lhyp

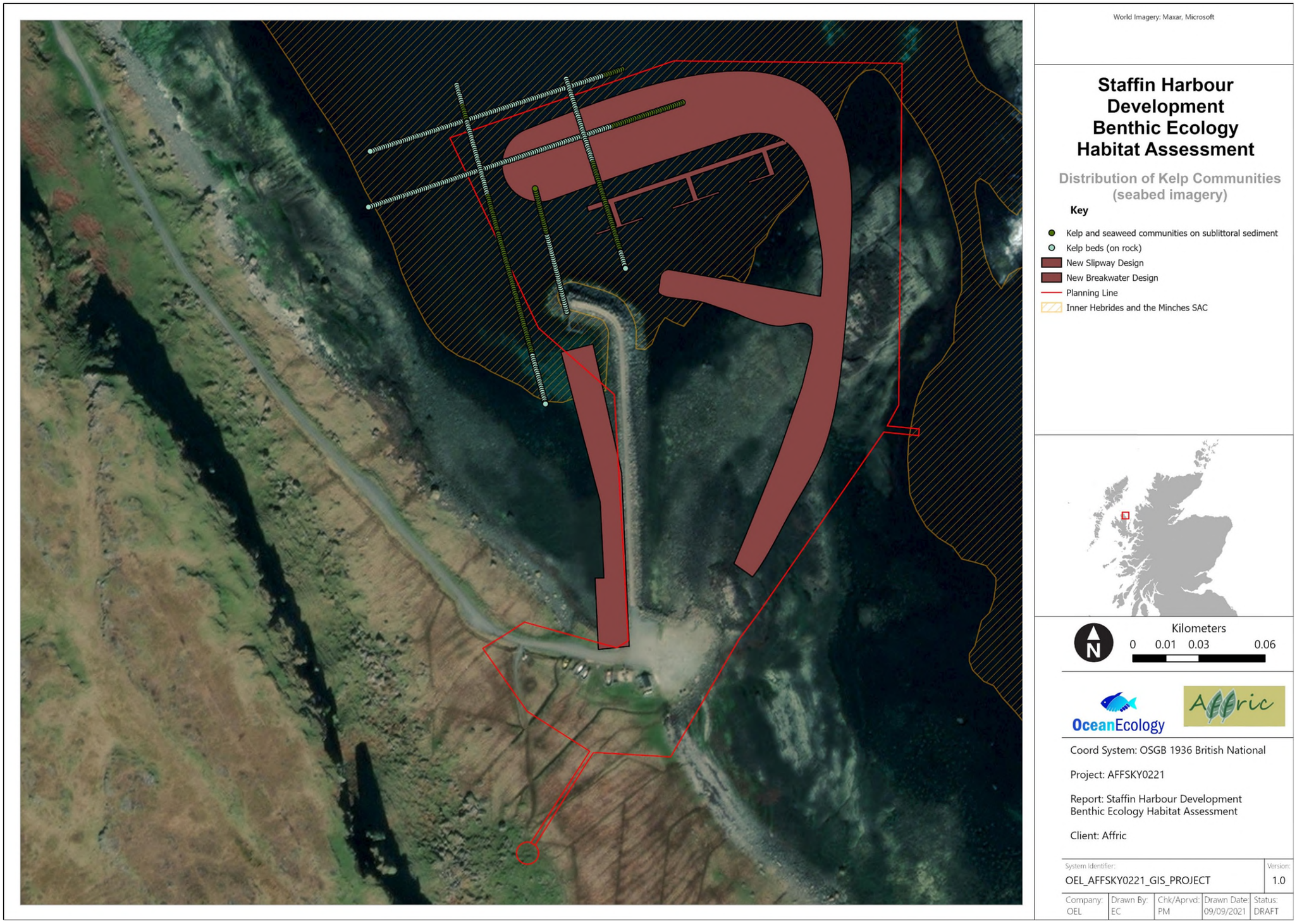

Figure 7 Distribution of kelp and seaweed communities and kelp beds observed in videos along each of the transects sampled across the Staffin Harbour survey area.

4. Discussion

OEL was commissioned by Affric Limited Environmental to undertake the analysis of seabed and UAV imagery collected during a benthic dive survey conducted in March 2021 and a UAV survey conducted in July 2021 to assess for the presence of and map any PMFs across the survey area. This involved analysis of seabed video footage collected along five transects spanning the western reaches of the proposed survey area. All images were analysed using the BIIGLE annotation platform by experienced marine ecologists. This ensured the assessment of the video footage against the various PMFs was undertaken in an auditable and transparent manner that can easily be reviewed and validated by regulatory bodies (and others) if required. Additionally, UAV imagery was also collected across the survey area, extending further to the east compared to the area covered by the seabed imagery, to expand on the findings based on the video footage and better assess the presence of PMFs in and around Staffin harbour.

The survey area mostly comprised rocky habitats in the upper to mid shore and kelp dominated habitats in the mid to lower shore. Information obtained from the video footage was used to produce a habitat map (Figure 5) of the survey area. Due to the lack of detailed bathymetric data, this was primarily undertaken by interpolating between the survey transects. As a result, boundaries have been estimated and all polygons were attributed the lowest level of confidence (1). Conversely, information obtained from the UAV imagery was used to produce the habitat and biotope map in Figure 6 where polygons were assigned a confidence level of 1 where only UAV imagery was available to define boundaries and of 2 in the few instances where UAV imagery and seabed video footage overlapped. To note that UAV imagery of the sub surface area was of a lower quality compared to the rest of the imagery due to the sea state on the day of data collection. Given the wider extension of the area covered by the UAV mapping, Figure 6 includes a wider area than in Figure 5, however seabed imagery provided a better understanding of the flora and fauna present across the survey area as a whole.

The PMFs "Kelp and Seaweed Communities on Sublittoral Sediment" and "Kelp bed" were observed across the survey area covering a combined area of 57,904 m^2 (0.058 km^2). To note that this is likely to be an overestimation as it does not consider the overlapping areas of video footage and UAV imagery. However, the habitat maps in Figure 6 and Figure 7 give a representative indication of the distribution of these PMFs across the survey area. This is consistent with these two PMFs being particularly widespread along the west coast of Scotland and around the Hebrides (Tyler-Walters et al. 2016).

There was no evidence of the presence of maerl or seagrass beds across the survey area. To note that coralline algae were frequently observed encrusting kelp and hard substrates across the survey area however, none was representative of maerl bed habitat.

5. References

Fuller I (1999) Kelp Forests - Scotland's living landscapes (SNH Publication).

Lancaster J, McCallum S, A.C. L, Taylor E, A. C, Pomfret J (2014) Development of detailed ecological guidance to support the application of the Scottish MPA selection guidelines in Scotland's seas. Scottish Nat Herit Comm Rep No491 Deep Sponge Communities – Suppl Doc.

Langenkämper D, Zurowietz M, Schoening T, Nattkemper TW (2017) BIIGLE 2.0 - Browsing and Annotating Large Marine Image Collections. Front Mar Sci 4:83.

Long D (2006) BGS detailed explanation of seabed sediment modified folk classification. Folk.

NatureScot (2021) Marine habitats | NatureScot

OSPAR (2009) Background Document for Zostera beds, Seagrass beds. Biodivers Ser:39.

Parry ME V (2019) Guidance on Assigning Benthic Biotopes using EUNIS or the Marine Habitat Classification of Britain and Ireland (Revised 2019).

Saunders G, Bedford GS, Trendall JR, Sotheran I (2011) Guidance on survey and monitoring in relation to marine renewables deployments in Scotland. Volume 5. Benthic Habitats. Unpublished draft report to Scottish Natural Heritage and Marine Scotland.

Turner JA, Hitchin R, Verling E, van Rein H, Hitching R, Verling E, van Rein H (2016) Epibiota remote monitoring from digital imagery: Interpretation guidelines.

Tyler-Walters H, James B, Carruthers M, Wilding C, Durkin O, Lacey C, Philpott E, Adams L, Chaniotis PD, Wilkes PTV, Seeley R, Neilly M, Dargie J, Crawford-Avis OT (2016) Descriptions of Scottish Priority Marine Features (PMFs). Scottish Nat Herit Comm:140.

Appendix H.2: UAV Survey Report

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Consulting Civil Engineers

DAL
DALGLEISH
ASSOCIATES
LIMITED

VERSION 1.1

SEPTEMBER 8, 2021

TECHNICAL REPORT

STAFFIN HARBOUR DEVELOPMENT

AERIAL MAPPING

REPORT REF: 21/011/AFF/R04

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Version	Date	Issue Notes
1.1	8th September 2021	Draft for Client review

CONTENTS

1 INTRODUCTION

1.1 TERMS OF REFERENCE

Tracks Ecology was commissioned by Affric Limited to undertake an aerial mapping exercise (using unmanned aerial vehicles (UAVs)) involving the acquisition and processing of visible colour (RGB) digital photography covering the foreshore of the Staffin Harbour covering the existing infrastructure and proposed development area. Staffin Harbour is located near to Staffin at the northern end of the Isle of Skye with a Site centre of NG 495682.

The purpose of the survey was to document assess the foreshore structure and habitat along with mapping the existing infrastructure. The focus of the mapping was in relation to the production of a high resolution orthomosaic. This was achieved through acquiring contemporary aerial imagery to allow the production of detailed RGB orthomosaic, point clouds and elevation models of the area.

The data acquisition was on 6th July 2021 with the low tide at the nearest recording station (Loch Snizort - Uig Bay) on this date identified as at 11:31 (1.63m). To allow maximum view of the intertidal zone the Site was subject to data collection between 11:07 and 11:42.

1.2 OBJECTIVES OF STUDY

- Digital capture of RGB aerial photography with ground sampling distance (GSD) of approximately 1.5cm.
- Production of RGB orthomosaics of a quality suitable for purpose.
- Production of digital surface model (DSM).

1.3 SURVEY AREA DESCRIPTION

The 'Site' consisted of the existing Staffin Harbour breakwater and slipway extended along the coast to include the area of the new proposed breakwater. The area mapped extended to approximately 9.2ha, although much of this area was open water.

2 METHODOLOGY

2.1 DATA CAPTURE

Flight planning identified the need for two individual flights to adequately cover the desired area at the appropriate resolution.

Weather conditions on 6th July were favourable with bright conditions and no significant wind. The sea state was assessed as being smooth with wavelets between 0.1 to 0.5 metres.

The details of the data capture process is presented in Table 1. Due to the target of the data capture process the image overlap was set relatively high at 75% along track and 75% between tracks.

At the request of the client no ground control points were used as absolute positional accuracy was not a primary aim of the mapping process.

All aerial survey work will be undertaken in accordance with both the detailed safety precautions within Tracks Ecology's Operating Manual and Civil Aviation Authority (CAA) regulations. Tracks Ecology holds a Certificate of Competency for flights within the A2 subcategory and a General Visual Line of Sight Certificate.

Table 1: Summary of flight details and processing

Component	Pre Excavation
UAV Platform	DJI Phantom 4 Professional
RGB Sensor	1" CMOS Effective pixels 20M
RGB Lens	FOV 84° 8.8mm - 24mm (35mm format equivalent) f/2.8-f/11
Total number of RGB images	308 (292 calibrated, 16 uncalibrated as contained insufficient land)
Flight Application	Maps Made Easy v4.1.16
Viewing Device	Apple iPhone 11
Number of flights	2
Flight 1	185 images, 22 minute flight time
Flight 2	124 images, 16 minute flight time
Flight altitude from TOLP	70m approx., no terrain following
Maximum flight speed	5m/s
Average GSD - RGB	0.0163m
Ground Control Points	No – at request of client
Processing software	Pix4DMapper Pro v4.6.4
GIS Software	QGIS v3.4.4 Madeira

3 RESULTS

3.1 RGB PROCESSING

All RGB images were transferred to a desktop computer and checked for quality and assessed whether they were fit for purpose. No images were discarded at this stage. No other adjustments were made to images at this stage.

Images were then selected for use within Pix4DmapperPro. Initially sparse point clouds were created with outputs checked for any anomalies.

The imagery was processed with orthomosaics, digital elevation models and dense point clouds produced.

Appendix 1 includes the full report from Pix4D for the project.

4 DISCUSSION

Overall the mapping mission was successful although the detail of sub surface areas was perhaps sub-optimal due to the effect of the sea state. However, it was assessed that the output was fit for purpose.

As no ground control points were used it is not possible to compute a useful assessment of the absolute accuracy. The relative accuracy of the outputs are expected to be in the region of 1-3 times the GSD, so within the range of 1.63-4.89cm. If required further processing can be undertaken to correct the model where suitable ground control points become available. It is important to note the limitations of an approach without ground control points when it comes to absolute accuracy. With the workflow used within this project an absolute accuracy of 1-3m is expected in the 'x' and 'y', however the absolute accuracy of the 'z' is very poor, although the relative accuracy remains good. The current outputs are therefore not suitable for use for 'surveying' purposes although the digital elevation model could be somewhat 'corrected' within a GIS environment.

APPENDIX 1 – PIX4D REPORT

Quality Report

Generated with Pix4Ddiscovery version 4.6.4

Important: Click on the different icons for:

Help to analyze the results in the Quality Report

Additional information about the sections

Click here for additional tips to analyze the Quality Report

Summary

Project	Staffin Harbour
Processed	2021-07-06 19:59:01
Camera Model Name(s)	FC6310_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.63 cm / 0.64 in
Area Covered	0.093 km^2 / 9.2971 ha / 0.04 sq. mi. / 22.9854 acres
Time for Initial Processing (without report)	48m:34s

Quality Check

Images	median of 57214 keypoints per image	✓
Dataset	292 out of 308 images calibrated (94%), all images enabled	⚠
Camera Optimization	0.2% relative difference between initial and optimized internal camera parameters	✓
Matching	median of 19738.3 matches per calibrated image	✓
Georeferencing	yes, no 3D GCP	⚠

Preview

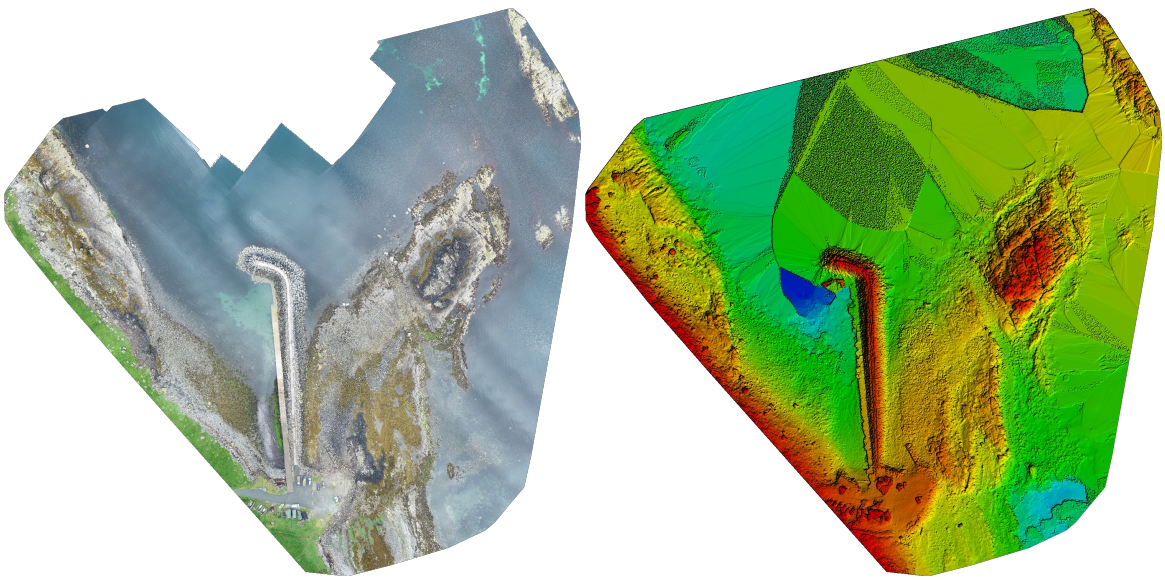


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details

Number of Calibrated Images	292 out of 308
Number of Geolocated Images	308 out of 308

Initial Image Positions

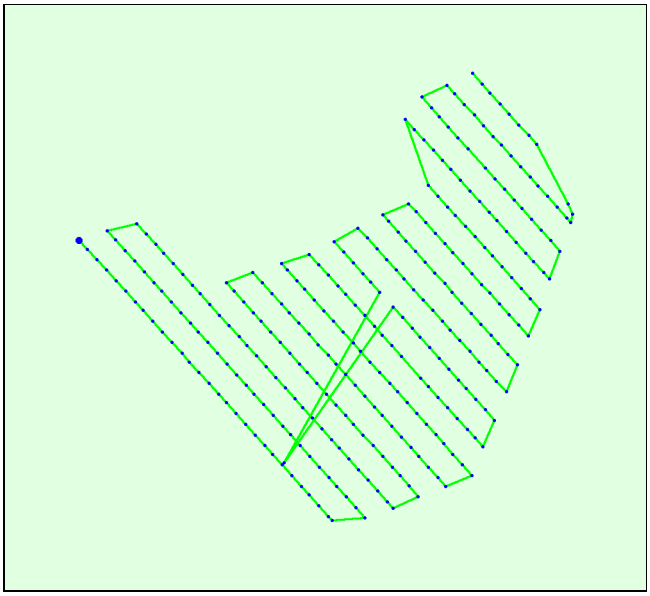
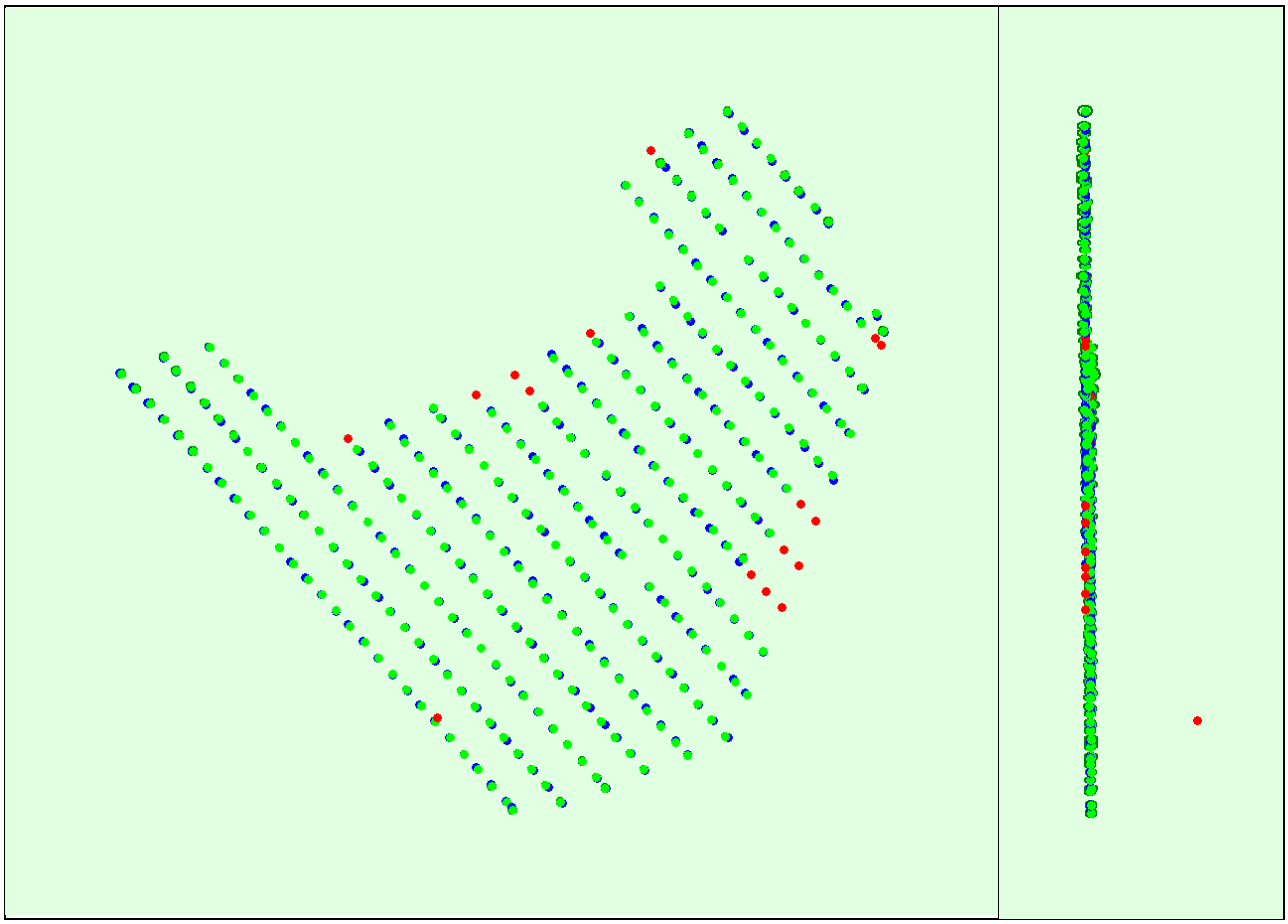
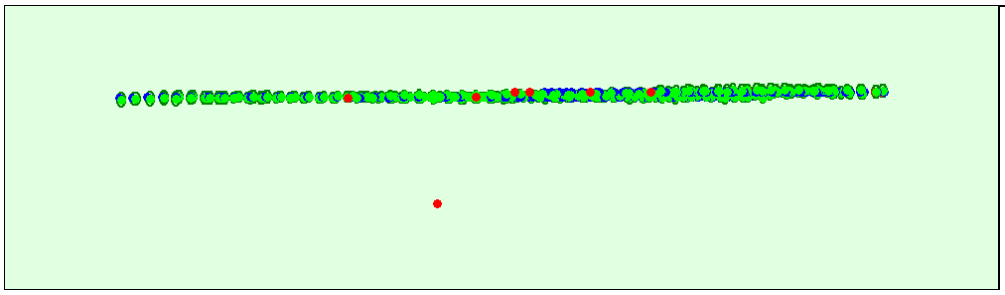


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

Computed Image/GCPs/Manual Tie Points Positions





Uncertainty ellipses 10x magnified

Figure 3: Offset between initial (blue dots) and computed (green dots) image positions as well as the offset between the GCPs initial positions (blue crosses) and their computed positions (green crosses) in the top-view (XY plane), front-view (XZ plane), and side-view (YZ plane). Red dots indicate disabled or uncalibrated images. Dark green ellipses indicate the absolute position uncertainty of the bundle block adjustment result.

Absolute camera position and orientation uncertainties

	X [m]	Y [m]	Z [m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.153	0.153	0.266	0.066	0.066	0.046
Sigma	0.028	0.027	0.029	0.002	0.004	0.003

Overlap

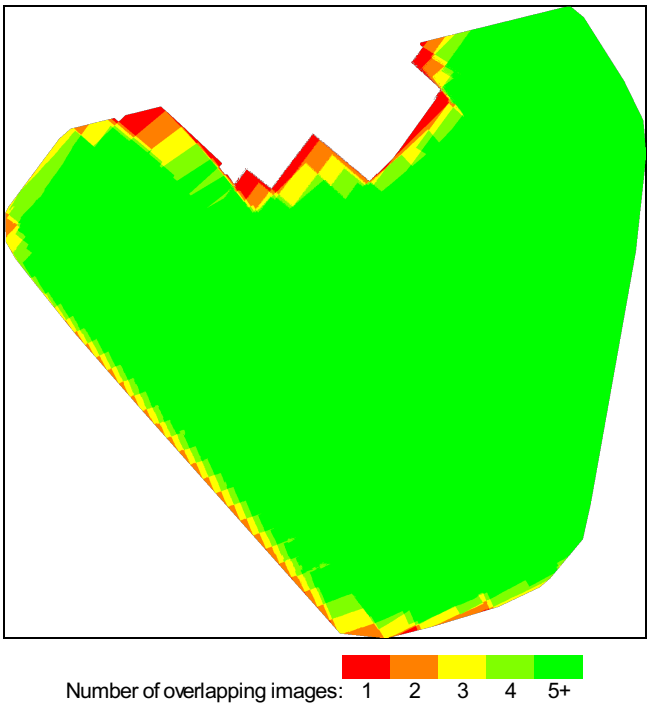


**Figure 4: Number of overlapping images computed for each pixel of the orthomosaic.
Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good quality results will be generated as long as the number of keypoint matches is also sufficient for these areas (see Figure 5 for keypoint matches).**

Bundle Block Adjustment Details

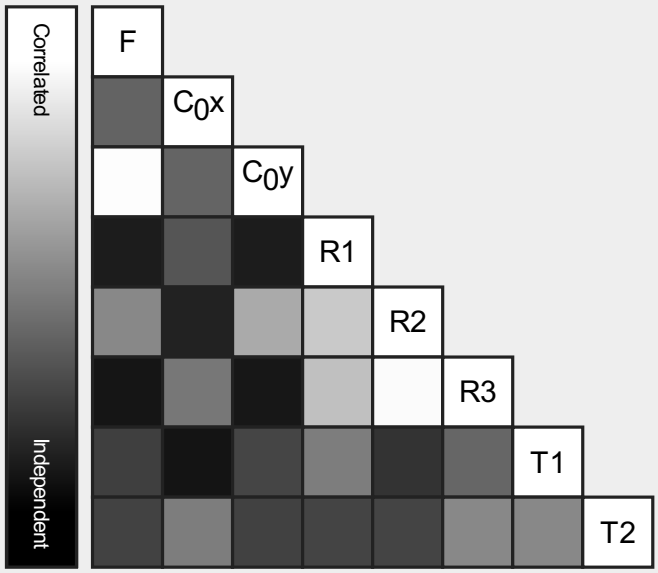
Number of 2D Keypoint Observations for Bundle Block Adjustment	6138762
Number of 3D Points for Bundle Block Adjustment	1984128
Mean Reprojection Error [pixels]	0.152

Internal Camera Parameters

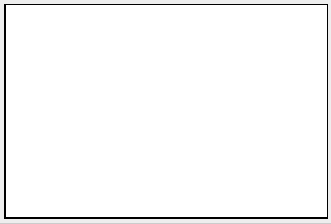
FC6310_8.8_5472x3648 (RGB). Sensor Dimensions: 12.833 [mm] x 8.556 [mm]

EXIF ID: FC6310_8.8_5472x3648

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	3668.759 [pixel] 8.604 [mm]	2736.001 [pixel] 6.417 [mm]	1823.999 [pixel] 4.278 [mm]	0.003	-0.008	0.008	-0.000	0.000
Optimized Values	3661.303 [pixel] 8.587 [mm]	2750.282 [pixel] 6.450 [mm]	1821.900 [pixel] 4.273 [mm]	0.003	-0.004	0.004	-0.001	0.002
Uncertainties (Sigma)	3.271 [pixel] 0.008 [mm]	0.094 [pixel] 0.000 [mm]	0.640 [pixel] 0.002 [mm]	0.000	0.000	0.000	0.000	0.000



The correlation between camera internal parameters determined by the bundle adjustment. White indicates a full correlation between the parameters, ie. any change in one can be fully compensated by the other. Black indicates that the parameter is completely independent, and is not affected by other parameters.



The number of Automatic Tie Points (ATPs) per pixel, averaged over all images of the camera model, is color coded between black and white. White indicates that, on average, more than 16 ATPs have been extracted at the pixel location. Black indicates that, on average, 0 ATPs have been extracted at the pixel location. Click on the image to the see the average direction and magnitude of the re-projection error for each pixel. Note that the vectors are scaled for better visualization. The scale bar indicates the magnitude of 1 pixel error.

2D Keypoints Table

	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	57214	19738
Min	20382	105
Max	79736	48077
Mean	55530	21023

3D Points from 2D Keypoint Matches

	Number of 3D Points Observed
In 2 Images	1167260
In 3 Images	371551
In 4 Images	171041
In 5 Images	95594
In 6 Images	53621
In 7 Images	34728
In 8 Images	24323
In 9 Images	17819
In 10 Images	13020
In 11 Images	9116
In 12 Images	6644

In 13 Images	5168
In 14 Images	3779
In 15 Images	3081
In 16 Images	2212
In 17 Images	1673
In 18 Images	1252
In 19 Images	989
In 20 Images	651
In 21 Images	395
In 22 Images	166
In 23 Images	38
In 24 Images	7

2D Keypoint Matches

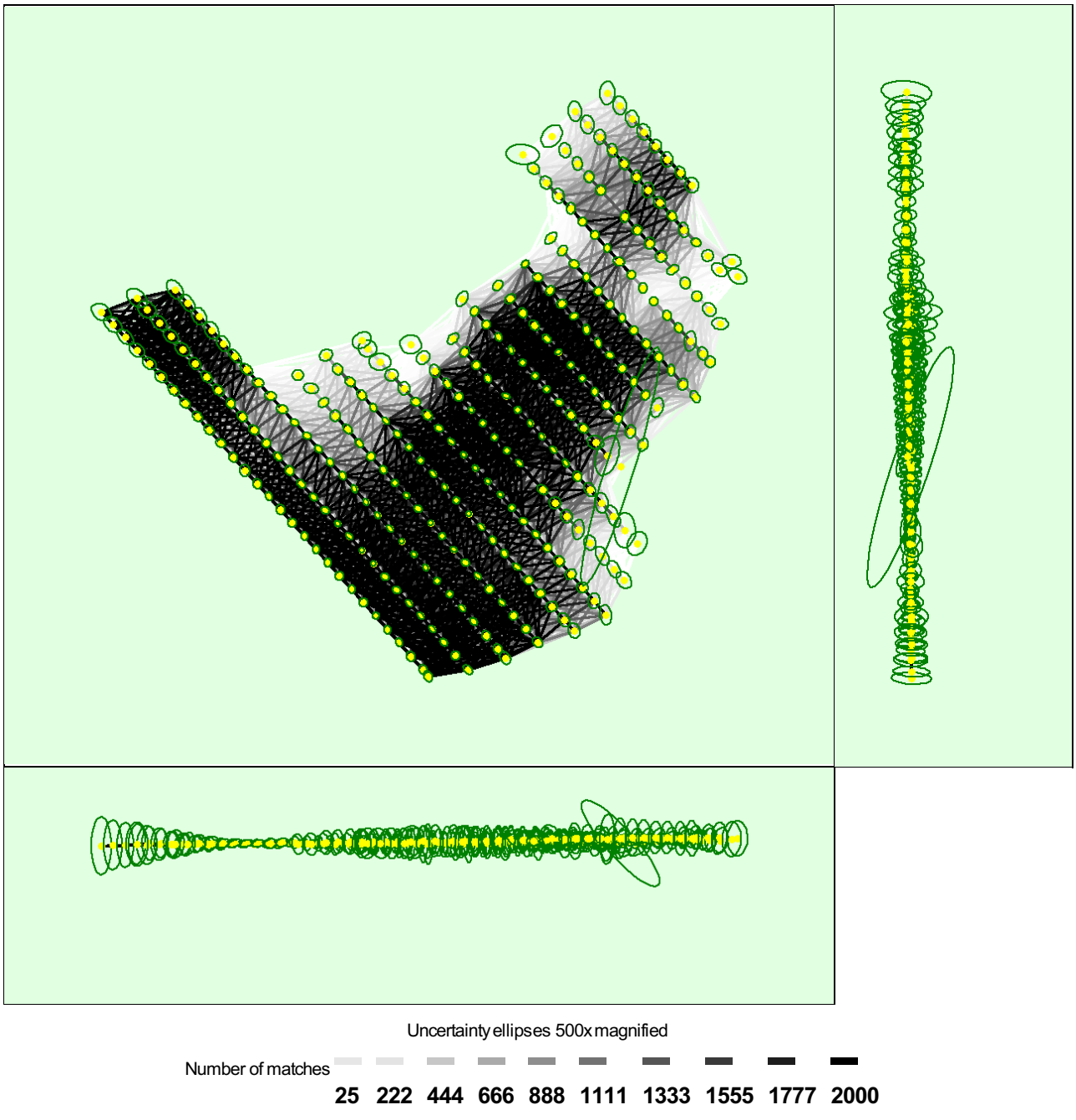


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty of the bundle block adjustment result.

Relative camera position and orientation uncertainties

	X [m]	Y [m]	Z [m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.007	0.008	0.012	0.012	0.012	0.004
Sigma	0.004	0.009	0.007	0.006	0.008	0.005

Geolocation Details

Absolute Geolocation Variance

Min Error [m]	Max Error [m]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-15.00	0.00	0.00	0.00
-15.00	-12.00	0.00	0.00	0.00
-12.00	-9.00	0.00	0.00	0.00
-9.00	-6.00	0.00	0.00	0.00
-6.00	-3.00	0.00	0.00	0.00
-3.00	0.00	51.71	51.03	53.08
0.00	3.00	48.29	48.97	46.92
3.00	6.00	0.00	0.00	0.00
6.00	9.00	0.00	0.00	0.00
9.00	12.00	0.00	0.00	0.00
12.00	15.00	0.00	0.00	0.00
15.00	-	0.00	0.00	0.00
Mean [m]		-0.000492	-0.000039	0.001750
Sigma [m]		0.927148	0.995188	0.640627
RMS Error [m]		0.927148	0.995188	0.640629

Min Error and Max Error represent geolocation error intervals between -1.5 and 1.5 times the maximum accuracy of all the images. Columns X, Y, Z show the percentage of images with geolocation errors within the predefined error intervals. The geolocation error is the difference between the initial and computed image positions. Note that the image geolocation errors do not correspond to the accuracy of the observed 3D points.

Relative Geolocation Variance

Relative Geolocation Error	Images X [%]	Images Y [%]	Images Z [%]
[-1.00, 1.00]	100.00	100.00	100.00
[-2.00, 2.00]	100.00	100.00	100.00
[-3.00, 3.00]	100.00	100.00	100.00
Mean of Geolocation Accuracy [m]	5.000000	5.000000	10.000000
Sigma of Geolocation Accuracy [m]	0.000000	0.000000	0.000000

Images X, Y, Z represent the percentage of images with a relative geolocation error in X, Y, Z.

Geolocation Orientational Variance	RMS [degree]
Omega	0.656
Phi	0.793
Kappa	11.719

Geolocation RMS error of the orientation angles given by the difference between the initial and computed image orientation angles.

Initial Processing Details

System Information

Hardware	CPU: Intel(R) Core(TM) i7-4770 CPU @ 3.40GHz RAM: 32GB GPU: NVIDIA GeForce GTX 745 (Driver: 27.21.14.5751)
Operating System	Windows 10 Home, 64-bit

Coordinate Systems

Image Coordinate System	WGS 84 (EGM96 Geoid)
Output Coordinate System	OSGB 1936 / British National Grid (EGM96 Geoid)

Processing Options

Detected Template	3D Maps
Keypoints Image Scale	Full, Image Scale: 1
Advanced: Matching Image Pairs	Aerial Grid or Corridor
Advanced: Matching Strategy	Use Geometrically Verified Matching: no
Advanced: Keypoint Extraction	Targeted Number of Keypoints: Automatic
Advanced: Calibration	Calibration Method: Standard Internal Parameters Optimization: All External Parameters Optimization: All Rematch: Auto, yes

Point Cloud Densification details

Processing Options

Image Scale	multiscale, 1/2 (Half image size, Default)
Point Density	Optimal
Minimum Number of Matches	3
3D Textured Mesh Generation	yes
3D Textured Mesh Settings:	Resolution: Medium Resolution (default) Color Balancing: no
LOD	Generated: no
Advanced: 3D Textured Mesh Settings	Sample Density Divider: 1
Advanced: Image Groups	group1
Advanced: Use Processing Area	yes
Advanced: Use Annotations	yes
Time for Point Cloud Densification	37m:25s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	14m:26s

Results

Number of Generated Tiles	1
Number of 3D Densified Points	23937583
Average Density (per m^3)	760.22

Appendix K.1: Extended Phase 1 Survey

Wallace Stone
Consulting Civil Engineers

DAL
DALGLEISH
ASSOCIATES
LIMITED

VERSION 1.2

SEPTEMBER 24, 2021

TECHNICAL REPORT

STAFFIN HARBOUR DEVELOPMENT

EXTENDED PHASE I SURVEY

REPORT REF: 21/011/AFF/R01

JAMES BUNYAN

TRACKS ECOLOGY

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DOCUMENT HISTORY

Version	Date	Issue Notes
1.1	10th August 2021	Draft for client review
1.2	24th September 2021	For issue

CONTENTS

1 INTRODUCTION

1.1 TERMS OF REFERENCE

Tracks Ecology Ltd was commissioned by Affric Limited to undertake an initial baseline ecological survey of two locations in relation to a proposed development of Staffin Harbour, Isle of Skye. The locations included the harbor site itself and a nearby quarry which is outlined for the supply of required rock, both areas combined are referred to as the Site. These Sites were subject to appropriate buffers to form the respective 'Survey Areas'. The buffer areas were generally 250m from the Site locations but were modified to suit the general topography of the area to ensure relevant areas were covered (Figure 1).

The proposed works include the modification of an existing breakwater and slipway with formation of new breakwater and slipway with associated service areas. The harbor is located close to the village of Staffin (NG 495682) with the quarry located approximately 7.5km south close to Lealt Falls (NG 519606). The full details of the proposed works, timings and construction methodology are currently not known and as such no assessment of impacts is undertaken within this report.

In addition to this survey, focal surveys with respect to otter and ornithology were undertaken and are reported under separate reports.

1.2 OBJECTIVES OF STUDY

This ecological survey and report seeks to establish the baseline ecological conditions of the Survey Area by undertaking an extended Phase I habitat survey and desktop study.

This report will detail the following:

- desk study information;
- field survey methodology;
- field survey results;
- comments on the nature conservation importance of receptors; and
- recommendations for further survey work where appropriate.

1.3 SURVEY AREA DESCRIPTION

The land surrounding the existing harbor area is dominated by the grazed grassland and wetter areas located at the base of cliffs located east of Staffin. The coastline along this section is dominated by exposed bedrock with gravels and cobble intertidal zones. The Harbour Survey Area supports a minor public road servicing the existing harbor along with the nearby tourist attraction of the 'Dinosaur Footprints' located approximately 500m north of the harbour.

The quarry area itself is dominated by exposed rock and gravels with significant areas of formed gravel hardstanding from historic quarrying activities. To the north are areas of heath and bog with the high sea cliffs located to the east. To the south is the Lealt River which predominantly flows in a wide gorge with the Lealt Falls located on the southwestern edge of the Site. The falls are a tourist attraction and the Site includes areas of car parking and picnic areas.

See Figure 1 for full details of the respective sections of the Site.

2 METHODOLOGY

2.1 DESKTOP STUDY

To provide additional contextual information a data collection exercise with respect to ecology has been undertaken.

A number of information sources were used to obtain ecological background information for the Survey Area. Information on statutory sites was obtained from the website of the statutory agency Scottish Natural Heritage (SNH) via the "Site Link Portal" (http://www.snh.org.uk/snhi/).

A review of information held on the National Biodiversity Network (NBN) Gateway website (https://data.nbn.org.uk/) was also undertaken to provide contextual background information for the location.

2.2 EXTENDED PHASE I SURVEY

An extended Phase I habitat survey, as described in the Guidelines for Baseline Ecological Assessment (Institute of Environmental Assessment 1995; Chartered Institute for Ecology and Environmental Management 2017), was undertaken by a suitably qualified ecologist (James Bunyan, Tracks Ecology and Adam Fraser, Blairbeg Consulting) during June and July 2021.

Phase I habitat survey is a standardised method of recording habitat types and characteristic vegetation, as set out in the Handbook for Phase I Habitat Survey – a technique for Environmental Audit (Joint Nature Conservation Committee 2010).

The standard Phase I methodology was extended to include an initial evaluation of habitats in accordance with those listed in the SNIFFER document Water Framework Directive (WFD) 95 A Functional Wetland Typology for Scotland (SNIFFER 2009) and through the recording of specific features indicating the presence, or likely presence, of protected species or other species of nature conservation significance. Descriptive "target notes" were recorded for characteristic habitats, features of ecological interest, or any other features which require note to aid ecologically sensitive design or mitigation (Appendix A).

The extended Phase I habitat survey was undertaken across the entire Survey Area and although it does not represent a full protected species or botanical survey, the extended Phase I method allows a suitably experienced ecologist to provide a baseline assessment of the ecology of the Survey Area so that it is possible either;

- to confirm the conservation significance of the Survey Area; or,
- to ascertain that further surveys of some aspect(s) of the Survey Area's ecology will be required before such confirmation can be made.

Floral nomenclature follows New Flora of the British Isles (Stace 2010) and Mosses and Liverworts of Britain and Ireland a field guide (Atherton, Bosanquet & Lawley 2010).

2.3 LIMITATIONS

The surveys were undertaken during June and July 2021. As a result the majority of plant species were evident although particularly early or late flowering species may not have been evident during the surveys.

The time of year was, however, an optimal time to provide a good baseline survey and enable identification of habitats. All areas of the site were accessible although a number of areas consisted of very steep ground around the quarry, sea cliffs and gorge cliffs along the Lealt

River. As a result some areas were assessed using binoculars combined with the surveyor local knowledge and experience. However, taking these factors into account it is assessed that the survey was not subject to any significant limitations.

3 RESULTS

3.1 DESKTOP STUDY

3.1.1 DESIGNATED SITES

A review of the SNHi Site Link Portal confirmed that there is one statutory designated sites within the Survey Area of the quarry. Valtos Site of Special Scientific Interest (SSSI) includes approximately 30% of the Quarry Survey Area and included all of the sea cliffs which extend up the sides of the Lealt River gorge area. The SSSI is notified for its geological formations only.

In addition, the Trotternish Ridge SSSI is located approximately 3.5km west of the Quarry and 1.7km west of the Harbour Survey Areas. This SSSI is also notified for extensive geological features along with supporting important upland, vascular and bryophyte assemblages. The Trotternish Ridge feature is also classified as a Special Area of Conservation with the boundary closely following that of the SSSI although not extending quite so far towards the Harbour Site with the edge of the SAC approximately 3km to the west. The Trotternish Ridge SAC supports numerous qualifying habitat features.

No woodland detailed on the Ancient Woodland Inventory (AWI) is present within or in close proximity to the Survey Areas.

The location of the Survey Area in relation to local designated sites is detailed on Figure 1.

Trotternish Ridge SSSI

The Trotternish Ridge Site of Special Scientific Interest (SSS) is located on the Trotternish Peninsula in the north of the Isle of Skye. It encompasses stretches of coast which reveal Jurassic age rocks of the Bathonian, Callovian, Oxfordian and Kimmeridgian Stages, the prominent escarpment of a Tertiary Igneous basalt plateau and spectacular landslip landforms associated with mass movement of the underlying rock. The basalt is strongly calcareous in parts and this contributes to the presence of a nationally important assemblage of upland habitats, as well as an outstanding assemblage of montane vascular plants and a bryophyte assemblage unique in north-west Scotland.

Trotternish Ridge SAC

The Trotternish Ridge SAC closely aligns with the SSSI although the designated area does not extend as far to the northeast. The SAC is designated for:

- Alpine and subalpine calcareous grasslands;
- Base-rich scree;
- Dry heaths;
- High-altitude plant communities associated with areas of water seepage (priority habitat);
- Montane acid grasslands;
- Plants in crevices on base-rich rocks;
- Species-rich grassland with mat-grass in upland areas (priority habitat); and
- Tall herb communities.

3.1.2 NON-STATUTORY DESIGNATED SITES

It is understood that no Scottish Wildlife Trust reserves or Local Nature Conservation Sites are located within the Survey Area or within a 2km buffer.

3.1.3 GEOLOGY AND HYDROLOGY

The geology of the area is dominated by the large and dramatic volcanic rock steps formed from magma intrusions over the Jurassic sedimentary rocks. These intrusions form the steep high cliffs associated with both the Quarry and Harbour Survey Areas.

The information on soil types (Scottish Government 2014) confirms that the Survey Areas are a mix of drifts derived from basaltic rocks and organic deposits as well as drifts derived from Jurassic limestones and shales. On flatter ground peaty gleys with dystrophic blanket peat are also present where conditions allow their formation.

The Site is within the Skye District Salmon Fishery Board (SDSFB).

3.1.4 LOCAL RECORDS

No records for protected mammal species were present within the Site. However a number of protected marine mammal species are present in close proximity include a number of marine species including common dolphin *Delphinus delphis,* grey seal *Halichoerus grypus,* harbour seal *Phoca vitulina* and common porpoise *Phocoena phocoena.* Protected terrestrial mammal species records are limited to that of otter *Lutra lutra.*

Due to the coastal location of the Survey Areas records for many bird species are present within 2km of the Survey Areas including: little auk *Alle alle*, teal *Anas crecca,* Greenland white-fronted goose *Anser albifrons flavirostris*, red-throated diver *Gavia stellata*,: black-throated diver *Gavia arctica* and manx shearwater *Puffinus puffinus*. Other species include common sandpiper *Actitis hypoleucos,* house sparrow *Passer domesticus* and skylark *Alauda arvensis.*

3.2 EXTENDED PHASE I

The findings of the extended Phase I habitat survey were mapped (Figure 2). Target notes of features of ecological interest noted during the survey are detailed at Appendix A, with a species list from the Phase I survey presented at Appendix B. The habitats present and their respective coverage across the Survey Areaa are detailed in Table 1.

Table 1: Phase I habitats and coverage within the Survey Area in order of overall coverage.

Phase 1 Habitats	Area ha (% of total)		
	Harbour	Quarry	Total
B5 - Marsh/marshy grassland*	3.069 (32.1)	1.326 (5.9)	4.395 (13.6)
B3.1 - Calcareous grassland – unimproved*	0.050 (0.5)	4.001 (17.7)	4.051 (12.6)
D6 - Wet heath/acid grassland mosaic*		3.402 (15.0)	3.402 (10.6)
C1.1 - Bracken - continuous	0.993 (10.4)	1.975 (8.7)	2.968 (9.2)
E1.7 - Wet modified bog		2.679 (11.8)	2.679 (8.3)
D2/B5 - Wet heath/marshy grassland*	0.547 (5.7)	1.650 (7.3)	2.197 (6.8)
H1.3 - Intertidal: boulders and rocks	1.723 (18)	0.250 (1.1)	1.973 (6.1)
B1.1/B2.1 - Acid/neutral grassland	0.685 (7.2)	1.064 (4.7)	1.749 (5.4)
J3.6 - Road	0.380 (4.0)	0.913 (4.0)	1.293 (4.0)
I1.1 - Inland rock	0.258 (2.7)	0.799 (3.5)	1.057 (3.3)
B1.1 - Acid grassland - unimproved	0.985 (10.3)		0.985 (3.1)
J4/J1.3 - Bare ground/short-perennial		0.887 (3.9)	0.869 (2.8)
B2.2 - Neutral grassland - semi-improved		0.818 (3.6)	0.818 (2.5)

B1.1/B2.1/C1.2 - Acid/neutral grassland/Scattered bracken	0.764 (8.0)		0.764 (2.4)
A3.1 - Scattered trees - broadleaved		0.548 (2.4)	0.548 (1.7)
C3.1 - Tall herb and fern - ruderal		0.511 (2.3)	0.511 (1.6)
J4 - Bare ground		0.439 (1.9)	0.439 (1.4)
A1.1.1 - Broadleaved woodland - semi-natural		0.417 (1.8)	0.417 (1.3)
J4/B2.1 - Bare ground/neutral grassland		0.364 (1.6)	0.364 (1.1)
B3.1/B2.1 - Calcareous/neutral grassland*		0.247 (1.1)	0.247 (0.8)
I1.2 - Scree	0.002 (<0.1)	0.150 (0.7)	0.152 (0.5)
B3.1/C1.2 - Calcareous grassland/Scattered bracken*		0.118 (0.5)	0.118 (0.4)
I1.2/B1.1 - Scree/Acid grassland	0.071 (0.7)		0.071 (0.2)
J3.6 - Buildings and gardens	0.033 (0.3)	0.029 (0.1)	0.062 (0.2)
B3.1/I1.2 - Calcareous grassland/Scree*		0.059 (0.3)	0.059 (0.2)
A2.1 - Scrub – continuous*		0.017 (0.1)	0.017 (0.1)
A3.1/C1.2 - Scattered trees/Scattered bracken		<0.001 (<0.1)	<0.001 (<0.1)
Grand Total	9.56 (100)	22.663 (100)	32.205 (100)

* Habitats within the context of the Survey Area with potential to support wetland typology as defined within the SNIFFER document WFD 95 (SNIFFER, 2009).

Woodlands and scrub

Areas of woodland are limited across both sites, however crags of the Lealt gorge and above An Corran beach (outwith the survey area) have occasionally dense canopy cover. At Lealt gorge, the woodland cover is more developed and contains mature sessile oak *Quercus petraea,* sycamore *Acer pseudoplatanus,* downy birch *Betula pubescens,* rowan *Sorbus aucuparia,* alder *Alnus glutinosa* and hazel *Corylus avellana*. The understorey contains mostly bracken *Pteridium aquilinum*, grasses and occasional great wood-rush *Luzula sylvatica,* blaeberry *Vaccinium myrtillus,* hard fern *Blechnum spicant* and honeysuckle *Lonicera periclymenum.*

Scrub is generally dominated by patches of European gorse *Ulex europaeus* and eared willow *Salix aurita* scrub with bracken common throughout. These areas were most common on upper slopes of ground above and below cliffs or steep ground. Small patches are present at Lower Tote along the roadside and drainage channels in the Lealt gorge. Scattered trees are also present along roadside verges.

The woodland and scrub habitats included:

A1.1.1 - Broadleaved woodland - semi-natural – This habitat is dominated by the W11 *Quercus petraea-Betula pubescens-Oxalis acetosella* woodland located on the steep sides of the Lealt River gorge. This type of woodland is recognised as an Annex 1 habitat under European Union Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora which in Scotland, is translated into legal obligations by the Conservation (Natural Habitats, &c.) Regulations 1994 (Habitat Regulations). In addition the woodland habitat is recognised as a UK Biodiversity Action Plan priority habitat within the old sessile oak woods with *Ilex* and *Blechnum* habitat.

A2.1 - Scrub – continuous – Scrub is limited to a small patch within the edge of the existing quarry this habitat was comprised of W23 *Ulex europaeus – Rubus fruticosus* scrub and supported the usual sparse and species-poor assemblage.

A3.1 - Scattered trees – Along the banks of the public road in the southern section of the Quarry Survey Area scattered trees are present with bracken often dominating the ground flora. These areas are on damp to wet soils in many places. These woodlands are generally in line with a variant of W1x *Salix cinerea-Galium palustre* woodland, *Salix aurita* upland

variant. Tree density within the areas is low and scattered and influenced by land drainage associated with the public road. Nonetheless they do offer some value as a sparse version of wet woodland, a UK BAP priority habitat. Wet woodland such as this has a relatively low dependence on groundwater and due to the artificial drainage channels and impacts of the existing road infrastructure and adjacent land management any dependency is likely to be artificially created to some degree.

C1.1 - Bracken – continuous – Bracken is commonly found in dense swathes, predominantly on the steep slopes often present under woodland canopies and on open grassland areas. Where present it is often dense and continuous although within woodland areas and scattered trees this dominance is somewhat reduced.

Mires and heaths

Mires and heaths are not generally common habitats within the Survey Areas, however some grassland communities are derived from heath communities having been modified by drainage and livestock grazing. Within the Harbour Survey Area, wet heath communities on flatter slopes now have significant grassland characteristics with mosaics with marshy grassland common in the south.

Within the Quarry Survey Area the higher ground utilised for livestock grazing is generally a mosaic of wet heath and acid grassland communities. The exception is the land to the west of the public road where blanket mire and wet heath habitats persist, but are heavily modified by peat-cutting, drainage and livestock grazing. Here blanket mire communities, typified by M17 *Trichophorum germanicum-Erica tetralix* blanket mires are locally rich in *Sphagna* but also contain much common cotton-grass *Eriophorum angustifolium*, heath rush *Juncus squarrosus* and tormentil, indicating some localised drying and modification.

Calcareous grassland communities, particularly on cliffs at Lower Tote, south of the Quarry and An Corran, may also be derived from species-rich H10 *Calluna vulgaris-Erica cinerea* dry heaths but heathy species are now heavily browsed and sparse.

D6 - Wet heath/acid grassland mosaic – This habitat is formed from a mosaic of M15 *Trichophorum germanicum-Erica tetralix* wet heath and U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland. The habitat dominates the more semi-natural areas of the Quarry Survey Area in the north which is particularly impacted upon by sheep grazing. M15 *Trichophorum germanicum-Erica tetralix* wet heath is recognised as Annex 1 habitat within the Habitat Regulations and is a UK Biodiversity Action Plan priority habitat within the upland heathland classification. The grassland component of this mosaic is dominated by MG10 *Holcus lanatus-Juncus effusus* rush-pasture and is a generally widespread habitat. The wet heath and acid grassland habitats have a moderate and low potential dependency on groundwater respectively.

E1.7 - Wet modified bog – An area of wet modified bog formed by a near uniform cover of M17 *Trichophorum germanicum-Eriophorum vaginatum* blanket mire is present in the west of the Quarry Survey Area. As detailed above these are heavily modified by peat-cutting, drainage and livestock grazing. These habitats are likely located on deep peat (greater than 0.5m) although no peat depth survey points were taken. Small areas of wet modified bog is also present in the areas of wet heath, but these were generally very limited in size.

D2/B5 - Wet heath/marshy grassland – Wet heath habitats are again found in mosaics with marshy grassland with a mosaic of M15 *Trichophorum germanicum-Erica tetralix* wet heath, MG10 *Holcus lanatus-Juncus effusus* rush-pasture and M23a *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community. The main areas of wet heath/marshy grassland is on the low ground in the south of the Harbour Survey Area and a large area in the west of the Quarry Survey Area. The patchy *M23a Juncus*

effusus/acutiflorus-Galium palustre rush-pasture habitats are recognised as being within the upland slushes, fens and swamps UK BAP habitat and have a high potential dependency on groundwater. The MG10 grasslands and M15 wet heath both have a more moderate potential dependency on groundwater. In addition the M15 wet heath is recognised as a component of the Northern Atlantic wet heaths with *Erica tetralix* habitat which is an Annex 1 habitat within the Habitat Regulations.

Grasslands and montane communities

Grasslands are the dominant habitat type across both sites, and are frequently in complex mosaics as local topography, geology and hydrology allow for fine-scale transitions. Acid grasslands are least frequent, but still influence other communities with red fescue *Festuca rubra*, sweet-vernal grass *Anthoxanthum odoratum* and common bent *Agrostis capillaris* grasses and heath bedstraw *Galium saxatile* and tormentil present in many swards. Neutral grasslands are common and crested dog's-tail *Cynosurus cristatus,* yorkshire-fog *Holcus lanatus* and cock's-foot *Dactylis glomerata* are present in acid/neutral and marshy grassland types.

Calcareous grasslands are most common at Lower Tote on the eastern side of the Quarry Survey Area, being present across much of the steeper slopes above the shoreline, and dominated by crested dog's-tail, thyme *Thymus polytrichus,* bird's-foot trefoil *Lotus corniculatus*, yarrow *Achillea millefolium* and mat-grass *Nardus stricta.*

Marshy grasslands are abundant, and in many cases transitional to acid and neutral grasslands, as well as wet heath communities. Here, soft rush *Juncus effusus*, lesser spearwort *Ranunculus flammula* and sharp-flowered rush *Juncus articulatus* can dominate with yellow-flag *Iris pseudacorus* and black bog-rush *Schoenus nigricans* locally abundant. Ragged robin *Silene flos-cuculi*, marsh violet *Viola palustris*, meadow buttercup *Ranunculus acris*, marsh bedstraw *Galium palustre*, heath rush, common cotton-grass, common sorrel *Rumex acetosa* and marsh willowherb *Epilobium palustre* are also occasional in the sward.

B5 - Marsh/marshy grassland – A significant area of the Quarry Survey Area in the west is dominated by marshy grassland with swards almost uniformly comprised MG10 *Holcus lanatus-Juncus effusus* rush-pasture. This area is either side of the unclassified road leading west along the Lealt River. The area is impacted on by sheep grazing, vehicle movements and drainage.

Marshy grassland also comprised the majority of the lower slopes within the Harbour Survey Area. These areas support a more diverse mix of communities with a dominance of MG10a *Holcus lanatus-Juncus effusus* rush-pasture typical sub-community and MG10c *Holcus lanatus-Juncus effusus* rush-pasture *Iris pseudacorus* sub-community. In addition, these areas support numerous areas of *M23a Juncus effusus/acutiflorus-Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community and occasionally more heathy sections with a mix of M15 *Trichophorum germanicum-Erica tetralix* wet heath and drier U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland. As detailed before, the of MG10a *Holcus lanatus-Juncus effusus* rush-pasture is recognised as being potentially dependent on groundwater, with M23a *Juncus effusus/acutiflorus-Galium palustre* rush-pasture potentially highly dependent on groundwater. Where these habitats are in close mosaics the potential dependency has been recognised as moderate to high reflecting their constituent communities.

B1.1 - Acid grassland – unimproved – On the rocky steep slopes at the base of the cliffs within the Harbour Survey Area large areas of unimproved acid grassland is present amongst the large boulders and close to the harbor buildings. This habitat is dominated by a mosaic of U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, U5 *Nardus stricta – Galium*

saxatile grassland and U6 *Juncus squarrosus - Festuca ovina* grassland. The small area behind the harbor buildings has an increased presence of the wetter U6 *Juncus squarrosus - Festuca ovina* grassland and as such may have some moderate dependency on groundwater, possibly as a result of the harbor infrastructure resulting in ground and surface flow being affected to some degree. Where areas of scree are present beneath the cliff within the Harbour Survey Area, acid grassland communities of U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland with MG10 *Holcus lanatus-Juncus effusus* rush-pasture are present colonising the thin soils.

B1.1/B2.1 - Acid/neutral grassland – Within the north of the Harbour Survey Area the strip of grassland becomes narrow between the cliffs and the public road. This area supports a more neutral assemblage of grassland communities with a mosaic of U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland and MG10 *Holcus lanatus-Juncus effusus* rush-pasture. Also within these areas are localised acidic communities as well as localised calcicolous communities. The latter supports CG10 *Festuca ovina-Agrostis capillaris-Thymus polytrichus* grassland. These areas all support a relatively shot sward with the presence of heavy sheep grazing. Although CG10 *Festuca ovina-Agrostis capillaris-Thymus polytrichus* grassland is identified as a component of the Annex 1 habitat, species-rich *Nardus* grassland, on siliceous substrates in mountain areas as well as being within the UKBAP habitat Upland calcareous grassland.

The Quarry Survey Area also supported areas of acid/neutral grassland predominantly located around the quarry area. These areas are a mosaic of U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland and MG6 *Cynosurus cristatus-Lolium perenne* ley and were subject to disturbance from quarrying activities and sheep grazing.

B2.2 - Neutral grassland - semi-improved - Along the eastern side of the public road within the Quarry Survey Area an area of neutral grassland formed by a sward dominated by MG6 *Cynosurus cristatus-Lolium perenne* ley is present with historical disturbance and enrichment from the road construction and land management resulting in the presence of pockets of OV25 *Urtica dioica-Cirsium arvense* community and OV27 *Epilobium angustifolium* community.

B1.1/B2.1/C1.2 - Acid/neutral grassland/Scattered bracken – Many of the above acid and neutral grassland communities are also present in combination with scattered and some areas more dense bracken.

B3.1 - Calcareous grassland – unimproved – The very steep slopes around the cliffs within the Quarry Survey Area support extensive areas of calcicolous grassland dominated by CG10a *Festuca ovina-Agrostis capillaris-Thymus polytrichus* grassland, *Trifolium repens-Luzula campestris* sub-community. These areas are often inaccessible due to the extreme topography but are still heavily influenced by grazing sheep creating a short sward with many areas dominated by thyme. The CG10 *Festuca ovina-Agrostis capillaris-Thymus polytrichus* grassland communities can often have a high dependency on groundwater, however, in this instance the presence of the habitat on very steep ground is likely to result in a reduced dependency on groundwater although a low-to moderate dependency may still be present with groundwater influence potentially occurring at a number of locations. Calcareous grassland ia also found within areas of scree located on the steep slopes.

B3.1/B2.1 - Calcareous/neutral grassland – A large area of the upper slopes to the east of the quarry is grassland with less of a calcareous influence supporting a mosaic of MG6 *Cynosurus cristatus-Lolium perenne* ley and CG10 *Festuca ovina-Agrostis capillaris-Thymus polytrichus* grassland.

C1.2 – Scattered bracken – many of the grassland communities support areas of scattered bracken along with areas of denser bracken although even at these locations the species coverage rarely exceeded 80%.

J4/B2.1 - Bare ground/neutral grassland – Within and around the quarry, areas of bare ground are present from historic quarry workings and associated infrastructure. Many of these areas support some colonisation from neutral grassland communities of MG6 *Cynosurus cristatus-Lolium perenne* ley and MG10 *Holcus lanatus-Juncus effusus* rush-pasture with smaller pockets of CG10 *Festuca ovina-Agrostis capillaris-Thymus polytrichus* grassland.

Other communities

Other communities present are restricted to habitats of ephemeral/perennial and ruderal species, with larger patches of common nettle *Urtica dioica,* creeping thistle *Cirsium arvense,* rosebay willowherb *Chamaerion angustifolium* present along roadsides and disturbed ground. Short-perennial vegetation is present at low abundance within bare ground areas of the disused quarry and car parks at the Quarry Survey Area and also along roadsides and the slipway area at the harbor.

Scree, typically large boulders but occasionally smaller patches of smaller boulders and gravels, and exposed rock cliffs are present at both sites along and below crag-lines. Buildings, roads and paths are also present at both sites.

Strand-line vegetation was generally not present and restricted to very few plants of thrift *Armeria maritima*, and as such not included in this report.

3.2.1 LINEAR FEATURES

A number of post and wire fences and timber fences are present within the Quarry Area demarcating boundaries along the public road and also for public safety near the cliff edges and car park.

Other than the main watercourse of the Lealt River which is located outwith the Quarry Survey Area, a single small watercourse and a number of wet and dry ditches are present. The ditches are all in relation to the drainage of the road corridor and are generally simple cut off drains along with sections of concreted channels. The small watercourse is located adjacent to the quarry with its source located on the edge of the area of semi-natural heath and bog to the north of the Survey Area. This watercourse runs beneath some of the large boulder scree along the eastern edge of the quarry before dropping down the steep slope past the remnant industrial buildings.

3.2.2 PLANT SPECIES

The majority of the higher plant species recorded during the survey are common and widespread species and are listed as plants of least concern in (Cheffings *et al.* 2005). During the survey no non-native or invasive species were identified although as detailed within the limitations the topography made accessibility to all areas difficult.

3.2.3 GROUNDWATER DEPENDENT TERRESTRIAL ECOSYSTEMS

GWDTEs are protected from disturbance under the Water Framework Directive, which is transposed into Scottish Law, through the Water Environment and Water Services (Scotland) Act (WEWS) 2003.

A number of habitats were identified within the Survey Area that have the potential to support GWDTEs (Figure 4 and Table 2).

Highly dependent habitats include the areas supporting M23 *Juncus effusus/acutiflorus-Galium palustre* rush-pasture. This habitat is potentially highly dependent on groundwater and was present within the Harbour Survey Area in association with MG10 *Holcus lanatus-Juncus effusus* rush-pasture which is potentially moderately dependent on groundwater. Mosaics dominated by these habitats are present along much of the flatter ground beneath the high cliffs within the Harbour Survey Area and the habitats extend up to the existing public road and between the road and the shore. Extensive drainage ditches have been dug across this area and it is likely that groundwater remains a significant influence in the area. The groundwater is likely to be significantly influenced by the dramatic topography, although specific details of the geohydrology is not known.

In addition, a number of habitats are potentially moderately dependent on groundwater, including calcareous grassland habitats dominated by CG10 *Festuca ovina-Agrostis capillaris-Thymus polytrichus* grassland communities, wet heath/marshy grassland mosaics with M15 *Trichophorum germanicum-Erica tetralix* wet heath and MG10 *Holcus lanatus-Juncus effusus* rush-pasture communities as well as more uniform stands of MG10 rush-pasture. These habitats are located in the south of the Harbour Survey Area, on almost all areas of steep ground within the Quarry Survey Area and in the flatter ground to the west of the public road opposite the quarry.

Large areas of habitats not dependent on groundwater are also present along with areas of peatland, which although dependent on specific hydrological scenario, they are not dependent on groundwater.

However, it should be noted that almost all habitats within the Survey Area are subject to some disturbance from grazing from sheep and artificial drainage.

3.3 PROTECTED SPECIES

3.3.1 BATS

Within the Harbour Survey Area a single building was present formed by a low stone store structure with corrugated tin roof. Although this structure supports some limited opportunities for bats, the exposed location and northern latitude results in the general suitability of the building being assessed to be very low. No access to within the building was possible during the survey but no signs of use by bats was evident from the exterior. Three shipping containers were also present adjacent to the building, but these did not offer any suitability for use by bats.

The trees located within the Survey Areas will remain unaffected by the proposed works and many of these trees were located in inaccessible locations and could not be inspected to a significant degree. It is possible that such trees do support roosting opportunities but these are likely to support suboptimal conditions for regular use by bats in an exposed coastal scenario. In addition, the cliff faces located both within the Harbour and Quarry Survey Areas may also offer some suboptimal roost sites but taking into account the location of the features in an exposed location at a northerly location, the likelihood of such features being used by bats is assessed as being very low.

At the Quarry Survey Area the remains of the diatomite industry from the late 1800s are evident on the shore line with the remains of a number of buildings. Two main structure remain, these include the walls of a relatively large structure and a chimney stack. The remaining walls of the former building are thick stone walls and support a number of window and door openings with lintels present. The size and relatively sheltered location of these features offers some suitability for use by bats. No signs of use were present, but the unsafe nature and inaccessible location of the buildings made full assessments difficult. The chimney

stack in particular offers potential for use by bats as the interior of the chimney may offer suitable cracks and crevices as well as a very sheltered environment for bats.

3.3.2 [redacted]

[redacted]

3.3.3 SCOTTISH WILDCAT

Scottish wildcat are absent from the Isle of Skye.

3.3.4 WATER VOLE

There is only very limited suitable habitats for water vole within the Survey Areas. The drainage channels within the Harbour Survey Area were unsuitable for use by water vole due to the majority of the area being heavily grazed. Areas where suitable habitat is present in the south of the Harbour Survey Area were extremely limited and isolated due to the cliffs. No signs of water vole were observed during the survey when focal searches were undertaken in key habitats.

3.3.5 RED SQUIRREL

Red squirrel are generally thought to be absent from the Isle of Skye and no significant habitat suitable for red squirrel is located within the Survey Areas.

3.3.6 PINE MARTEN

No signs of pine marten were identified during the survey and no recent records of pine marten have been recorded within 10km of the Survey Area. It is thought that pine marten were absent from Skye until the road bridge was built and the species started to colonise the island. Populations are still concentrated in the south of the island with no records close to the Survey Area. The Survey Areas does provide some suitable habitat features for denning and foraging, especially within the large boulder scree and riverine habitats, but the lack of records combined with the sub-optimal nature of the Site suggests that pine marten are likely to be absent.

3.3.7 BADGER

No badger setts or activity of badgers was identified within the Survey Area and badger distribution across Skye is limited. Similarly to pine marten the Survey Areas do provide some suitable habitat features for denning and foraging, especially within the large boulder scree and riverine habitats, but the lack of records combined with the sub-optimal nature of the Site suggests that badger are likely to be absent.

3.3.8 AMPHIBIANS AND REPTILES

Although the Survey Areas do offer some suitability for reptile species including common lizard *Zootoca vivipara* and to a lesser extent adder *Vipera berus* and slow worm *Anguis fragilis*, reptile distribution across the island is limited and patchy with no records present within 10km of the Survey Area.

The heavily grazed and areas largely devoid of vegetation are unlikely to support adder or slow worm although these areas may support common lizard. No signs of any reptile species being present was identified during the survey, although it is likely that a low density population of common lizard are present across the semi-natural heath and bog habitats.

3.3.9 ORNITHOLOGY

Ornithological surveys were undertaken as part of the baseline surveys and are detailed within a separate report.

3.3.10 AQUATIC ECOLOGY

The Quarry Survey Area extended up to the edge of the Lealt River. The River Lealt extends for approximately 6.5km but the significant falls approximately 0.5km from the mouth of the river limits movement of migratory fish. Although the stretch of river accessible to salmon *Salmo salar* is very limited, the Lealt is confirmed to support breeding salmon and is a well-known fishing river, albeit limited to a single pool beneath the waterfall. The river is a high spate river with a relatively wide channel (up to 12m) below the falls and a series of pools and riffles, with a large pool located beneath the Lealt falls. No detailed assessment of the river was undertaken as part of this survey.

Within the Quarry Survey Area a small watercourse also runs adjacent to the quarry with its source located on the edge of the area of semi-natural heath and bog to the north of the Survey Area. This watercourse runs beneath some of the large boulder scree along the eastern edge of the quarry before dropping down the steep slope past the remnant industrial buildings. This watercourse is rarely more than 0.5m in width but signs of spate conditions were evident. A significant portion of the watercourse flows out of sight beneath scree and boulders. There is not accessibility to the river for migratory fish.

4 DISCUSSION

4.1 DESIGNATED SITES

With respect to the proposed works at the Harbour Survey Area, no impacts are expected as a result of the proposed development on terrestrial designated sites due to the scale of the works and the distance of the sites from the harbor area.

The works at the Quarry are also outwith any designated sites but are located in close proximity to the Valtos SSSI. As this SSSI is notified for geological features the assessment of impacts is not considered here but may need to be taken into account during the development.

4.2 HABITATS

The conservation value of the relevant NVC communities are detailed within Table 2.

4.2.1 QUARRY SURVEY AREA

A number of habitats of conservation value are present within the Quarry Survey Area. This include habitats identified as being Annex 1 habitats, UK BAP priority habitats and those potentially afforded protection under the Water Framework Directive as they are potentially dependent on groundwater.

The W11 *Quercus petraea-Betula pubescens-Oxalis acetosella* woodland located on the steep ground adjacent to the Lealt River represents a remnant of the woodland which would have been far more widespread and due to the precarious location as managed to remain. This habitat is recognised as being an Annex 1 habitat as well as a UK BAP priority habitat.

Although the woodland communities along the road which support W1x *Salix cinerea-Galium palustre* woodland, *Salix aurita* upland variant is included within the wet woodland (except as isolated Willow trees) UK BAP habitat the habitat in this scenario is artificial to some degree due to the association with the public road corridor. Nonetheless the scattered trees do offer some habitat value.

The grassland of primary concern within the Survey Area is the CG10 *Festuca ovina-Agrostis capillaris-Thymus polytrichus* grassland which is likely to qualify under the species-rich *Nardus* grassland, on siliceous substrates in mountain areas Annex 1 habitat as well as the

upland calcareous grassland UK BAP habitats. The areas of higher quality identified as unimproved are located on the steep slopes of the Quarry Survey Area and fall outwith the planning boundary of the quarry.

The M23 *Juncus effusus/acutiflorus-Galium palustre* rush-pasture is only found as often indistinct mosaics within the MG10 *Holcus lanatus-Juncus effusus* rush-pasture. M23 rush pasture is recognised as being a UK BAP priority habitat and these areas are also recognised as having potentially moderate-high dependency on groundwater.

The wetland areas included M15 *Trichophorum germanicum-Erica tetralix* wet heath which is a component of the Annex 1 habitat Northern Atlantic wet heaths with Erica tetralix as well as being a UK BAP priority habitat. The examples of the habitats within the Quarry Survey Area are not high quality examples. The bog communities are located on the distal side of the public road from the quarry. M17 *Trichophorum germanicum-Eriophorum vaginatum* blanket mire and M1 *Sphagnum denticulatum* bog pool community are both recognised as being components of the Annex 1 blanket bog habitat as well as being a UK BAP priority habitat.

Table 2: Summary of conservation value and potential dependency on groundwater of NVC communities.

Habitat type	**Status***	**Potential Groundwater Dependency****
Broadleaved woodland (A1)		
W11 *Quercus petraea-Betula pubescens-Oxalis acetosella woodland*,	Old sessile oak woods with *Ilex* and *Blechnum* in Britain and Ireland; Upland oakwood	Low
Scrub (A2)		
W23 *Ulex europaeus – Rubus fruticosus* scrub		
Scattered trees (A3)		
W1x *Salix cinerea-Galium palustre* woodland, *Salix aurita* upland variant	Wet woodland (except as isolated Willow trees)	Low-Moderate
Acid grassland (B1)		
U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland		Low
U4a *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, Typical sub-community		Low
U4b *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, *Holcus lanatus-Trifolium repens* sub-community		Low
U5 *Nardus stricta – Galium saxatile* grassland		Low
U6 *Juncus squarrosus - Festuca ovina* grassland		Moderate
Neutral grassland (B2)		
MG6 *Cynosurus cristatus-Lolium perenne* ley		Low
MG10 *Holcus lanatus-Juncus effusus* rush-pasture		Low
Calcareous grassland (B3)		
CG10 *Festuca ovina-Agrostis capillaris-Thymus polytrichus* grassland	Species-rich *Nardus* grassland, on siliceous substrates in mountain areas; Upland calcareous grassland	Low-Moderate
CG10a *Festuca ovina-Agrostis capillaris-Thymus polytrichus* grassland, *Trifolium repens-Luzula campestris* sub-community	Species-rich *Nardus* grassland, on siliceous substrates in mountain areas; Upland calcareous grassland	Low-Moderate
Marsh/marshy grassland (B5)		
MG10 *Holcus lanatus-Juncus effusus* rush-pasture		Moderate
MG10a *Holcus lanatus-Juncus effusus* rush-pasture typical sub-community		Moderate
MG10c *Holcus lanatus-Juncus effusus* rush-pasture *Iris pseudacorus* sub-community		Moderate

M23 *Juncus effusus/acutiflorus-Galium palustre* rush-pasture	Upland flushes, fens and swamps	High
M23a *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community	Upland flushes, fens and swamps	High
M23b *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, *Juncus effusus* sub-community	Upland flushes, fens and swamps	High
Tall herb and fern communities (C1 and C3)		
U20 *Pteridium aquilinum-Galium saxatile* community		Low
U20a *Pteridium aquilinum-Galium saxatile* community, *Anthoxanthum odoratum* sub-community		Low
OV25 *Urtica dioica-Cirsium arvense* community		Low
OV27 *Epilobium angustifolium* community		Low
Wet heath (D2)		
M15 *Trichophorum germanicum-Erica tetralix* wet heath	Northern Atlantic wet heaths with *Erica tetralix*; Upland heathland	Moderate
Wet modified bog (E1.7)		
M1 *Sphagnum denticulatum* bog pool community	Blanket bog; Blanket bog	Peatland
M17 *Trichophorum germanicum-Eriophorum vaginatum* blanket mire	Blanket bog; Blanket bog	Peatland
Other non-NVC habitats		N/A
I1.1 Inland cliff – acid/neutral		N/A
I1.2 Scree – acid/neutral		N/A
J1.3 Disturbed land - Ephemeral/short-perennial vegetation		N/A
J3.6 Buildings and gardens		N/A
J4 Bare ground		N/A

***Status key**
Red text – Annex I habitat under EC Habitats Directive (as translated into UK legislation)
Black text – Scottish Biodiversity List / UK Biodiversity Action Plan priority habitat
****Groundwater dependency** assessed based on: SEPA (2014) Land Use Planning System SEPA Guidance Note 31 – Guidance on Assessing the Impacts of Windfarm Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems

4.3 GROUNDWATER DEPENDENT TERRESTRIAL ECOSYSTEMS

From the information obtained during the survey it is assessed that the only habitats present within the Survey Area confirmed as being highly dependent on groundwater are the flushed grassland areas dominated by M23 *Juncus effusus/acutiflorus-Galium palustre* rush-pasture communities. These are located on the low slopes of the Harbour Survey Area along the public road and further south. These areas have been modified to some degree by the presence of numerous drainage channels as well as the presence of the public road and associated roadside drainage. Even though the habitats are found in mosaic with less groundwater dependent habitats and taking into account the drainage, some moderate to high dependency on groundwater is likely to remain.

4.4 PROTECTED SPECIES

Excluding otter, the survey results of which are presented in a separate report, no evidence to suggest protected species are using the Survey Areas as a place of shelter or for significant foraging or commuting was identified. It cannot be ruled out that a number of protected species including pine marten and badger may pass through the Survey Area and care should always be taken not to allow entrapment of animals within any equipment, excavations or stored materials.

5 REFERENCES

Atherton, I., Bosanquet, S. & Lawley, M. (2010) *Mosses and Liverworts of Britain and Ireland a Field Guide*. British Bryological Society.

Chartered Institute for Ecology and Environmental Management. (2017) *Guidelines for Preliminary Ecological Appraisal*, 2nd ed. IEEM, Winchester.

Cheffings, C.M., Farrell, L. (Eds), Dines, T.D., Jones, R.A., Leach, S.J., McKean, D.R., Pearman, D.A., Preston, C.D., Rumsey, F.J. & Taylor, I. (2005) The Vascular Plant Red Data List for Great Britain. Species Status. *Species Status*, **7**, 1–116.

Institute of Environmental Assessment. (1995) *Guidelines for Baseline Ecological Assessment.* E & FN Spon, London.

Joint Nature Conservation Committee. (2010) *Handbook for Phase I Habitat Survey - a Technique for Environmental Audit*. JNCC.

Scottish Government. (2014) Scotlands Soils. URL https://soils.environment.gov.scot/

SNIFFER. (2009) *A Functional Wetland Typology for Scotland UKTAG*.

Stace, C.A. (2010) *New Flora of the British Isles*. Cambridge University Press.

APPENDIX A – TARGET NOTES

Survey Area	TN	X	Y	
Harbour	1	149477	867933	Habitats below crags above the harbour are dominated by drier acid grassland in mosaic with patches of neutral and occasionally calcareous grassland. Lower slopes are wetter, as break of slope allows water to seep and saturate soil. Here there are greater coverage of marshy grassland species including Yellow flag *Iris pseudacorus*, sharp-flowered rush *Juncus articulatus*, heath rush *Juncus squarrosus*, soft rush *Juncus effusus* and lesser spearwort *Ranunculus flammula*.
Harbour	2	149350	868199	Steeper slopes to the north of site are drier and have more bracken *Pteridium aquilinum* and acid grassland species. However thyme *Thymus polytrichus* is present in small amounts along with heathy species heather *Calluna vulgaris* and tormentil *Potentilla erecta*.
Harbour	3	149528	867984	Flat areas of ground to the south of site are heavily drained but retain characteristics of marshy grassland and wet heath communities. Soft rush *Juncus effusus*, lesser spearwort *Ranunculus flammula*, yellow flag *Iris pseudacorus* and Yorkshire-fog *Holcus lanatus* are abundant. In areas where heathland may have been the original vegetation type, prior to drainage and grazing by livestock, wet heath species cross-leaved heath *Erica tetralix*, tormentil *Potentilla erecta*, heather *Calluna vulgaris* and occasional Sphagna mosses are abundant. Drained areas have abundant bog pondweed *Potamogeton polygonifolius*, carnation sedge *Carex panicea* and Lesser spearwort Ranunculus flammula.
Harbour	4	149472	868009	Small patches of black bog-rush *Schoenus nigricans* are present within areas of wet heath/marshy grassland mosaics.
Harbour	5	149477	868056	Drainage channels are shallow but frequent across flatter areas. Common cotton-grass *Eriophorum angustifolium* and ragged robin *Silene flos-cuculi* are occasional.
Harbour	6	149583	867930	Wet heath derived communities have higher coverage of acidic mosses including Sphagna, and increased coverage of heath rush *Juncus squarrosus*, heather *Calluna vulgaris*, cross-leaved heath *Erica tetralix*, common sedge *Carex nigra* and tormentil *Potentilla erecta*.
Harbour	7	149567	867985	Small patches of calcareous grassland are present at the shoreline with thyme *Thymus polytrichus* and Carnation sedge *Carex panicea* present at low abundance. Creeping buttercup *Ranunculus repens*, white clover *Trifolium repens* and crested dog's-tail *Cynosurus cristatus* are also abundant.
Harbour	8	149462	868271	Above the harbor area, sections of bracken *Pteridium aquilinum* is present on higher northern slopes. Crags themselves are steep, but sparsely vegetated with ivy *Hedera helix*, scattered trees including rowan *Sorbus aucuparia*, eared willow *Salix aurita*, Sitka spruce *Picea sitchensis*, Scot's pine

				Pinus sylvestris and ferns including scaly-male fern *Dryopteris affinis.*
Harbour	9	149250	868327	Steep crags support ivy *Hedera helix* on bare rock, bracken *Pteridium aquilinum* below crags and acid and marshy/neutral grassland dominated by MG10 *Holcus lanatus – Juncus effusus* rush-pasture communities below.
Harbour	10	149550	867794	Numerous drainage channels are present across the flatter ground to south of site draining the areas of marshy grassland and wet heath mosaics.
Quarry	11	151929	860679	To the north of the Quarry a significant gully is present with steep slopes dominated by large boulders with more exposed slopes dominated by calcareous grassland, and barer rockier scree.
Quarry	12	151923	860707	Bracken *Pteridium aquilinum* and calcareous grassland dominates sections of the gully and in places acid grassland and neutral grassland communities are more dominant or in transition between each other.
Quarry	13	151945	860578	Scree slopes and calcareous grassland evident across the area.
Quarry	14	151887	860540	Thyme *Thymus polytrichus* is abundant in all grassland areas, across a short turf of grasses and white clover *Trifolium repens*.
Quarry	15	151902	860501	Large patches of bracken *Pteridium aquilinum* are present across this area especially on upper slopes of the cliffs.
Quarry	16	152002	860523	Calcareous grassland and bracken *Pteridium aquilinum* communities dominant to the shoreline on the lower slopes of the cliffs and around the mouth of the Lealt River.

APPENDIX B – FLORAL SPECIES LIST

Species	Common name
Achillea millefolium	Yarrow
Achillea ptarmica	Sneezewort
Agrostis canina	Velvet Bent
Agrostis capillaris	Common Bent
Agrostis vinealis	Brown Bent
Aira praecox	Early Hair-grass
Alchemilla mollis	Garden Lady's-mantle
Alnus glutinosa	Alder
Angelica sylvestris	Wild Angelica
Anthoxanthum odoratum	Sweet Vernal-grass
Bellis perennis	Daisy
Betula pubescens	Downy Birch
Blechnum spicant	Hard-fern
Calluna vulgaris	Heather
Caltha palustris	Marsh-marigold
Campanula rotundifolia	Harebell
Cardamine pratensis	Cuckooflower
Carex binervis	Green-ribbed Sedge
Carex demissa	Common Yellow-sedge
Carex echinata	Star Sedge
Carex hostiana	Tawny Sedge
Carex nigra	Common Sedge
Carex panicea	Carnation Sedge
Carex rostrata	Bottle Sedge
Cerastium fontanum	Common Mouse-ear
Cerastium glomeratum	Sticky Mouse-ear
Chamerion angustifolium	Rosebay Willowherb
Cirsium arvense	Creeping Thistle
Cirsium palustre	Marsh Thistle
Cirsium vulgare	Spear Thistle
Conopodium majus	Pignut
Corylus avellana	Hazel
Cynosurus cristatus	Crested Dog's-tail
Dactylis glomerata	Cock's-foot
Deschampsia cespitosa	Tufted Hair-grass
Deschampsia flexuosa	Wavy Hair-grass
Digitalis purpurea	Foxglove
Dryopteris affinis agg.	Scaly Male-fern
Dryopteris dilatata	Broad Buckler-fern
Epilobium brunnescens	New Zealand Willowherb
Epilobium palustre	Marsh Willowherb
Equisetum fluviatile	Water Horsetail
Equisetum palustre	Marsh Horsetail
Equisetum sylvaticum	Wood Horsetail
Erica cinerea	Bell Heather
Erica tetralix	Cross-leaved Heath

Eriophorum angustifolium	Common Cottongrass
Eriophorum vaginatum	Hare's-tail Cottongrass
Euphrasia arctica	Euphrasia
Euphrasia scottica	Euphrasia
Festuca rubra	Red Fescue
Festuca vivipara	Viviparous Sheep's-fescue
Filipendula ulmaria	Meadowsweet
Fragaria vesca	Wild Strawberry
Fraxinus excelsior	Ash
Galium aparine	Cleavers
Galium palustre	Marsh-bedstraw
Galium saxatile	Heath Bedstraw
Galium verum	Lady's Bedstraw
Hedera helix	Common Ivy
Hieracium agg.	Hawkweed
Holcus lanatus	Yorkshire-fog
Holcus mollis	Creeping Soft-grass
Hypericum pulchrum	Slender St John's-wort
Juncus acutiflorus	Sharp-flowered Rush
Juncus articulatus	Jointed Rush
Juncus bufonius	Toad Rush
Juncus bulbosus	Bulbous Rush
Juncus effusus	Soft-rush
Linum catharticum	Fairy Flax
Lonicera periclymenum	Honeysuckle
Lotus corniculatus	Common Bird's-foot-trefoil
Luzula multiflora subsp. Congesta	Heath Wood-rush
Luzula multiflora subsp. Multiflora	Heath Wood-rush
Luzula sylvatica	Great Wood-rush
Lysimachia nemorum	Yellow Pimpernel
Molinia caerulea	Purple Moor-grass
Myosotis arvensis	Field Forget-me-not
Myosotis scorpioides	Water Forget-me-not
Nardus stricta	Mat-grass
Narthecium ossifragum	Bog Asphodel
Oreopteris limbosperma	Lemon-scented Fern
Oxalis acetosella	Wood-sorrel
Picea sitchensis	Sitka Spruce
Pilosella officinarum	Mouse-ear-hawkweed
Pinus sylvestris	Scot's Pine
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Poa annua	Annual Meadow-grass
Polygala serpyllifolia	Heath Milkwort
Polypodium vulgare	Polypody
Potamogeton polygonifolius	Bog Pondweed
Potentilla erecta	Tormentil
Primula vulgaris	Primrose
Prunella vulgaris	Selfheal
Prunus padus	Bird Cherry
Pteridium aquilinum	Bracken

Quercus petraea	Sessile Oak
Ranunculus acris	Meadow Buttercup
Ranunculus flammula	Lesser Spearwort
Ranunculus repens	Creeping Buttercup
Rosa sp.	a Rose
Rubus fruticosus agg.	Bramble
Rumex acetosa	Common Sorrel
Rumex acetosella	Sheep's Sorrel
Sagina procumbens	Procumbent Pearlwort
Salix aurita	Eared Willow
Schoenus nigricans	Black bog-rush
Scorzoneroides autumnalis	Autumn Hawkbit
Senecio jacobaea	Common Ragwort
Sorbus aucuparia	Rowan
Stellaria alsine	Bog Stitchwort
Taraxacum agg.	Dandelion
Teucrium scorodonia	Wood Sage
Thymus polytrichus	Wild Thyme
Trichophorum germanicum agg.	Deergrass
Trifolium pratense	Red Clover
Trifolium repens	White Clover
Urtica dioica	Common Nettle
Vaccinium myrtillus	Bilberry
Vaccinium vitis-idaea	Cowberry
Veronica chamaedrys	Germander Speedwell
Veronica officinalis	Heath Speedwell
Veronica serpyllifolia	Thyme-leaved Speedwell
Viola palustris	Marsh Violet
Viola riviniana	Common Dog-violet

APPENDIX C – PHOTOGRAPHS

Plate 1: Habitats below crags above the harbour are dominated by drier acid grassland in mosaic with patches of neutral and occasionally calcareous grassland with lower slopes wetter, as break of slope allows water to seep and saturate soil.

Plate 2: Steeper slopes to the north of the Harbour Survey Area are drier and have more Bracken *Pteridium aquilinum* and acid grassland species.

Plate 3: Flat areas of ground to the south of the Harbour Survey Area are heavily drained but retain characteristics of marshy grassland and wet heath communities.

Plate 4: Small patches of black bog-rush *Schoenus nigricans* are present within areas of wet heath/marshy grassland mosaics.

Plate 5: Drainage channels are shallow but frequent across flatter areas of the Harbour Survey Area.

Plate 6: Wet heath derived communities have higher coverage of acidic mosses including *Sphagna*.

Plate 7: Small patches of calcareous grassland are present at the shoreline with thyme and carnation sedge present at low abundance.

Plate 8: View back to cliffs from the current breakwater. Areas of bracken can be seen on higher northern slopes on right of image.

Plate 9: Steep crags with ivy on bare rock, bracken below crags and acid and marshy/neutral grassland dominated by MG10 *Holcus lanatus – Juncus effusus* rush-pasture communities below.

Plate 10: View over bay, highlighting drainage channels on flatter ground to south of site.

Plate 11: View through gully to north of Quarry Survey Area, showing slopes dominated by calcareous grassland, and barer rockier scree.

Plate 12: View up gully with scree slopes, bracken and calcareous grassland.

Plate 13: View across bay, with scree slopes and calcareous grassland evident across the wider area.

Plate 14: Within the Quarry Survey Area thyme is abundant in all grassland areas, across a short turf of grasses and white clover.

Plate 15: Large patches of bracken are also present, especially on upper slopes of the cliffs.

Plate 16: Looking south across the bay, with calcareous grassland and bracken communities dominant to the shoreline.

APPENDIX D – FIGURES

Staffin Harbour Improvements - Quarry

Figure 1a: Site Location

Affric making it happen

149500 150000 150500 151000 151500 152000 152500 153000 153500 154000

862500 862000 861500 861000 860500 860000 859500 859000

Cul nan Cnoc/ Culnaenoc
Valtos - SSSI
Valtos - SSSI
Breckrey
Lonfearn
Greallainn/ Grealin
Lethallt/ Lealt
Valtos - SSSI
Abhainn An Lethuillt / Lealt River
Lon Teanga
Lower Tote
Upper Tote
A855

- Survey Area
- OS 10m contours
- Special Area of Conservation
- Special Protection Area
- Site of Special Scientific Interest
- Ramsar Site
- Local Nature Reserve

Ancient Woodland Inventory

- Ancient (semi-natural origin)
- Long-Est.(plantation origin)
- Other (on Roy map)

TRACKS ecology

0 200 400 m

Scale @ A3 - 1:15,000

N

Drawing number: T21/018/AFF/002
Revision: 1
Date of production: 2021-07-30
Drawn by: JB - Tracks Ecology
Projection: British National Grid EPSG:27700

Staffin Harbour Improvements - Harbour

Figure 1b: Site Location

Affric making it happen

Trotternish Ridge - SSSI

Staffin Bay

Staffin Island

Stafainn - Steinnseall/ Staffin - Stenscholl

Stafainn/ Staffin

Broaig

Cadha Riach

Stafainn - An Garadh Fada/ Staffin - Garafad

Stafainn - An Clachan/ Staffin - Clachan

Lon Glas

Lon Gritiota

Staffin - Stenscholl River

A855

147000 147500 148000 148500 149000 149500 150000 150500 151000 151500 152000

870000 869500 869000 868500 868000 867500 867000 866500

- Survey Area
- OS 10m contours
- Special Area of Conservation
- Special Protection Area
- Site of Special Scientific Interest
- Ramsar Site
- Local Nature Reserve

Ancient Woodland Inventory

- Ancient (semi-natural origin)
- Long-Est.(plantation origin)
- Other (on Roy map)

TRACKS ecology

0 200 400 m

Scale @ A3 - 1:15,000

N

Drawing number: T21/018/AFF/003
Revision: 1
Date of production: 2021-07-30
Drawn by: JB - Tracks Ecology
Projection: British National Grid EPSG:27700

Staffin Harbour Improvements - Quarry

Figure 2a: Habitats

Affric making it happen

151600 151800 152000 152200

860800 860600 860400

M15/MG10 100
U4/MG6 80: MG10 10: OV27 10
U20 80: MG6 10: CG10 10
M15/U4
M17 100
OV27 80: MG6 15: W1x 5
W23 100
M15/MG10 65: M15/17 30: M6 5
MG6 65: OV25 15: OV27 10: CG10a 5: U4a 5
Bare ground 40: MG6 20: CG10a 10: MG10 10
Scree 100
U20 100
CG10a 80: U20 10: MG6 10
MG6 60: CG10a 30: W23 4: Bare ground 4: U20 2
U20 85: CG10a 10: MG6 5
CG10a 65: U20 35
U20 96: CG10 4
MG10 100
W1x 70: OV27 20: MG6 10
U4/MG6 100
U20 91: W1x 6: U4/MG10 3
U20 80: CG10a 20
CG10a 50: Scree 50
W1x 30: U20 60: OV27 10
W11
CG10a 78: Scree 12: U20 10
U20 88: CG10 12
U20 96: CG10 4

12 11 13 14 15 16

- Survey Area
- Quarry Planning Boundary
- OS 10m contours
- Acid/neutral grassland
- Bracken - continuous
- Buildings and gardens
- Calcareous grassland - unimproved
- Inland rock
- Marsh/marshy grassland
- Road
- Scree
- Wet heath/marshy grassland
- Bare ground
- Bare ground/neutral grassland
- Bare ground/short-perennial
- Broadleaved woodland - semi-natural
- Calcareous grassland/ Scattered bracken
- Calcareous grassland/Scree
- Calcareous/neutral grassland
- SI Neutral grassland - semi-improved
- Scattered trees - broadleaved
- Scattered trees/Scattered bracken
- Scrub - continuous
- Tall herb and fern - ruderal
- Wet heath/acid grassland mosaic
- Wet modified bog
- Intertidal boulders and rocks
- Scattered broadleaved tree
- Fence
- Dry ditch
- Running water

TRACKS ecology

0 40 80 m

N

Scale @ A3 - 1:2,500

Drawing number: T21/018/AFF/002
Revision: 1
Date of production: 2021-07-30
Drawn by: JB - Tracks Ecology
Projection: British National Grid EPSG:27700

Staffin Harbour Improvements - Harbour

Figure 2b: Habitats

Affric making it happen

149200 149400 149600 149800

868400 868200 868000 867800

Scree 99: U5/CG10 1

U4/MG10 65: U5a 15: CG10a 10: U20 5: Bare rock 5

U20a 85: CG10/U4 15

Scree 55: U4/MG10 45

U4/MG10 65: U5a 15: CG10a 10: U20 5: Bare rock 5

MG10a/c 55: M23a 25: M15/U4 20

U4/MG10 65: U20 20: CG10a 15

U20a 85: CG10/U4 15

U4/MG10 65: U20 20: CG10a 15

MG10a/c 55: M23a 25: M15/U4 20

U5/6 40: MG10a 40: CG10a 10: M23a 10

CG10a 80: MG10 20

U20a 85: CG10/U4 15

U4/MG10 65: U20 20: CG10a 15

U4/MG10 65: U5a 15: CG10a 10: U20 5: Bare rock 5

CG10a 80: MG10 20

CG10a 80: MG10 20

MG10a/c 55: M23a 25: M15/U4 20

M15/U5 60: MG10 20: M23a 10: U4 9: M1 1

U20a 85: CG10/U4 15: CG10a 15

U4/MG10 65: U20 20: CG10a 15

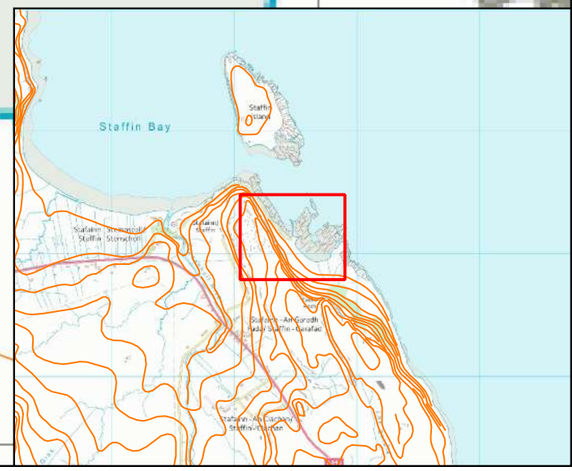
U20a 85: CG10/U4 15 20: CG10a 15

U4/MG10 65: U20 20: CG10a 15

U20a 85: CG10/U4 15

U4/MG10 65: U5a 15: CG10a 10: U20 5: Bare rock 5

1 2 3 4 5 6 7 8 9 10



- Survey Area
- OS 10m contours
- Acid grassland - unimproved
- Acid/neutral grassland
- Acid/neutral grassland/ Scattered bracken
- Bracken - continuous
- Buildings and gardens
- Calcareous grassland - unimproved
- Inland rock
- Marsh/marshy grassland
- Road
- Scree
- Scree/Acid grassland
- Wet heath/marshy grassland
- Intertidal boulders and rocks
- Dry ditch

TRACKS ecology

0 40 80 m

N

Scale @ A3 - 1:2,500

Drawing number: T21/018/AFF/003
Revision: 1
Date of production: 2021-07-30
Drawn by: JB - Tracks Ecology
Projection: British National Grid EPSG:27700

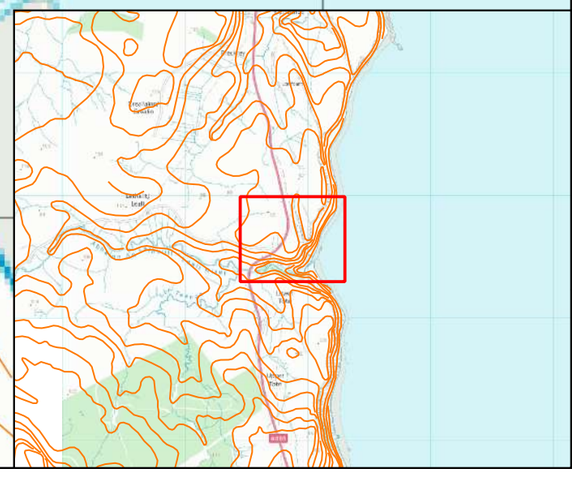
Staffin Harbour Improvements - Quarry

Figure 3a: GWDTE

151600
151800
152000
152200
860800
860600
860400
92

Survey Area
Quarry Planning Boundary
OS 10m contours

GWDTE
Low
Low-Moderate
Moderate
Moderate-High
High
None



TRACKS ecology

0 40 80 m

Scale @ A3 - 1:2,500

N

Drawing number: T21/018/AFF/004
Revision: 1
Date of production: 2021-07-30
Drawn by: JB - Tracks Ecology
Projection: British National Grid EPSG:27700

149200
149400
149600
149800
868400
868200
868000
867800

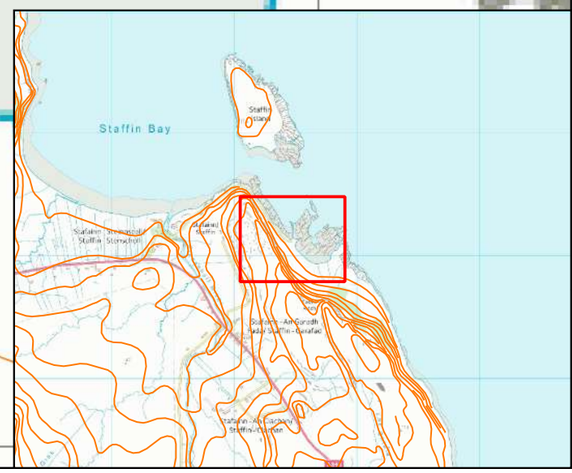
Staffin Harbour Improvements - Harbour

Figure 3b: GWDTE

Affric making it happen

Survey Area
OS 10m contours

GWDTE
Low
Low-Moderate
Moderate
Moderate-High
High
None



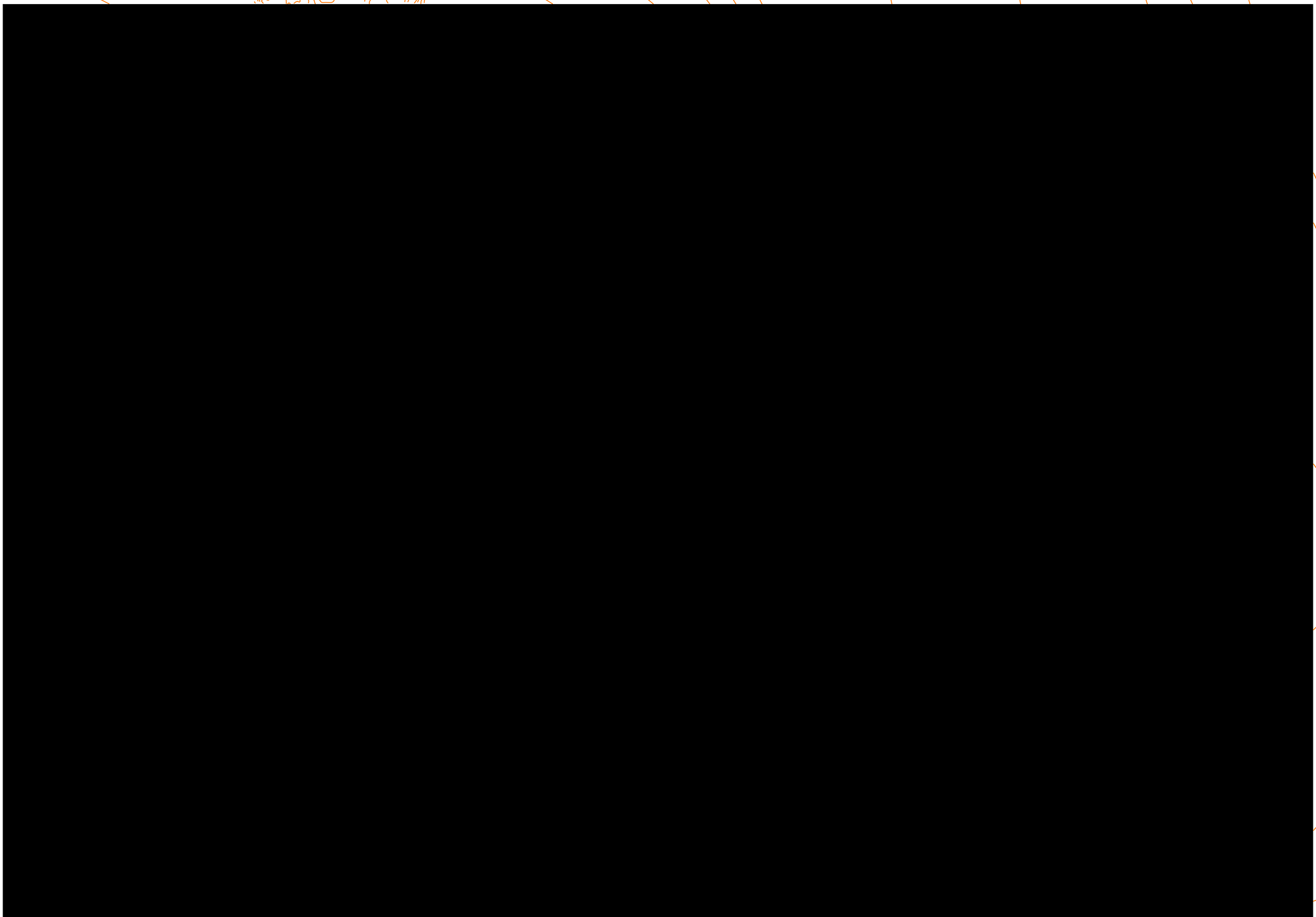
TRACKS ecology

0 40 80 m

N

Scale @ A3 - 1:2,500

Drawing number: T21/018/AFF/004
Revision: 1
Date of production: 2021-07-30
Drawn by: JB - Tracks Ecology
Projection: British National Grid EPSG:27700



Appendix K.3: Ornithological Surveys

VERSION 1.2

SEPTEMBER 24, 2021

TECHNICAL REPORT

STAFFIN HARBOUR DEVELOPMENT

ORNITHOLOGICAL SURVEYS

REPORT REF: 21/011/AFF/R03

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TRACKS ECOLOGY

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DOCUMENT HISTORY

Version	Date	Issue Notes
1.1	11th August 2021	Draft for client review
1.2	24th September 2021	For issue

CONTENTS

1 INTRODUCTION

1.1 TERMS OF REFERENCE

Tracks Ecology was commissioned to undertake a series of ornithological surveys across two locations in relation to a proposed development of Staffin Harbour, Isle of Skye. The locations included the harbor site itself and a nearby quarry which is outlined for the supply of required rock, both areas combined are referred to as the Site. These Sites were subject to appropriate buffers to form the respective 'Survey Areas'. The buffer areas were generally 250m from the Site locations but were modified to suit the general topography of the area to ensure relevant areas were covered (Figure 1).

The proposed works include the modification of an existing breakwater and slipway with formation of new breakwater and slipway with associated service areas. The harbor is located close to the village of Staffin (NG 495682) with the quarry located approximately 7.5km south close to Lealt Falls (NG 519606). The full details of the proposed works, timings and construction methodology are currently not known and as such no assessment of impacts is undertaken within this report.

In addition to this survey, habitat and otter surveys were undertaken and are reported under separate reports.

1.2 OBJECTIVES OF STUDY

This ecological survey and report seeks to establish the baseline ecological conditions of the Survey Areas by undertaking a series of ornithological surveys.

This report aims to:

- Identify the ornithological receptors present across the site; and
- Evaluate their status and nature conservation value.

No assessment of the potential impacts of the proposed development was undertaken.

1.3 SURVEY AREA DESCRIPTION

The land surrounding the existing harbor area is dominated by the grazed grassland and wetter areas located at the base of cliffs located east of Staffin. The coastline along this section is dominated by exposed bedrock with gravels and cobble intertidal zones. The Harbour Survey Area supports a minor public road servicing the existing harbor along with the nearby tourist attraction of the 'Dinosaur Footprints' located approximately 500m north of the harbour. The existing breakwater support large rock armour with many voids.

The quarry area itself is dominated by exposed rock and gravels with significant areas of formed gravel hardstanding from historic quarrying activities. To the north are areas of heath and bog with the high sea cliffs located to the east. To the south is the Lealt River which predominantly flows in a wide gorge with the Lealt Falls located on the southwestern edge of the Site. Areas of large boulder scree are also present adjacent to the Quarry. Lealt falls are a tourist attraction and the Site includes areas of car parking, footpaths and pic-nic areas.

See Figure 1 for full details of the respective sections of the Site.

2 LEGISLATIVE CONTEXT

All wild birds, their nests and eggs are, with few exceptions, protected under the Wildlife and Countryside Act (WCA). Additional protection is provided to species listed under Annex I of the EC Birds Directive.

2.1 WILDLIFE AND COUNTRYSIDE ACT 1981

All wild birds in the UK are protected under the Wildlife and Countryside Act (WCA) 1981, as amended in Scotland by the Nature Conservation (Scotland) Act 2004. Under this Act, it is and offence to intentionally or recklessly:

- kill, injure or take any wild bird; or
- take, damage, or destroy or otherwise interfere with the nest of any wild bird while that nest is in use or being built; or
- obstruct or prevent any wild bird using its nest;
- take or destroy the egg of any wild bird;
- disturb any wild bird listed on Schedule 1 whilst it is building a nest or is in, on, or near a nest containing eggs or young, or whilst lekking;
- disturb the dependent young of any wild bird listed on Schedule 1; or
- harass any wild bird listed on Schedule 1A

In Scotland, under Schedule 1A of the WCA (as amended), it is an offence to intentionally or recklessly harass at any time any wild bird listed on Schedule 1A, i.e. white-tailed eagle *Haliaeetus albicilla*. Under Schedule A1 of the WCA (as amended), it is an offence to intentionally or recklessly damage, destroy or otherwise interfere with the nest when not in use of any of the above acts to be carried out.

For Schedule 1 and Schedule 1A bird species, a license is required from SNH to carry out activities that may disturb birds while they are building a nest or are in, on or near a nest containing eggs or young, or cause disturbance of the dependent young (Hardey *et al.* 2013).

2.2 EC BIRDS DIRECTIVE

Bird species listed on Annex I of the Council Directive 2009/147/EC on the Conservation of Wild Birds (EC Birds Directive) are “the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution”.

Annex I species are protected from:

- Deliberate killing or capture by any method;
- Deliberate destruction of, or damage to, their nests and eggs or removal of their nests;
- Taking their eggs in the wild and keeping these eggs even if empty;
- Deliberate disturbance of these birds particularly during the period of breeding and rearing, in so far as disturbance would be significant having regard to the objectives of the Directive; and
- Keeping birds of species the hunting and capture of which is prohibited.

2.3 UK BIRDS OF CONSERVATION CONCERN

A number of bird species considered to be of high nature conservation concern are listed in UK Biodiversity Action Plans (UKBAP), with additional species of local concern listed as Local Biodiversity Action Plan (LBAP) species.

The status of all British birds has been analysed by conservation agencies including the RSPB. On the basis of ongoing population trends, species are assigned to one of three lists of UK Conservation Concern (Eaton *et al.* 2015). These are the red list, amber list and green list. Although the lists confer no legal status, they are useful in assessing the significance of impacts and appropriate levels of mitigation that may be required when birds are affected by development or other activity.

The red list comprises 67 species whose populations or range are rapidly declining, (recently or historically), and those of global conservation concern. Several common, but rapidly declining farmland birds are included on the red list, such as Skylark, Song Thrush and Tree Sparrow.

The amber list identifies 96 species that have undergone moderate declines in population and/or range. Birds on the green list are not considered threatened.

The status of a species in the lists of Birds of Conservation Concern (UK BoCC) bears little relationship to the statutory protection afforded it. However, inclusion on the red list is a factor in determining the species for which UK BAPs are developed.

2.4 SCOTTISH BIODIVERSITY LIST

The Scottish Biodiversity List (SBL) is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. By identifying the species and habitats that are of the highest priority for biodiversity conservation, the list helps public bodies carry out their biodiversity duty, but it is a useful resource for anyone interested in nature conservation in Scotland. Currently 105 species of bird are listed on the SBL.

3 METHODOLOGY

3.1 DESK STUDY

A number of information sources were used to obtain ecological background information for the Survey Area and a buffer of 5km. Information on statutory sites was obtained from the website of the statutory agency Scottish Natural Heritage (SNH) via the "Site Link Portal" (http://www.snh.org.uk/snhi/).

A review of information held on the National Biodiversity Network (NBN) Atlas website (www.nbnatlas.org) was also undertaken to provide contextual background information for the location.

Aerial photography, both publically available (e.g. www.bingmaps.co.uk) and through Emapsite (www.emapsite.com) of the Survey Area was also used to guide field surveys.

3.2 RAPTOR SURVEY

Visits were made on 30th April, 3rd June and 5th July 2021 to survey for breeding raptor species across both sites. Within each Survey Area vantage point watches (approximately 2hrs in length) were made over potentially suitable nesting habitat. Watches included moving slowly through the Survey Area with regular stops to assess activity.

3.3 BREEDING BIRD SURVEY

The methodology broadly followed the British Trust for Ornithology Breeding Bird Survey (BBS) guidance and comprised of a number of visits to each of the Survey Areas. For each Survey Area a survey route was designed to ensure that all areas of the Survey Areas were visited to within approximately 100m although this varied considerably across the Survey Areas due to topographical constraints.

BBS bird counts were undertaken on 29th April and 4th June at the Quarry Survey Area and 28th April and 5th June at the Harbour Survey Area. During the survey the location and behavior of all birds encountered was recorded using standard BTO notation as defined in

Bibby et al. (2000). All registrations were mapped on 1:10,000 scale maps within the field. Visits were made in daylight hours and acceptable weather conditions.

3.4 LIMITATIONS

The surveys were undertaken at appropriate time of year under suitable weather conditions. All areas of the site were accessible although a number of areas consisted of very steep ground around the quarry, sea cliffs and gorge cliffs along the Lealt River. As a result some areas were assessed from greater distance than would usually be undertaken using binoculars combined with the surveyor local knowledge and experience. However, taking these factors into account it is assessed that the survey was not subject to any significant limitations.

4 RESULTS

4.1 DESK STUDY

Based on publically available internet resources (NBN Atlas) a number of records exist for within the Survey Areas and surrounding 5km including little auk *Alle alle*, teal *Anas crecca,* Greenland white-fronted goose *Anser albifrons flavirostris*, red-throated diver *Gavia stellata,*: black-throated diver *Gavia arctica* and manx shearwater *Puffinus puffinus*. Other species include common sandpiper *Actitis hypoleucos,* house sparrow *Passer domesticus* and skylark *Alauda arvensis.*

Raptor species within 5km of the Survey Areas include golden eagle *Aquila chrysaetos*, buzzard *Buteo buteo*, merlin *Falco columbarius*, peregrine *Falco peregrinus*, kestrel *Falco tinnunculus* and white-tailed eagle *Haliaeetus albicilla*. Out of the raptors present in the wider area only kestrel is present within 1km of the Harbour Survey Area and barn owl within 1km of the Quarry Survey Area.

In addition, to the records above anecdotal evidence suggested that peregrine may use the cliffs of the Lealt Gorge as a nesting site.

4.2 RAPTOR SURVEY

A summary of the surveys and observations is presented in Table 1. Very few raptors were observed during the raptor surveys as well as the Breeding Bird Surveys. During the three raptor surveys no observations of raptors were recorded within the Quarry Survey Area which included the area around Lealt Gorge. The Staffin Survey Area supported a small number of observations of buzzard which was observed passing through the Site above the cliffs on all three surveys and the presence of a hunting kestrel on the June and July survey visits. Observations of the kestrel included hunting activity around the cliffs at Cadha Riach at the southern end of the Survey Area.

Table 1: Summary of Raptor Survey findings

Visit date	Survey details	Notes
30th April 2021	Walkover sites, short VPs (Quarry: From viewpoint along cliffs, Harbour: From slipway back to cliffs	Quarry: No raptors Harbour: Buzzard above cliffs
3rd June 2021	Walkover sites, short VPs (Quarry: From waterfall viewpoint looking east down river, Harbour: From slipway back to cliffs)	Quarry: No raptors Harbour: Kestrel hunting Cadha Riach, Buzzard Sgeir Bhan)

5th July 2021	Walkover sites, short VPs (Quarry: From top of cliffs NG519606 looking south, Harbour: From slipway car park looking S/SW)	Quarry: No raptors Harbour: Kestrel hunting west of Cadha Riach, Buzzard along cliffs)

4.3 BREEDING BIRD SURVEY

During the course of the breeding bird surveys chaffinch, skylark and meadow pipit were the most common bird species recorded across both sites, but with higher numbers observed on the Quarry Survey Area. Stonechat, wheatear and wren were also commonly observed across the Survey Areas. Other species were recorded more sporadically.

Table 2 displays the species recorded during the course of field surveys. Figures 2 and 3 show the locations of registrations across the respective survey occasions, with Figure 4 detailing an assessment of the probably and potential breeding territories of the species.

The species found across the Survey Areas were typical of the habitats present and supported a small number of red listed species including song thrush at the Quarry Survey Area, herring gull within the Harbour Survey Area and numerous records for skylark across both Survey Areas. Herring gull and skylark are also both on the Scottish Biodiversity List (SBL) along with golden plover, hooded crow, kestrel and song thrush.

Table 2: Species registrations across Survey Areas

Species	Sp. code	Sch.1	Ann.1	UK BoCC List		SBL	Registrations (Quarry)		Registrations (Harbour)	
				Red	Amber		Visit 1	Visit 2	Visit 1	Visit 2
Barn swallow	SL				X		0	2	0	1
Blackbird	B.						0	1	0	1
Blue tit	BT						0	1	0	0
Buzzard	BZ						0	0	1	0
Chaffinch	CH						6	5	0	0
Golden plover	GP				X	X	1	0	0	0
Great black backed gull	GB				X		0	0	0	1
Great skua	NX				X		0	0	1	0
Great tit	GT						1	2	0	0
Herring gull	HG			X		X	0	0	2	0
Hooded crow	HC					X	1	2	0	3
Jackdaw	JD						0	0	1	1
Kestrel	K.				X	X	0	0	0	1
Meadow pipit	MP				X		18	20	4	2
Oystercatcher	OC				X		0	1	2	3
Pied wagtail	PW						1	2	1	1
Redshank	RK				X		0	0	1	0
Robin	R.						2	3	0	0
Rock dove	DV						2	2	2	3
Rock pipit	RC						1	3	3	2
Skylark	S.			X		X	14	12	6	5
Snipe	SN				X		1	0	1	1
Song thrush	ST			X		X	1	1	0	0
Stonechat	SC						3	3	0	0
Wheatear	W.						3	3	1	3
Willow warbler	WW				X		0	2	0	0
Wren	WR						4	2	2	0

5 DISCUSSION

No Annex 1 (EU Birds Directive) or Schedule 1 (Wildlife and Countryside Act 1981) were recorded within the Survey Areas. A number of red and amber list species along with several also listed on the Scottish Biodiversity List were present in relatively low numbers representing a typical distribution of bird species for the area and habitats present.

6 REFERENCES

Bibby, C.J., Burgess, N.D., Hill, D.A. & Mustoe, S.H. (2000) *Bird Census Techniques*, 2nd ed. Academic Press, London.

Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A. & D., G.R. (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. *British Birds*, **108**, 708–746.

Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013) *Raptors: A Field Guide to Survey and Monitoring*, 3rd ed. The Stationery Offices Edinburgh.

APPENDIX A – PHOTOGRAPHS

Plate 1: View across Quarry to south with Lealt Gorge hidden.

Plate 2: View East across edge of quarry towards cliffs.

Plate 3: Areas of open upland habitat north of the Quarry supporting wet heath and bog communities.

Plate 4: View north along shoreline at base of cliffs within Quarry Survey Area.

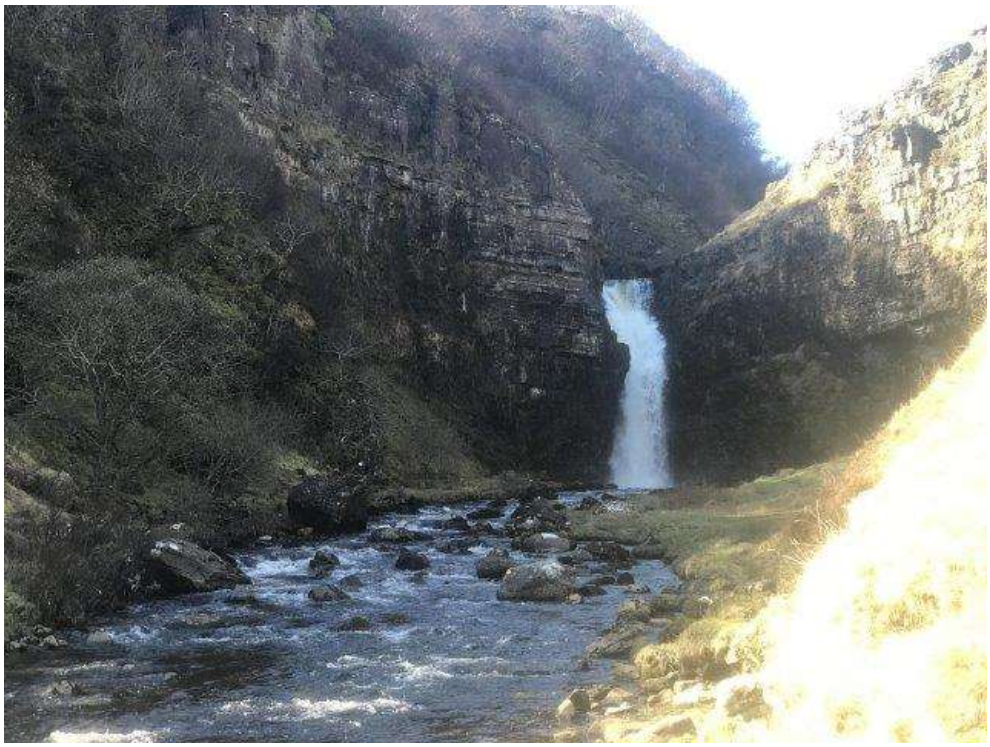

Plate 5: Lealt River Falls with pool beneath and high gorge walls.

Plate 6: View from northern extent of Harbour Survey Area looking south showing cliffs and shallower slopes with boulders.

Plate 7: View from south of Harbour looking north showing low sloping marshy grassland habitats along shoreline.

Plate 8: Typical section of rocky shoreline at low tide showing exposed bedrock near to existing breakwater.

APPENDIX B – FIGURES

151600
151800
152000
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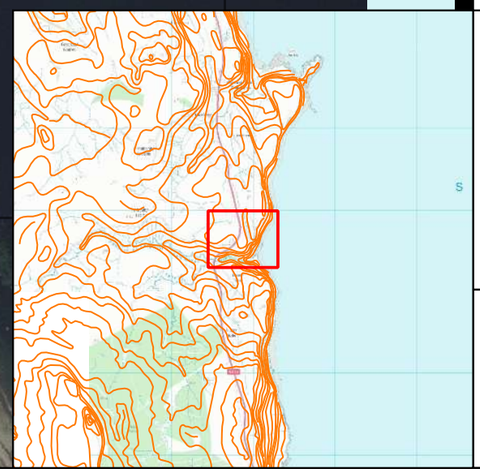
860600
860400

Staffin Harbour Improvements - Quarry

Figure 1a: Ornithological Survey Area

Survey Area
Quarry Planning Boundary
OS 10m contours



TRACKS ecology

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Scale @ A3 - 1:2,500

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Drawing number: T21/018/AFF/009
Revision: 1
Date of production: 2021-07-30
Drawn by: JB - Tracks Ecology
Projection: British National Grid EPSG:27700

149200 149400 149600 149800

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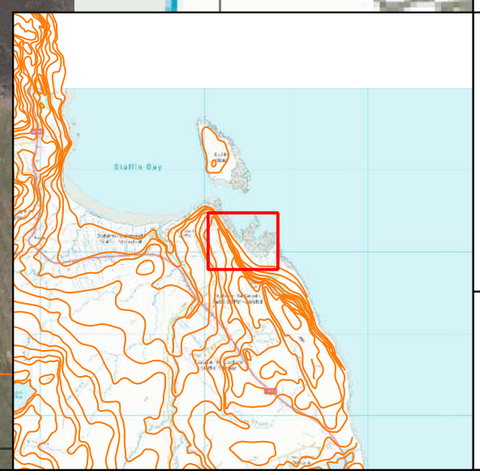
Staffin Harbour Improvements - Harbour

Figure 1b: Ornithological Survey Area

Survey Area
OS 10m contours



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Projection: British National Grid EPSG:27700

Staffin Harbour Improvements - Quarry

Figure 2a: Breeding Bird Survey 1

Species	BTO Code
Barn swallow	SL
Blackbird	B.
Blue tit	BT
Buzzard	BZ
Chaffinch	CH
Golden plover	GP
Great black-backed gull	GB
Great skua	NX
Great tit	GT
Herring gull	HG
Hooded crow	HC
Jackdaw	JD
Kestrel	K.
Meadow pipit	MP
Oystercatcher	OC
Pied wagtail	PW
Redshank	RK
Robin	R.
Rock dove	DV
Rock pipit	RC
Skylark	S.
Snipe	SN
Song thrush	ST
Stonechat	SC
Wheatear	W.
Willow warbler	WW
Wren	WR

Survey Area

Quarry Planning Boundary

OS 10m contours

Species Conservation Status

- Amber
- Green
- Red

Behaviour

- Calling
- Display
- Overflying
- Roost/Colony
- Song

0 40 80 m

Scale @ A3 - 1:2,500

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Drawing number: T21/018/AFF/011
Revision: 1
Date of production: 2021-07-30
Drawn by: JB - Tracks Ecology
Projection: British National Grid EPSG:27700

Staffin Harbour Improvements - Harbour

Figure 2b: Breeding Bird Survey 1

Species	BTO Code
Barn swallow	SL
Blackbird	B.
Blue tit	BT
Buzzard	BZ
Chaffinch	CH
Golden plover	GP
Great black-backed gull	GB
Great skua	NX
Great tit	GT
Herring gull	HG
Hooded crow	HC
Jackdaw	JD
Kestrel	K.
Meadow pipit	MP
Oystercatcher	OC
Pied wagtail	PW
Redshank	RK
Robin	R.
Rock dove	DV
Rock pipit	RC
Skylark	S.
Snipe	SN
Song thrush	ST
Stonechat	SC
Wheatear	W.
Willow warbler	WW
Wren	WR

Survey Area

OS 10m contours

Species Conservation Status

- Amber
- Green
- Red

Behaviour

- Calling
- Display
- Overflying
- Roost/Colony
- Song

0 40 80 m

Scale @ A3 - 1:2,500

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Revision: 1
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Drawn by: JB - Tracks Ecology
Projection: British National Grid EPSG:27700

Staffin Harbour Improvements - Quarry

Figure 3a: Breeding Bird Survey 2

Species	BTO Code
Barn swallow	SL
Blackbird	B.
Blue tit	BT
Buzzard	BZ
Chaffinch	CH
Golden plover	GP
Great black-backed gull	GB
Great skua	NX
Great tit	GT
Herring gull	HG
Hooded crow	HC
Jackdaw	JD
Kestrel	K.
Meadow pipit	MP
Oystercatcher	OC
Pied wagtail	PW
Redshank	RK
Robin	R.
Rock dove	DV
Rock pipit	RC
Skylark	S.
Snipe	SN
Song thrush	ST
Stonechat	SC
Wheatear	W.
Willow warbler	WW
Wren	WR

Survey Area

Quarry Planning Boundary

OS 10m contours

Species Conservation Status

- Amber
- Green
- Red

Behaviour

- Calling
- Display
- Overflying
- Roost/Colony
- Song

0 40 80 m

Scale @ A3 - 1:2,500

Drawing number: T21/018/AFF/013
Revision: 1
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Drawn by: JB - Tracks Ecology
Projection: British National Grid EPSG:27700

Staffin Harbour Improvements - Harbour

Figure 3b: Breeding Bird Survey 2

Affric making it happen

Species	BTO Code
Barn swallow	SL
Blackbird	B.
Blue tit	BT
Buzzard	BZ
Chaffinch	CH
Golden plover	GP
Great black-backed gull	GB
Great skua	NX
Great tit	GT
Herring gull	HG
Hooded crow	HC
Jackdaw	JD
Kestrel	K.
Meadow pipit	MP
Oystercatcher	OC
Pied wagtail	PW
Redshank	RK
Robin	R.
Rock dove	DV
Rock pipit	RC
Skylark	S.
Snipe	SN
Song thrush	ST
Stonechat	SC
Wheatear	W.
Willow warbler	WW
Wren	WR

Survey Area

OS 10m contours

Species Conservation Status

- Amber
- Green
- Red

Behaviour

- Calling
- Display
- Overflying
- Roost/Colony
- Song

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Scale @ A3 - 1:2,500

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Staffin Harbour Improvements - Quarry

Figure 4a: Birds of Conservation Concern

Species	BTO Code
Barn swallow	SL
Blackbird	B.
Blue tit	BT
Buzzard	BZ
Chaffinch	CH
Golden plover	GP
Great black-backed gull	GB
Great skua	NX
Great tit	GT
Herring gull	HG
Hooded crow	HC
Jackdaw	JD
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Rock dove	DV
Rock pipit	RC
Skylark	S.
Snipe	SN
Song thrush	ST
Stonechat	SC
Wheatear	W.
Willow warbler	WW
Wren	WR

Survey Area

Quarry Planning Boundary

OS 10m contours

Bird of Conservation Concern Status

- Amber - Possible breeding
- Amber - Probable breeding
- Red - Possible breeding
- Red - Probable breeding

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Scale @ A3 - 1:2,500

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Drawing number: T21/018/AFF/015
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149200 149400 149600 149800

868400 868200 868000 867800

W. OC S. S. MP OC S. S. W. S. SN S. S. W. S. S.

Species	BTO Code
Barn swallow	SL
Blackbird	B.
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Redshank	RK
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Rock dove	DV
Rock pipit	RC
Skylark	S.
Snipe	SN
Song thrush	ST
Stonechat	SC
Wheatear	W.
Willow warbler	WW
Wren	WR

Staffin Harbour Improvements - Harbour

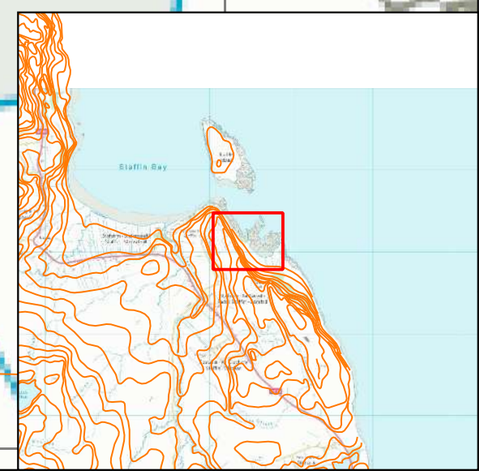
Figure 4b: Birds of Conservation Concern

Survey Area

OS 10m contours

Bird of Conservation Concern Status

- Amber - Possible breeding
- Amber - Probable breeding
- Red - Possible breeding
- Red - Probable breeding



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Scale @ A3 - 1:2,500

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Drawing number: T21/018/AFF/014
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Appendix N.1: Assessment of Environmental Impact of Noise at Lealt Borrow Pit, Skye

Wallace Stone
Consulting Civil Engineers

DAL
DALGLEISH
ASSOCIATES
LIMITED

VIBROCK

Assessment of Environmental Impact of Noise at Lealt Borrow Pit, Skye

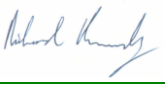
DALGLEISH ASSOCIATES LIMITED

R21.11051/1/AF
Date of Report: 13 April 2021

REPORT DETAILS

Client	Dalgleish Associates Limited
Report Title	Assessment of Environmental Impact of Noise
Site Address	Lealt Borrow Pit, Skye
Report Ref.	R21.11051/1/AF
Vibrock Contact	vibrock@vibrock.com

QUALITY ASSURANCE

Issue No.	Issue Date	Comments	Author	Technical Review
1	13/04/21	n/a	 A Findlay MIOA Consultant	 R Kennedy MIOA Director

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CONTENTS

TABLES

FIGURE

1.0 INTRODUCTION

1.1 The Staffin Community Trust (SCT) is preparing a planning application to improve the existing facilities at the Staffin slipway in Garafad, Staffin and make it fit for purpose by creating a Community Harbour. This will include a slip way extension, pontoon and breakwater construction and improved parking and storage facilities.

1.2 The above works will require various sized rock and aggregates and a possible source for these has been identified at the former Lealt Quarry, some 8 km to the south and accessed directly from the A855.

1.3 The application for planning permission for the re-opening of the quarry as a borrow pit for the Staffin slipway project is being prepared by Dalgleish Associates Limited.

1.4 The use of plant and machinery can, if not properly controlled, increase sound levels in an area. Accordingly, it was considered prudent that a noise assessment of the proposed works at Lealt Borrow Pit be undertaken.

1.5 Vibrock Limited, a national, independent, firm of environmental consultants, has been commissioned by Dalgleish Associates to undertake a noise study of the proposed operations at Lealt Borrow Pit.

1.6 This report details the results of noise predictions to the nearest potentially noise sensitive properties and assesses the impact that the proposed development might have on the local environs.

2.0 SITE DESCRIPTION

2.1 General Environs

2.1.1 The former Lealt Quarry site is located some 1 kilometres to the east of the hamlet of Lealt and, as mentioned previously, immediately adjacent to the east side of A855. The quarry is located between the highway and the coast.

2.1.2 To the south of the quarry access point on the A855 is a car park from which there is a footpath to the Lealt waterfall viewpoint.

2.1.3 The area surrounding the site is mainly rough pasture and moorland.

2.2 Existing Noise Attenuating Features

2.2.1 A working face has been created at the site as a result of the previous workings. This runs generally parallel to the A855. Accordingly, plant working on the quarry floor will benefit from the screening provided by the face.

2.2.2 There are some low-level screening mounds that are also associated with the former workings and these too will provide some additional barrier attenuation to the passage of noise.

2.3 Working Method

2.3.1 No contractor has been appointed as yet to work the borrow pit and therefore the sequence of operations reflects an assumed working method that is based on Dalgleish Associates and Vibrock's considerable experience of mineral workings.

2.3.2 The initial works on site will be the stripping of the material overlying the rock deposit, the material being used to slightly increase the existing mounds at the northern end and western side of the development.

2.3.3 The first stage in the extraction process will be the drilling of blast shot holes, an operation that will take place for two to three days in advance of each blast.

2.3.4 The larger rock in the blast pile, suitable for use as rock armour, will be extracted by an excavator and moved to the armour stone stockpile by loading shovel until required at the slipway site.

2.3.5 Once the above segregation has taken place there may be material that requires to be broken as it would be too large for processing. This size reduction would be undertaken by an excavator mounted hydraulic breaker. The excavator used would most likely be the same plant item that segregated the larger rock from the blast shot pile.

2.3.6 The remaining mineral in the blast pile wold be moved by the loading shovel to the rock processing and storage area. Once a sufficient volume of material had been accumulated mobile plant would be brought to site to prepare crushed aggregates. This would comprise a crusher and, possibly, a screen.

2.3.7 The armour stone and crushed aggregates would be hauled to the slipway site by HGV; the tipper type for the crushed aggregates and flatbed vehicles for the larger armour stone.

3.0 NOISE TERMINOLOGY

3.1 Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air.

3.2 Between the quietest audible sound and the loudest tolerable sound there is a million to one ratio in sound pressure level. It is because of this wide range that a noise level scale based on logarithms is used in noise measurement. This is the decibel or dB scale.

3.3 Audibility of sound covers a range of about 0 to 140 decibels (dB) corresponding to the intensity of the sound pressure level. The ability to recognise a particular sound is dependent on the pitch or frequencies present in the source. Sound pressure measurements taken with a microphone cannot differentiate in the same way as the ear, consequently a correction is applied by the noise measuring instrument in order to correspond more closely to the frequency response of the ear which responds to sounds from 20 Hz to 20000 Hz. This is known as 'A-weighting' and written as dB(A).

3.4 The use of this unit is internationally accepted and correlates well with subjective annoyance to noise.

3.5 The logarithmic basis of noise measurements means that when considering more than one noise source their addition must be undertaken in terms of logarithmic arithmetic. Thus, two noise sources each of 40 dB(A) acting together would not give rise to 40 + 40 = 80 dB(A) but rather 40 + 40 = 43 dB(A). This 3 dB(A) increase represents a doubling in sound energy but would be only just perceptible to a human ear.

3.6 The following table gives typical noise levels in terms of dB(A) for common situations.

Approximate Noise Level dB(A)	Example
0	Threshold of hearing
30	Rural area at night, still air
40	Public library
50	Quiet office, no machinery
60	Normal conversation
70	Inside a saloon car
80	Vacuum cleaner
100	Pneumatic drill
120	Threshold of pain

3.7 Noise levels can vary with time according to source activity and indices have been developed in order to be able to assign a value to represent a period of noise level variations and to correspond with subjective response.

3.8 The L_{Aeq} or A-weighted equivalent continuous noise level index is used to average the noise energy over a period of intermittent noise levels. It is the level of steady sound of equivalent energy and is usually referred to as the ambient noise level.

3.9 The L_{A90} index represents the noise level exceeded for 90% of the measurement period and is used to indicate the quieter sections of the measurement period. It is usually referred to as the background noise level.

3.10 The L_{Amax} index is the maximum root mean square A-weighted noise level occurring during the measurement period.

4.0 NOISE CRITERIA

4.1 Introduction

4.1.1 The ambient environmental noise at any location will vary according to the activities in progress around that location. In the vicinity of a busy motorway, for example, the noise level will remain fairly constant due to the relatively steady noise input from road traffic, whereas the noise level close to a source of high noise over short periods, such as an airport, will vary over a much wider range. It is therefore necessary to consider how to quantify the existing noise levels in an area in order to accurately assess the acceptability of the introduction of a new noise source.

4.1.2 The background noise level, defined as the L_{A90} parameter, represents the noise level exceeded for 90% of a measurement period, or the ninety percentile level. It generally reflects the quieter noise level between noise events and generally ignores the effects of short term higher noise level events.

4.1.3 The fifty and ten percentile levels, L_{A50} and L_{A10}, represent the average noise level and the level exceeded for 10% of the measurement period, respectively. The latter, for example, is commonly used to describe and quantify noise from road traffic.

4.1.4 The equivalent continuous sound pressure level, or L_{Aeq} parameter, is a measure of the average sound energy over a given time period. It will include noise from all contributing sources. Unless the noise level at the receiving point is perfectly steady, the L_{Aeq} will always be higher than the L_{A90} over any one measurement period.

4.2 Planning Advice Note, PAN 50, "Controlling the Environmental Effects of Surface Mineral Workings."

4.2.1 Annex A of the above document entitled "The Control of Noise at Surface Mineral Workings", published in October 1996, is the latest Government advice applicable to the control of noise from surface mineral workings in Scotland.

4.2.2 PAN 50 recommends the setting of absolute values for noise limits, linked to day-time and night-time working periods, defined as 07:00 -19:00 hours and 19:00 – 07:00 hours respectively. It also identifies evening and dawn periods as being typically 19:00 – 22:00 hours and 06:00 – 07:00 (or 08:00) hours respectively.

4.2.3 PAN 50 introduces the concept of a maximum fixed acceptable noise level of 55 dB $L_{Aeq,1h}$ for daytime operation during the working week and states, in paragraph 33, that this is generally found to be a tolerable level. It also introduces a nominal night time limit of 42 dB $L_{Aeq,1h}$.

4.2.4 PAN 50 recommends that these noise limits be set in terms of free-field noise levels. Consequently only free field noise levels are considered in this report. PAN 50 also states in paragraph 30 that "….there should be sufficient flexibility in the guidance on what these limits should be, so that account can be taken of particular circumstances". The particular circumstances are not specified, but would appear to be locations where particularly low or particularly high background ambient levels exist prior to development.

4.2.5 The document also recognises the converse of the above in paragraph 36, where it indicates that in some circumstances, eg in quieter rural areas, the setting of nominal limits lower than those quoted above may be considered. This may be considered for example where the nominal 55 dB $L_{Aeq,1h}$ level is more than 10 dB above the measured background level.

4.2.6 However, in paragraph 37, the document goes on to say that where the daytime background level is below 35 dB(A), a condition limiting operators to a 10 dB(A) increase over the existing background is unduly restrictive and difficult to achieve. The paragraph concludes, "It would not normally be appropriate to require a daytime limit below 45 dB $L_{Aeq,1h}$, as such a limit should prove tolerable to most people in rural areas."

4.2.7 PAN 50 recognises that "open spaces which the public uses for relaxation may be considered to be noise-sensitive in some circumstances". With regard to guideline noise limits the document states that "the limits would not be expected to be as low as at dwellings, and it is suggested that 65 dB $L_{Aeq,1h}$ during the normal working day and 55 dB $L_{Aeq,1h}$ at other times would be reasonable."

4.3 Temporary Sources of High Noise Levels

4.3.1 PAN 50 states in paragraph 41 that "It will often be necessary to raise the noise limits to allow temporary but exceptionally noisy phases in the mineral extraction operation which cannot meet the limits set for routine operations". A prime example would be to allow for the construction of baffle mounds. Other activities which would also merit a temporary raised limit include soils-stripping, removal of spoil heaps and construction of new permanent land forms.

4.3.2 In paragraph 60 of the document it is suggested that 70 dB $L_{Aeq,1h}$ (free field) for periods of up to 8 weeks in a year should be considered by Planning Authorities (PA's) to facilitate this. It also leaves PA's and mineral operators the ability to negotiate trade-offs between shorter periods of time versus higher noise limits and vice versa.

4.4 Other Noise Criteria

BS 8233: 2014 Guidance on sound insulation and noise reduction for buildings

4.4.1 British Standard 8233:2014 provides guidance for sound insulation and noise reduction in buildings. Tables in the document advise on acoustic criteria and limits which are appropriate for various types of space that have different functions. The guidance applies to external noise as it affects the internal acoustic environment from steady sources without a specific character.

4.4.2 For dwellings, the main considerations are; for bedrooms, the acoustic effect on sleep and for other rooms the acoustic effect on resting, listening and communicating. Table 4 in the BS gives desirable ambient noise levels that should not be exceeded. For dwellings the daytime, 07:00 – 23:00 hours, values are between 35 – 40 dB $L_{Aeq,16h}$ depending on the specific use of the room. The guideline value for bedrooms at night-time, 23:00 – 07:00 hours, is 30 dB $L_{Aeq,8h}$.

4.4.3 BS 8233 states that for external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. There is also a recognition that the above guideline values may not be achievable in all circumstances and that a balance between noise and other factors will require to be made.

World Health Organisation: Guidelines for Community Noise, April 1999

4.4.4 This document provides further information on noise and its affects on the community. It states “To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55 dB L_{Aeq} on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50 dB L_{Aeq}. Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development.’

5.0 NOISE LEVEL PREDICTIONS

5.1 Introduction

5.1.1 Noise has been defined as sound which is undesired by the recipient. The effects of noise on the neighbourhood are varied and complicated, including such things as interference with speech communication, disturbance of work, leisure or sleep. A further complicating factor is that in any one neighbourhood some individuals will be more sensitive to noise than others.

5.1.2 A measure that is in general use and is recommended internationally for the description of environmental noise is the equivalent continuous noise level or L_{Aeq} parameter.

5.1.3 In general, the level of noise in the local environs that arises from a development site will depend on a number of factors. The more significant of which are:

(a) The sound power levels (L_{WA}) of the plant or equipment used on site.

(b) The periods of operation of the plant on site.

(c) The distance between the source noise and the receiving position.

(d) The presence or absence of screening effects due to barriers, or ground absorption.

(e) Any reflection effects due to the façades of buildings, etc.

5.2 Prediction Methodology

5.2.1 In order to assist in the noise assessment Cadna 'A' environmental noise prediction software, version 2017, has been used to model the noise emanating from the proposed development.

5.2.2 The noise prediction software has been configured to undertake the noise calculations in accordance with BS 5228-1: 2009 "Code of practice for noise and vibration control on construction and open sites – Part 1: Noise".

5.2.3 BS 5228-1: 2009 incorporates recommendations made in Planning Advice Note (PAN) 50, Annex A, "The Control of Noise at Surface Mineral Workings" which was issued in 1996. PAN 50 proposed several modifications to the 1984 version of BS 5228, the most important ones being the option of calculated barrier shielding rather than estimated shielding, the inclusion of attenuation due to soft ground and angle of view corrections.

5.2.4 The maximum barrier attenuation of 10 dB(A) quoted within BS 5228-1 can be conservative and is recognised as such in section F.2.2.2.1 where it states "High topographical features and specifically designed and positioned noise barriers could provide greater attenuation". Examples of the former are overburden mounds and excavation high walls whilst baffle banks and acoustic fences are examples of the latter.

5.2.5 In order to more accurately estimate the barrier attenuation for this study, the noise prediction software has been configured to undertake barrier attenuation calculations in accordance with Figure F.3 contained within BS 5228-1. This method of calculating barrier attenuation is frequency dependant.

5.2.6 In all noise prediction calculations the soft ground absorption has been set to '1' representing soft ground. Soft ground attenuation, in accordance with the BS 5228 calculation method, has not been included when barrier attenuation is present.

5.3 Plant Complement

5.3.1 A list of plant sound power levels (L_{WA}) from which the noise predictions were made are presented in Table 2. The plant complement is based on information provided. The sound power levels used are either from BS 5228-1, manufacturer's data or from Vibrock's extensive in-house database of sound power levels measured over the years. All measured sound power levels take into consideration where applicable the operation of any reverse warning systems fitted to the plant.

5.4 Noise Prediction Assumptions

5.4.1 The noise prediction exercises are based on a number of assumptions concerning the working of the site. These assumptions are presented as follows:

5.4.2 All predictions have been calculated with the combinations of plant working at the closest point and/or highest topographic level to the prediction location. They are therefore worst-case scenarios which may be of relatively short duration. However, they indicate the maximum L_{Aeq} noise level to which a particular property or group of properties may be exposed during the working of the site. By definition, the worst-case situation may occur intermittently over the lifetime of the site.

5.4.3 For the purposes of this prediction exercise, the above described worst-case situation has been considered at all times, thus operations are assumed to be undertaken at their realistic minimum distances and maximum heights. In this exercise only the major operations have been considered as they are likely to have the most impact on the local environs.

5.4.4 Given that all prediction methods are estimates and that in practice measured levels are invariably lower due to the effects of interactions between such things as meteorological conditions and air absorption, these predicted levels are a reasonable representation of the worst-case predictions assuming ideal meteorological conditions for sound propagation.

6.0 RESULTS

6.1 Typical sound power levels of plant used in the noise predictions are presented in Table 1.

6.2 The predicted worst-case noise levels, calculated using the sound power levels in Table 1, are presented in Table 2.

7.0 DISCUSSION

7.1 Introduction

7.1.1 Table 2 presents the predicted noise levels using the plant and sound power levels given in Table 1. Detailed in Table 2 is an indication as to the difference between the predicted noise levels and the criteria in PAN 50. The prediction locations are shown on Figure 1.

7.1.2 Predictions to the four closest occupied dwellings have been undertaken for the soil / overburden handling operations required to expose the rock to be extracted, with associated construction of the proposed perimeter screening mounds.

7.1.3 Noise predictions for routine working have been calculated to the same receptors during the phased working of the development. The first prediction is for the use of a drill rig, an operation that will occur intermittently and for periods of two to three days before each blast. Included in this prediction, only for Phases 2 and 3 as there would be no material available during Phase 1, is the on-going despatch of materials, at a rate of 4 loads / 8 movements per hour of both rock armour and crushed aggregates.

7.1.4 The next prediction is for the excavator sorting out the blast pile and includes for the use of the loading shovel moving the rock to the relevant stockpile areas. Also included in this prediction is the off-site haulage of materials as described above, but for all three Phases. This is followed by the use of the rock breaker and again despatch is included in the noise predictions.

7.1.5 As described previously, mobile plant will be used to prepare crushed aggregates. The final working scenario prediction for each phase is the use of this equipment and again it includes for the despatch of materials. The results from this scenario are shown both with and without the inclusion of the drill rig where relevant, for example, processing and drilling would not occur simultaneously in Phase 1.

7.1.6 It is possible that material despatch will take place after quarrying has been completed and therefore a prediction for loading and despatch is also included.

7.2 Lealt Falls House

7.2.1 This property is located some 460 metres to the south west of the borrow pit and is positioned immediately east of the A855.

Predicted Operational Noise Levels

7.2.2 Referring to Table 2.1, the predicted level during the temporary operation of soil and overburden stripping with associated mound construction is 39 dB $L_{Aeq,1h}$, significantly below the PAN 50 criterion for such activities; 70 dB $L_{Aeq,1h}$.

7.2.3 As shown on Table 2.1, the range of predicted levels for the various working scenarios considered is 37 – 47 dB $L_{Aeq,1h}$. The only time that the predicted levels exceed the most stringent PAN 50 Annex A requirement is when the drill rig is operating at the same time as processing is taking place during Phase 2 working. As has been noted previously, drilling will be an intermittent activity that will last for 2 to 3 days before each blast. In addition, the level of 47 dB $L_{Aeq,1h}$ is below the 50 dB $L_{Aeq,16h}$ given in the WHO guidance that prevents the majority of people from being moderately annoyed during daytime and also complies with the desirable criterion given in BS 8233 for gardens and patios.

7.2.4 It is possible that material despatch from stockpiles at the borrow pit will occur after quarrying activity has been completed. The predicted level from this is 36 dB $L_{Aeq,1h}$.

7.3 No. 2 Tote

7.3.1 This receptor is slightly further from the borrow pit, by around 20 metres, than the previous receptor considered, but in the same general direction. It is positioned further to the east of the A855, at circa. 80 metres.

Predicted Operational Noise Levels

7.3.2 The removal of soils and overburden, with the material being used to enhance and extend the perimeter screening bunds, is predicted to result in a worst-case noise level of 38 dB $L_{Aeq,1h}$. This level is significantly below the relevant PAN 50 criteria for temporary operations.

7.3.3 The various borrow pit operations, as shown in Table 2.2, are predicted to result in noise levels in the range 37 to 47 dB $L_{Aeq,1h}$, levels which by and large do not exceed the lowest guidance value given in PAN 50 Annex A; 45 dB $L_{Aeq,1h}$. As was the case for Lealt Falls House, the only time the 45 dB $L_{Aeq,1h}$ criterion is exceeded is when drilling takes place at the same time as processing.

7.3.4 A level of 36 dB $L_{Aeq,1h}$ is predicted when despatch of material takes place in isolation.

7.4 No. 10 Culnacnock

7.4.1 This receptor is some 650 metres to the north of the borrow pit and to the east of the A855.

Predicted Operational Noise Levels

7.4.2 The removal of soils and overburden with associated formation of the screening mounds is predicted to result in a received level of 33 dB $L_{Aeq,1h}$, which easily meets the recommended criterion.

7.4.3 Levels of 28 – 39 dB $L_{Aeq,1h}$ are predicted during the working of the borrow pit, the higher levels occurring when processing and drilling take place together. All of these levels do not exceed the most onerous PAN 50 criterion.

7.4.4 The predicted level from despatch operations in isolation is 25 dB $L_{Aeq,1h}$, a level significantly below the recommended 45 dB $L_{Aeq,1h}$ criterion.

7.5 No. 2 Lealt

7.5.1 To the west of the borrow pit is the hamlet of Lealt and No. 2 is the dwelling closest to the development.

Predicted Operational Noise Levels

7.5.2 Referring to Table 2.4, the predicted level during the temporary operation of soil and overburden stripping with associated mound construction is 33 dB $L_{Aeq,1h}$, significantly below the PAN 50 criterion for such activities; 70 dB $L_{Aeq,1h}$.

7.5.3 The various operations that have been considered at the borrow pit, as shown in Table 2.4, are predicted to result in noise levels in the range 29 to 39 dB $L_{Aeq,1h}$, levels which do not exceed the lowest guidance value given in PAN 50 Annex A; 45 dB $L_{Aeq,1h}$. The highest level of 39 dB $L_{Aeq,1h}$ is predicted when drilling takes place during Phase 1.

7.5.4 Material despatch from stockpiles at the borrow pit after quarrying activity has been completed is predicted to result in a received level at this location of 28 dB $L_{Aeq,1h}$.

7.6 Public Spaces

7.6.1 To the south of the proposed borrow pit there is a car park that provides access to a picnic area and a footpath that allows access to the Lealt waterfall viewing area. The footpath runs close to the borrow pit boundary.

Predicted Operational Noise Levels

7.6.2 As has been shown on Table 2 for all receptors considered, many of the highest predicted levels occur when processing and drilling take place together. Considering these operations, the predicted levels at the picnic area and at the waterfall viewing area are 59 and 52 dB $L_{Aeq,1h}$ respectively. Both of these levels are below the suggested 65 dB $L_{Aeq,1h}$ criterion given in PAN 50 Annex A for such locations.

7.6.3 There is a short length of footpath close to the armour stone stockpile area where levels in excess of 65 dB $L_{Aeq,1h}$ do occur. The length where the exceedance occurs is limited to 70 metres. Normal walking pace in the country and on forestry paths, according to the British Heart Foundation; *www.bhf.org.uk/how-you-can-help/events/training-zone/walking-training-zone/walking-faqs*, is 12 minutes per km. Thus the 70 metres would be covered in less than 1 minute as pedestrians walked to and from the waterfall viewpoint.

8.0 CONCLUSIONS

8.1 A series of noise predictions, based upon BS 5228 and PAN 50 and including the assumptions embodied in Section 5, have been made to the four closest residential noise sensitive locations to the site and also to nearby public open spaces. The predicted noise levels have been assessed against criteria in PAN 50.

8.2 It should be noted that, unless otherwise stated, the predicted noise levels within this report refer to worst-case scenarios, when operations are undertaken in their most adverse position to the receptor and therefore have the greatest influence on the noise level at these locations.

8.3 From the results discussed in earlier sections it is apparent that the estimated worst-case noise levels from soil and overburden handling operations, often considered to be the most intrusive if short lived operations on developments of this type, without exception, do not exceed the PAN 50, 70 dB $L_{Aeq,1h}$ temporary operation criterion.

8.4 With the exception of the very short periods of time during the working of Phase 2 when processing and drilling take place simultaneously, the noise levels received at the closest residential properties do not exceed 45 dB $L_{Aeq,1h}$, the lowest limit given in PAN 50.

8.5 The combined received noise level from processing and drilling at the two receptor locations south of the borrow pit will result in a level of 47 dB $L_{Aeq,1h}$, 2 dB(A) above the criterion but easily satisfying the WHO level that prevents the majority of people from becoming moderately annoyed during the daytime; 50 dB $L_{Aeq,16h}$.

8.6 The predicted levels to those public open spaces where people may spend some time, the picnic area and the waterfall viewing point do not exceed the level for these types of locations given in PAN 50 Annex A; 65 dB $L_{Aeq,1h}$.

8.7 There is a short length of footpath between the A855 car park and the viewing point where the noise levels, in the worst-case, will be above 65 dB $L_{Aeq,1h}$. The time that pedestrians en-route to and from the viewpoint will be exposed to these levels will be extremely short, less than a minute in each direction.

8.8 With the exercise of reasonable engineering control over general operations, the proposed activity at Lealt Borrow Pit should be able to be worked within generally accepted noise criteria and for most of the time will comply with the most stringent limit given in PAN 50 Annex A.

9.0 RECOMMENDATIONS

9.1 The following are recommended as positive statements of the maximum noise levels which could be permitted in accordance with PAN 50 Annex A.

9.2 During the normal daytime working hours the free-field Equivalent Continuous Noise Level ($L_{Aeq,1h}$) for the period due to site operations, excluding soil and overburden handling activity and other works in connection with landscaping, at Lealt Borrow Pit shall not exceed 50 dB free field as recorded at any existing property.

9.3 Soil and overburden handling and other works in connection with landscaping shall not exceed 70 dB $L_{Aeq,1h}$ free field at any existing property and be limited to a period not exceeding 8 weeks, at any one property, in any calendar year.

10.0 REFERENCES

1. Planning Advice Note (PAN) 50, Annex A: The Control of Noise at Surface Mineral Workings.

2. British Standard 5228 Part 1: 2009 Code of practice for noise and vibration control on construction and open sites. British Standards Institution, 2009.

3. British Standard 7445-1:2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures. British Standards Institution, 2003.

4. British Standard 8233: 2014 Guidance on sound insulation and noise reduction for buildings. British Standards Institution, February 2014.

5. Guidelines for Community Noise, World Health Organisation.

6. Calculation of Road Traffic Noise. Department of Transport, Welsh Office HMSO.

7. "The Control of Noise at Surface Mineral Workings" W S Atkins Report on behalf of the Department of Environment, 1990.

INDEX TO TABLES

TABLE 1

List of Plant and Sound Power Levels for Operations at Lealt Borrow Pit

Plant Description	Quantity	Sound Power Level dB(A)
Soil and Overburden Handling		
Excavator	1	106
Articulated dump truck	1	111
Routine Operations		
Excavator	1	106
Excavator sorting blast pile	1	112
Excavator c/w breaker	1	118
Wheeled loading shovel	1	107
Wheeled loading shovel filling HGVs	-	110
Crusher	1	118
Screen	1	116
Road lorry	8 loads per hour	105

TABLE 2

Table 2.1

Summary of Worst-case Predicted Noise Levels at Lealt Borrow Pit

Location No. 1: Lealt Falls House

Description of Operation	Predicted Worst-case dB $L_{Aeq,1h}$	Difference dB(A) PAN 50 criteria
Soil and overburden handling and mound construction	39	-31
Phase 1 drilling	44	-1
Phase 1 sorting and despatch	42	-3
Phase 1 rock breaking and despatch	43	-2
Phase 1 processing and despatch	45	0
Phase 2 drilling and despatch	42	-3
Phase 2 sorting and despatch	38	-7
Phase 2 rock breaking and despatch	37	-8
Phase 2 processing and despatch	41	-4
Phase 2 processing, despatch and drilling	47	+2
Phase 3 drilling and despatch	40	-5
Phase 3 sorting and despatch	38	-7
Phase 3 rock breaking and despatch	38	-7
Phase 3 processing and despatch	41	-4
Phase 3 processing, despatch and drilling	43	-2
Despatch only	36	-9

PAN 50 Criteria	Soil Handling	70 dB $L_{Aeq,1h}$
	Routine Operations	45 dB $L_{Aeq,1h}$

Table 2.2

Summary of Worst-case Predicted Noise Levels at Lealt Borrow Pit

Location No. 2: No. 2 Tote

Description of Operation	Predicted Worst-case dB $L_{Aeq,1h}$	Difference dB(A) PAN 50 criteria
Soil and overburden handling and mound construction	38	-32
Phase 1 drilling	43	-2
Phase 1 sorting and despatch	42	-3
Phase 1 rock breaking and despatch	44	-1
Phase 1 processing and despatch	45	0
Phase 2 drilling and despatch	44	-1
Phase 2 sorting and despatch	38	-7
Phase 2 rock breaking and despatch	37	-8
Phase 2 processing and despatch	42	-3
Phase 2 processing, despatch and drilling	47	+2
Phase 3 drilling and despatch	41	-4
Phase 3 sorting and despatch	38	-7
Phase 3 rock breaking and despatch	39	-6
Phase 3 processing and despatch	42	-3
Phase 3 processing, despatch and drilling	44	-1
Despatch only	36	-9

PAN 50 Criteria	Soil Handling	70 dB $L_{Aeq,1h}$
	Routine Operations	45 dB $L_{Aeq,1h}$

Table 2.3

Summary of Worst-case Predicted Noise Levels at Lealt Borrow Pit

Location No. 3: No. 10 Culnacnock

Description of Operation	Predicted Worst-case dB $L_{Aeq,1h}$	Difference dB(A) PAN 50 criteria
Soil and overburden handling and mound construction	33	-37
Phase 1 drilling	35	-10
Phase 1 sorting and despatch	30	-15
Phase 1 rock breaking and despatch	30	-15
Phase 1 processing and despatch	38	-7
Phase 2 drilling and despatch	30	-15
Phase 2 sorting and despatch	28	-17
Phase 2 rock breaking and despatch	29	-16
Phase 2 processing and despatch	33	-12
Phase 2 processing, despatch and drilling	39	-6
Phase 3 drilling and despatch	31	-14
Phase 3 sorting and despatch	28	-17
Phase 3 rock breaking and despatch	28	-17
Phase 3 processing and despatch	33	-12
Phase 3 processing, despatch and drilling	35	-10
Despatch only	25	-20

PAN 50 Criteria	Soil Handling	70 dB $L_{Aeq,1h}$
	Routine Operations	45 dB $L_{Aeq,1h}$

Table 2.4

Summary of Worst-case Predicted Noise Levels at Lealt Borrow Pit

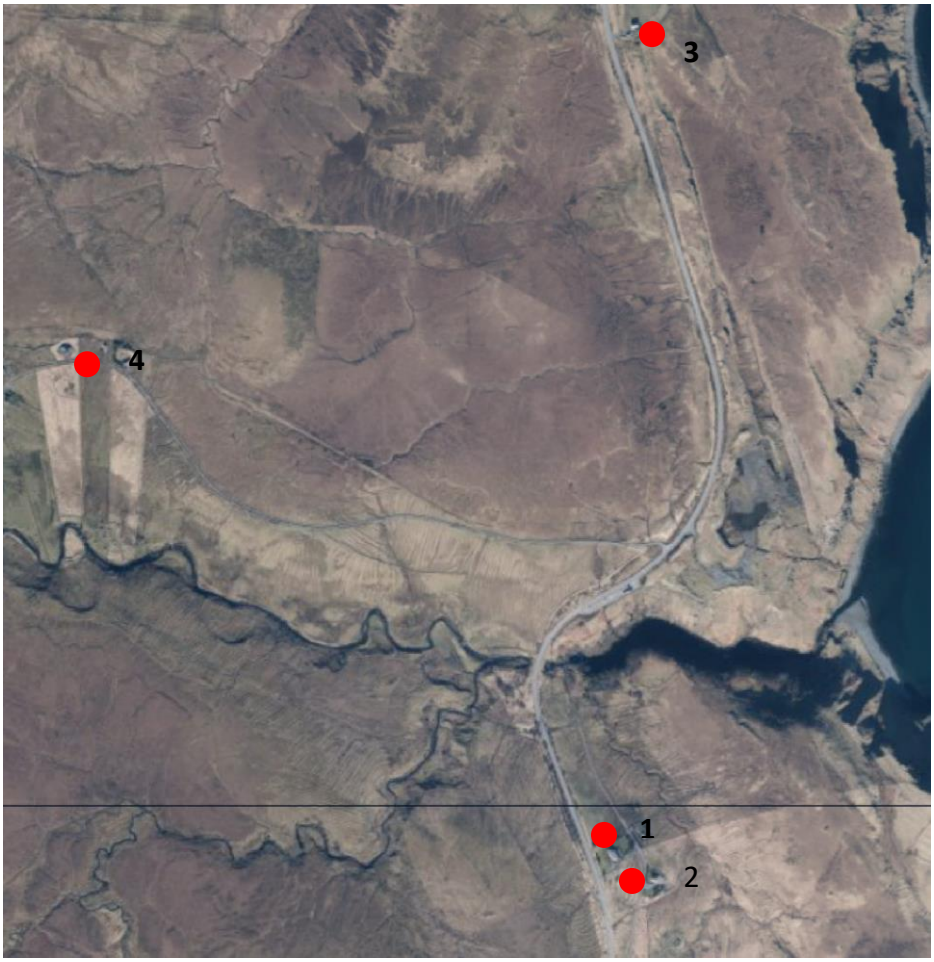
Location No. 4: No. 2 Lealt

Description of Operation	Predicted Worst-case dB $L_{Aeq,1h}$	Difference dB(A) PAN 50 criteria
Soil and overburden handling and mound construction	33	-37
Phase 1 drilling	39	-6
Phase 1 sorting and despatch	33	-12
Phase 1 rock breaking and despatch	32	-13
Phase 1 processing and despatch	36	-9
Phase 2 drilling and despatch	35	-10
Phase 2 sorting and despatch	30	-15
Phase 2 rock breaking and despatch	30	-15
Phase 2 processing and despatch	32	-13
Phase 2 processing, despatch and drilling	38	-7
Phase 3 drilling and despatch	32	-13
Phase 3 sorting and despatch	29	-16
Phase 3 rock breaking and despatch	30	-15
Phase 3 processing and despatch	32	-13
Phase 3 processing, despatch and drilling	34	-11
Despatch only	28	-17

PAN 50 Criteria	Soil Handling	70 dB $L_{Aeq,1h}$
	Routine Operations	45 dB $L_{Aeq,1h}$

FIGURE 1

Noise Receptors



Receptors

1	Lealt Falls House
2	No. 2 Tote
3	No. 10 Culnacnock
4	No. 2 Lealt

Appendix O.1: Transport Assessment

Wallace Stone
Consulting Civil Engineers

DAL
DALGLEISH
ASSOCIATES
LIMITED

Pell Frischmann

Staffin Slipway

Transport Assessment

September 2021

Report Ref.		**Document1**				
File Path		**Document1**				
Rev	**Suit**	**Description**	**Date**	**Originator**	**Checker**	**Approver**
		Transport Assessment - issue	01/09/2021	E Moran	G Buchan	G Buchan

Ref. reference. Rev revision. Suit suitability.

Prepared for

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Contents

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Appendices

1 Introduction

1.1 Purpose of the Report

Pell Frischmann (PF) has been commissioned by Affric Limited to undertake a Transport Assessment (TA) in support if a proposed upgrade of the existing Staffin Slipway by developing the Staffin Community Harbour on the Isle of Skye, approximately 17 miles to the north of Portree. The location of the site (within red circle) in context of Skye is shown in Figure 1.

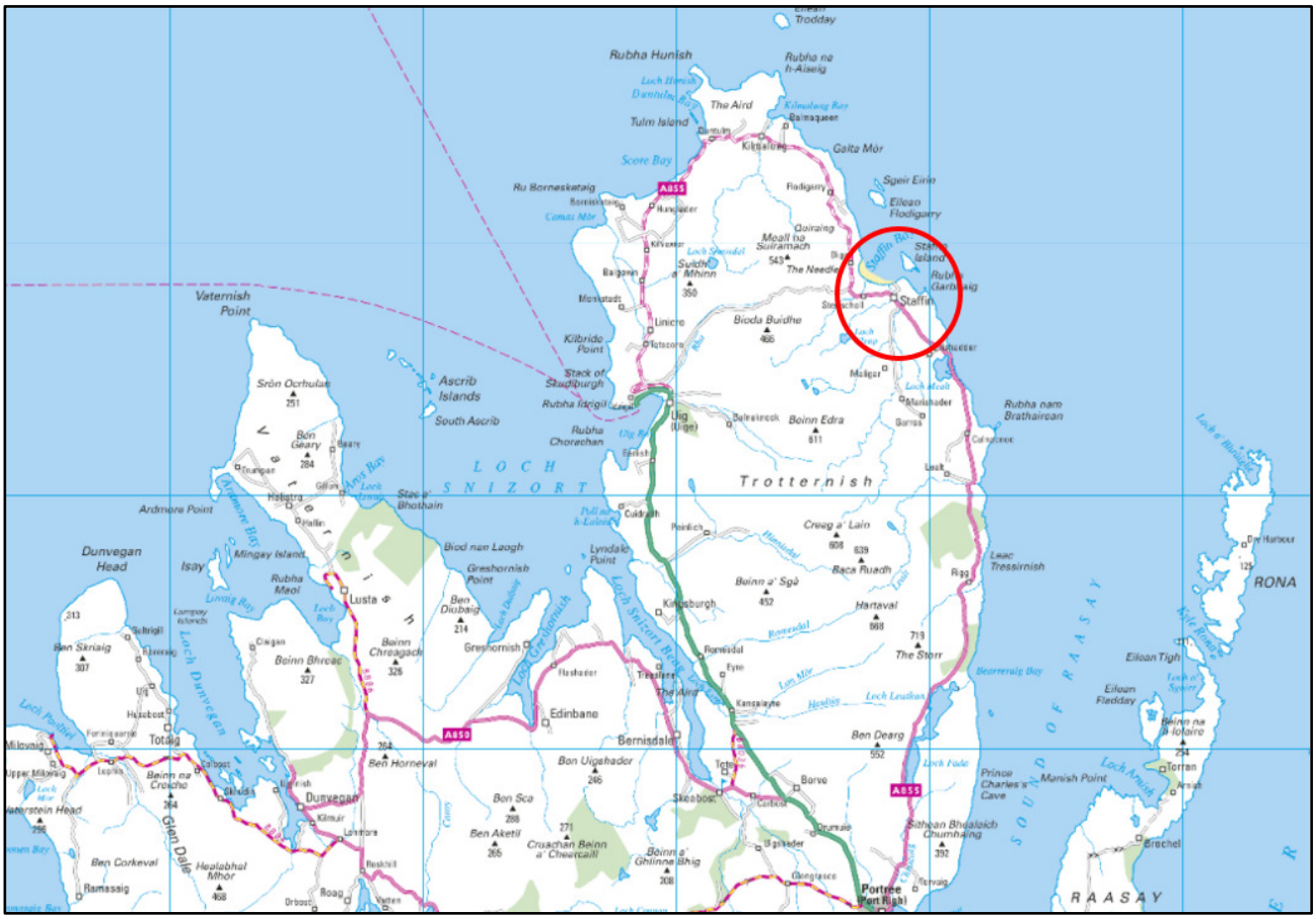

Figure 1 Site location in context of the Isle of Skye (courtesy of Google Maps)

The report identifies the key transport and access issues associated with the proposed development, including the route for the delivery of construction materials. The TA identifies where the proposal development may require mitigation works to accommodate predicted traffic; however, the detailed design of these remedial works is beyond the agreed scope of this report.

1.2 Development Proposals

The proposed development will comprise the following elements:

- an upgrade to the existing slipway;
- construction of a new breakwater;
- installation of pontoon;
- construction of approximately seven storage sheds;
- construction of toilet facilities;
- delivery of access improvements and ancillary infrastructure; and
- provision of parking facilities;

It is proposed that any required rock materials for use in the breakwater will be sourced from the nearby Lealt quarry to the south of the site, via the A855.

This TA has been prepared to review and explain the transport and access issues relating to the proposed development.

This report provides information on the transport planning aspects of the development, providing supplementary information to assist on the determination of a planning application.

1.3 Structure of the Report

Following this introduction, the report will examine the following subject areas:

- Chapter Two describes the Proposed Development;
- Chapter Three reviews the relevant transport and planning policies;
- Chapter Four sets out the methodology used within this assessment;
- Chapter Five describes the baseline transport conditions;
- Chapter Six describes the trip generation and distribution of traffic in the study area;
- Chapter Seven summarises the traffic impact assessment;
- Chapter Eight considers mitigation proposals for development related traffic within the study network;
- Chapter Nine summarises the findings of the TA and outlines the key conclusions.

2 Site Background

2.1 Site Location

The proposed development is located at the Staffin Slipway in Garafad, Staffin in the north-east of Skye. The location of the site is shown in Figure 2.

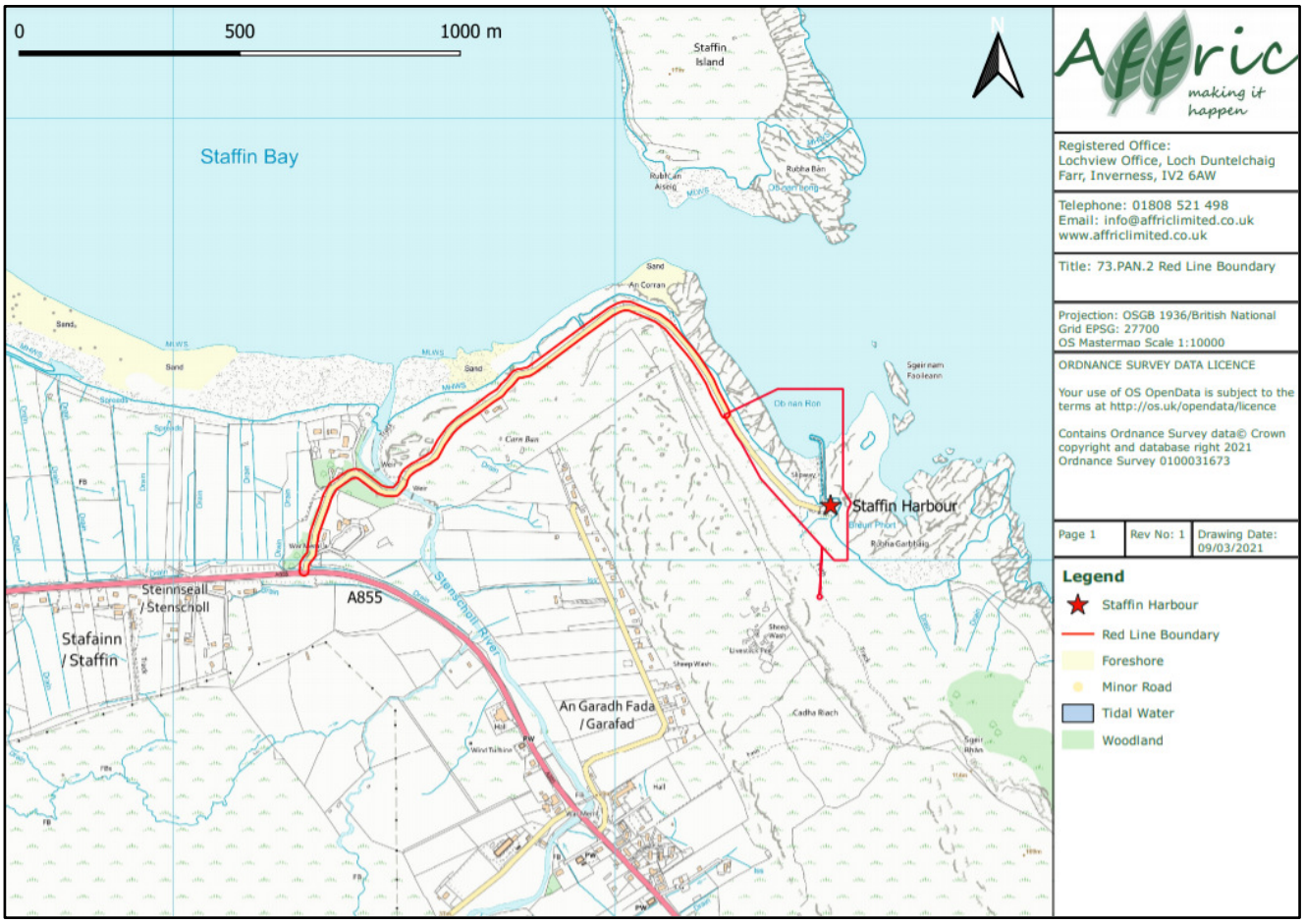

Figure 2 Site Location (courtesy of Affric Limited)

2.2 Current Land Uses

The existing slipway is located to the south of Staffin Bay in the waters which are bounded by Staffin Island to the north. It is adjacent to An Corran beach which is renowned for the presence of dinosaur footprint specimens. There are steep coastal cliffs located to the west of the site and a small open coastal plain to the south.

The existing facilities provided at Staffin Slipway are limited. The existing slipway lacks shelter to protect vessels entering and exiting the pier and has limited opportunities for berthing. There are no basic amenities such as water, fuel or power supply. Boat storage facilities have become dilapidated and are no longer fit for purpose.

The existing site features a small car park for visitors and slipway users. The site is accessed from the A855 via a narrow single-track road with passing places located along its length. The track is approximately 3m wide and is maintained by The Highland Council.

2.3 Proposed Development

The proposed development will comprise the following:

- **Construction of a new slipway** – a 10m wide slipway with a gradient of 1:9 with all-weather shelter will be constructed to the east of the existing slipway.
- **An upgrade to the existing slipway** – the existing slipway will be retained. Provision for berthing on the east side of the slipway will be made by removal of the existing breakwater (the material from which will be used on the new breakwater). The slipway may be extended by up to 15m to allow berthing at low water springs. ;
- **Construction of a new breakwater and installation of a pontoon** – a pontoon with approximately 15 large berths will be installed to enable additional berthing as well as boat storage. A breakwater is required to be constructed to provide protection to the pontoon. It is proposed that the breakwater will be approximately 180m in length;
- **Parking** – a total of 38 vehicle parking spaces will be included in the design, which will include two disabled parking bays;
- **Storage** – approximately seven storage sheds will be constructed to accommodate the onshore storage of boats and equipment;
- **Access tracks** – access to the pontoons will be included in the design;
- **Facilities** – office and public toilet facilities will be provided as part of the proposed development; and
- **Road** – access to Staffin Community Harbour will be via the existing access road. It is proposed that some minor alterations to improve safety will be undertaken as part of the development. Further details are provided in Section 7.3.

Rock armour will be required to be sourced in order to construct the new breakwater. It is proposed that the existing Quarry at Lealt is re-opened for rock extraction. The Quarry is located approximately 8.7 km to the south of the proposed development.

3 Transport Policy Review

3.1 Introduction

An overview of relevant transport planning policies has been undertaken and is summarised below for national and local government policies.

3.2 National Policy

3.2.1 Scottish Planning Policy

The purpose of the Scottish Planning Policy (SPP) is to set out national planning policies which reflect Scottish Ministers' priorities for operation of the planning system and for the development and use of land. The SPP promotes consistency in the application of policy across Scotland whilst allowing sufficient flexibility to reflect local circumstances. It directly relates to:

- The preparation of development plans;
- The design of development, from initial concept through to delivery; and
- The determination of planning applications and appeals.

In 2014, the Scottish Government reissued the Scottish Planning Policy, outlining a framework for delivering improved integration of transport and land use planning. Under the Development Planning section, it states that: 'Development plans should take account of the relationship between land use and transport and particularly the capacity of the existing transport network, environmental and operational constraints, and proposed or committed transport projects.'

In relation to supporting business and employment, the SPP states that the planning system should:

- *promote business and industrial development that increases economic activity while safeguarding and enhancing the natural and built environments as national assets;*
- *allocate sites that meet the diverse needs of the different sectors and sizes of business which are important to the plan area in a way which is flexible enough to accommodate changing circumstances and allow the realisation of new opportunities; and*
- *give due weight to net economic benefit of proposed development.*

The SPP also clarifies that travel plans should identify active travel networks and promote opportunities for travel by more sustainable methods. This is determined by utilising the following order of priority: walking or wheeling, cycling, public transport, cars and other private motorised vehicles.

3.2.2 National Planning Framework 3 (2014)

Scotland's National Planning Framework (NPF3) sets the context for development planning in Scotland and provides a framework for the spatial development of Scotland as a whole. It sets out the Scottish Government's development priorities over the next 20 to 30 years and identifies national developments which support the development strategy. Scotland's third NPF was laid in the Scottish Parliament on 23 June 2014.

3.2.3 National Transport Strategy (NTS2)

In 2020, the Scottish Government released an updated version of the 2006 National Transport Strategy. NTS2 is noted as being:

"…a Strategy for the whole transport system (people and freight) and it considered why we travel and how those trips are made, by including walking, wheeling, cycling, and travelling by bus, train ,ferry, car lorry and aeroplane. It is a Strategy for all users: those travelling to, from and within Scotland."

In relation to island communities, the NTS2 notes that:

"Island communities face similar issues to those living in remote and rural areas, but in many cases the challenges can be greater.

Island communities can also face additional freight costs, such as getting goods, including farming and seafood produce, to market or importing energy sources or building materials and labour."

3.2.4 Planning Advice Note (PAN 75)

Planning Advice Note (PAN) 75: Planning for Transport provides advice on the requirements for Transport Assessments. The document notes that:

"… transport assessment to be produced for significant travel generating developments. Transport Assessment is a tool that enables delivery of policy aiming to integrate transport and land use planning."

"All planning applications that involve the generation of person trips should provide information which covers the transport implications of the development. The level of detail will be proportionate to the complexity and scale of the impact of the proposal...For smaller developments the information on transport implications will enable local authorities to monitor potential cumulative impact and for larger developments it will form part of a scoping exercise for a full transport assessment. Development applications will therefore be assessed by relevant parties at levels of detail corresponding to their potential impact."

3.2.5 Transport Assessment Guidance (2012)

Transport Scotland's (TS) Transport Assessment Guidance was published in 2012. It aims to assist in the preparation of Transport Assessments (TA) for development proposals in Scotland such that the likely transport impacts can be identified and dealt with as early as possible in the planning process. The document sets out requirements according to the scale of development being proposed.

The document notes that a TA will be required where a development is likely to have significant transport impacts but that the specific scope and contents of a TA will vary for developments, depending on location, scale and type of development.

3.3 Local Policy

3.3.1 West Highland and Islands Local Development Plan (WestPlan)

Within WestPlan's Skye and Raasay Settlements note that placemaking priorities for Staffin include:

"Support improvements to harbour facilities, including the slipway and breakwater to provide greater depth and protection for harbour users."

3.3.2 Guidance on the Preparation of Transport Assessments (2014)

THC has prepared guidance on how Transport Assessments (TA) should be prepared for development sites within The Highlands. The guidance was published by THC in November 2014.

This TA has noted the guidelines and has provided the required assessment.

3.3.3 Roads and Transport Guidelines for New Developments (2013)

THC document outlines the guidance and standards for the provision of infrastructure within the council area which includes the design and construction of all new roads associated with development proposals.

The guidance document notes that a TA is required for all developments that will have significant transport impacts. The document notes that the TA should be:

"…comprehensive and consistent review of all of the potential transport impacts arising from a proposed development. The document should clearly set out the developers assumptions and how conclusions and recommendations have been reached. The TA should provide a balanced view of the proposed development, considering both positive and negative impacts."

4 Study Methodology

4.1 Introduction

There are two phases of the life of the proposed development. Both phases have been considered in this assessment and are as follows:

- The Construction Phase; and
- The Operational Phase

4.2 Project Phases – Transport Overview

Of the two phases, the construction phase is considered to have the greatest impact in terms of transport, Construction plant and bulk materials will be transported to the site, may potentially have a significant increase in traffic on the study network.

The operational phase commences once the Proposed Development is fully operational. The proposed volumes of traffic which are anticipated to be associated with the Proposed Development are not considered to be in excess of daily traffic variation levels on the road network at peak travel times.

It should be noted that the construction effects are short lived and transitory in nature, whilst the operational phase assessment has been assumed to be based on typical daily movements once the Proposed Development is fully opened.

5 Baseline Conditions

5.1 Introduction

A review of site accessibility for all modes of transport has been reviewed in a hierarchical manner in accordance with good practice.

5.1.1 Pedestrian Access

As standard with single track roads, there are no footways along Staffin Road / the access track towards the site.

A review of The Highland Council's Core Path plan has been undertaken and this indicated that there is one Core Path located in the immediate vicinity of the proposed development which is shown in Figure 3 and is illustrated by purple lines.

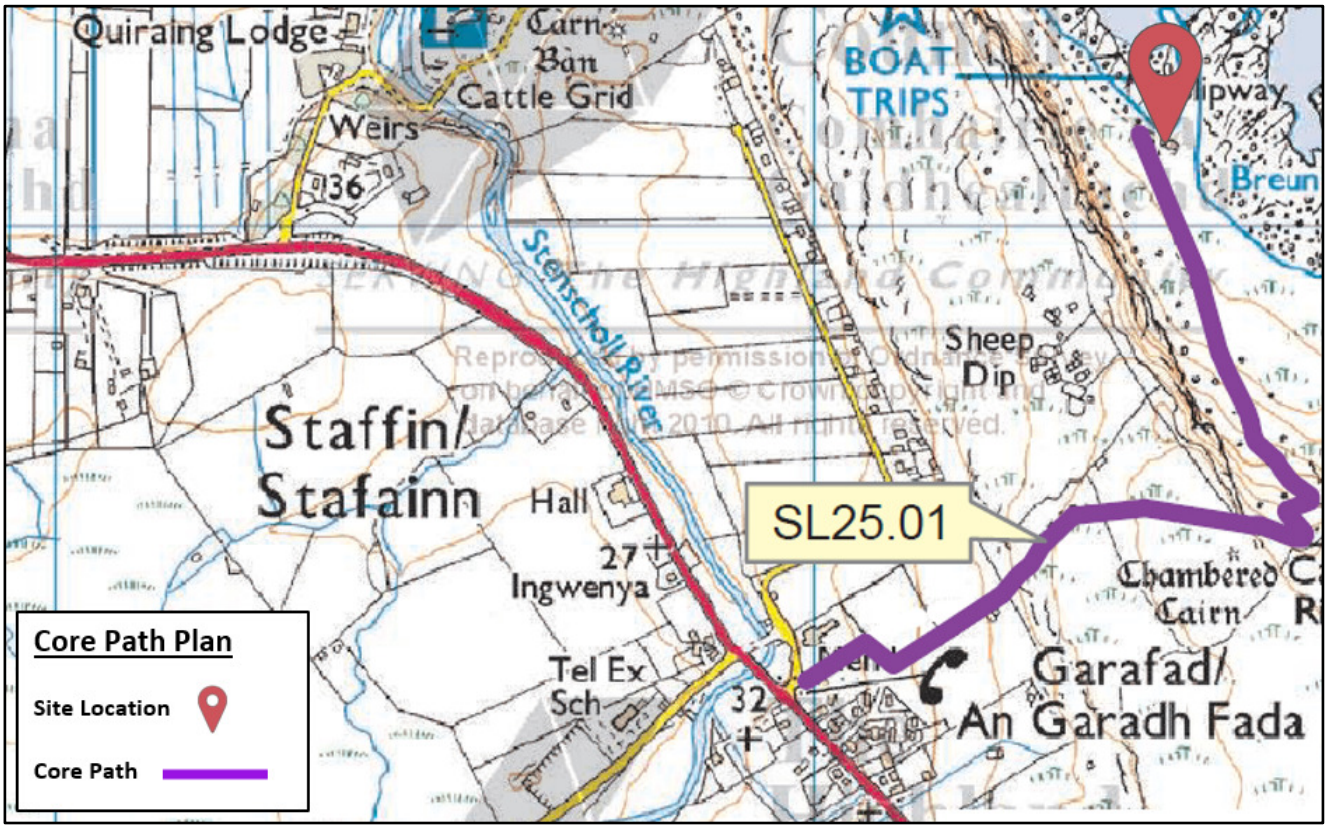

Figure 3 Core Paths in the vicinity of the Site (courtesy of The Highland Council)

Figure 3 shows that start of Core Path SL25.01 is located near the site and provides a connection from Staffin Slipway to Staffin Village. Core Path SL25.01 is a constructed path, recently upgraded by Staffin Community Trust, which is 1.4km in length. Access to this Core Path will not be compromised by the proposed development.

5.1.2 Cyclist Access

A review of the Sustrans cycle map indicates that the A855 is not a recognised part of the National Cycle Route (NCR) network. The roads in the vicinity of the site are generally lightly trafficked and are therefore considered suitable for cycling.

5.1.3 Public Transport Access

There is no public transport provision in the vicinity of the site. The nearest bus stops to the site are located near the Community Centre which approximately 1.5km walking distance from the site.

Table 1: Public Transport Provision

Route Number	Route Description	Operator	Frequency		
			Mon - Fri	**Sat**	**Sun**
57A	Portree High School – Staffin Community Centre – Portree Square	Stagecoach	Six daily services First service at 07:25 and final service at 18:20	Two Services 12:40 and 14:45	No Service
57C	Portree Square – Staffin Community Centre – Portree High School	Stagecoach	Seven daily services First service at 08:05 and final service at 19:06	Two Services 08:16 and 18:41	No Service

5.1.4 Road Access

The Proposed Development would take access directly from the existing unclassified road connecting the slipway with the A855 by means of a priority junction. The access road comprises passing places along its length.

Rock materials will be sourced from a nearby quarry in Lealt which is accessed via the A855.

The A855 is a two-way single carriageway which is subject to the national speed limit in the vicinity of the junction with the access track that leads to Staffin Slipway. There is a footway located along the western boundary of the carriageway that leads to Staffin.

The speed limit of the A855 reduces to 40mph through the settlement of Staffin to the south of the access junction.

The A855 between Staffin and Lealt is as local distributor road subject to the national speed limit. There are no footways along its length.

5.1.5 Existing Traffic Conditions

Due to travel restrictions associated with the Covid 19 outbreak, the collection of meaningful traffic count data within a neutral flow period has not been possible. While historic traffic count data for locations along the A855 and A87 is available from the UK Department for Transport (DfT) database website, there is no existing traffic data along Staffin Road towards the slipway. The baseline flow for Staffin Road has therefore been estimated based on the number of properties along the road, an estimation of pier / tourist uses and car parking capacity.

Staffin Road Estimation

Residential Trip Estimation

A review of Google Maps has indicated that there are 12 residential properties which are accessed via Staffin Road. In order to estimate traffic flows associated with these properties, the TRICs database was interrogated. Trip rates for Land Use: Residential – Houses Privately Owned were forecast based on the following criteria:

- Greater London and South East deselected and Ireland included;
- Only Neighbourhood Centre sites considered; and
- Site which included high public transport provision (greater than 120 services between 07:00 -19:00).

The TRICS outputs (contained in Appendix A) forecast a daily two-way trip-rate per dwelling. While the trip rate is based on a calculation between 07:00 and 19:00, it is assumed that the majority of trips would occur between these times and so it is assumed that this will equate to the daily 24-hour trip rate.

The estimation of the trips associated with the existing houses is presented in Table 2.

Table 2: Residential – Houses Privately Owned Trip Estimations

	Daily Trip Rate			Daily Number of Trips		
Location	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Staffin Road (12 houses)	2.033	2.057	4.090	24	25	49

*Variances Due to Rounding

Table 2 suggests that the daily number of trips associated with the 12 houses along Staffin Road is 49 two-way trips.

Staffin Harbour Estimation

In order to estimate trips associated with the existing slipway, the TRICS Database was interrogated. The section containing Land Use: Marinas was analysed and sites that included over 100 berths were excluded from the assessment. It should be noted that the surveys included in the TRICS assessment sites were undertaken at the weekend. For the purpose of this assessment it is assumed that the weekend trips would equate to weekday trips.

The calculation of the trips is based on car parking spaces. It is estimated that there is space for approximately 10 vehicles at the existing Staffin Slipway.

The estimation of the trips associated with the Staffin Slipway is presented in Table 3.

Table 1: Existing Slipway (Marina) – Trip Estimations

	Daily Trip Rate			Daily Number of Trips		
Location	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Existing Staffin Slipway (10 parking spaces)	0.843	0.858	1.701	8	9	17

*Variances Due to Rounding

Table 3 suggests that the daily number of trips associated with the existing Staffin Slipway is a total of 17 trips.

Tourist Uses Estimation

There is no information available which provides information regarding the number of visitors to An Corran Beach. For the purposes of this exercise, it is assumed that a combined total of 20 arrival and departure trips per day will be associated with this attraction.

Total Estimated Daily Traffic Along Staffin Road

It is therefore estimated that the total traffic travelling along Staffin Road comprises residential, pier and tourist traffic which totals 86 two-way vehicle trips per day. It is assumed that all of this traffic will mostly comprise Cars & LGVs and two of the trips will comprise HGVs for refuse collection.

Department for Transport Traffic Statistics

The counts sites which were used to estimate traffic levels along roads which would be used by traffic associated with the Proposed Development are as follows:

- DfT Site 40945, A855, located near the Rigg south of Lealt Quarry; and
- DfT Site 1131, A87, south of Portree.

This site was identified as being in an area where sensitive receptors on the construction access route would be located. A full receptor sensitivity and effect review is prepared in the Transport and Access Chapter of the EIA Report.

These sources have been factored to provide future year traffic flows using Low Growth National Road Traffic Forecasts (NRTF) to a 2021 baseline (2019/2021 = 1.016).

The traffic count data allowed the traffic flows to be split into vehicle classes and the data have been summarised into cars / light goods vehicles (LGV) and heavy goods vehicles (HGVs) (all goods vehicles >3.5 tonnes gross maximum weight).

Existing Traffic Flows

Table 4 summarises the 24-hour average daily traffic data collected at the count sites.

Table 4: 2021 Baseline Traffic Data

Survey Location	Cars & LGV	HGV	Total
Staffin Road	84	2	86
A855, south of Lealt Quarry	845	36	881
A87, south of Portree	3,940	137	4,077

5.1.6 Local Facilities

There are a number of local facilities in Staffin which is approximately one mile from the site which includes various local shops, hotel, restaurants and a primary school.

5.1.7 Accident Data

The CrashMap website has been reviewed to determine any trends with regards to road-user safety in the vicinity of the site. CrashMap uses data collected by the police about road traffic crashes occurring on British roads where someone is injured.

Analysis of the CrashMap website showed that there were no recorded accidents along the section of the A855 between Portree and the site over the latest three-year period between 2018 and 2020.

A summary of the recorded accidents indicates that:

- Five accidents were recorded along the A855 between Portree Village and the Site of which four were classified as ‘Slight’ and one was classified as ‘Serious’;
- One of the accidents involved a bus and resulted in four casualties which were recorded as ‘Slight’; and
- One of the accidents was recorded as ‘Serious’. The accident, involving one car, occurred near the parking area at Loch Leathan, and resulted in one casualty.

The data from CrashMap does not suggest any apparent trend in relation to accidents on the local road network.

5.1.8 Baseline Traffic Conditions

Construction of the project could commence during 2022 (likely to continue through into 2023) if consent is granted and is anticipated to take up to 12 months depending on weather conditions and ecological considerations. To provide a robust assessment scenario, it is assumed that the base year for assessments will be 2023.

To assess the likely effects during the construction and typical operational phase, base year traffic flows were determined by applying a National Road Traffic Forecast (NRTF) low growth factors to the baseline traffic flows (2021/2023 = 1.011 for Staffin Road and 2019/2023 = 1.027 for the A855 and A87). These factors were applied to the 2019 survey data to estimate the 2023 baseline traffic flows shown in Table 5. This will be used in the Construction Peak Traffic Impact Assessment.

Table 5: 2023 Baseline Traffic Data

Survey Location	Cars & LGV	HGV	Total
Staffin Road	85	2	87
A855, south of Lealt Quarry	854	36	890
A87, South of Portree	3,983	139	4,121

6 Trip Generation and Distribution

6.1 Construction Phase

6.1.1 Trip Derivation

During the 12 month construction period, the following traffic will require access to the to the Site:

- Staff transport, in either cars or staff minibuses;
- Construction equipment and materials, deliveries of machinery and supplies such as geotextile and crushed rock; and
- General site supplies.

6.1.2 Construction Staff

Staff would arrive in non-HGV vehicles and where possible will be encouraged to car share. The workforce onsite will depend on the activities undertaken, however, it is anticipated that a maximum workforce of up to 20 staff per day is to be expected.

For the purposes of estimating traffic movements, it was assumed that 40% of staff would be transported by minibus and 60% would arrive by car (single car occupancy was assumed as the worst case at this stage with potentially fewer movements through car sharing).

Based on these assumptions, staff transport cars and light vehicles would account for a maximum of 26 vehicle trips (13 inbound and 13 outbound) per day during the peak period of construction.

6.1.3 General Deliveries

General site supplies will be made on a regular basis and would include ancillary items such as supplies for the site compound and the delivery of drainage pipes and general materials. A provision of 40 deliveries (20 inbound and 20 outbound) per month has been assumed.

6.1.4 Material Deliveries

Various materials will need to be delivered to site to form the site-based infrastructure. At the outset, HGV deliveries will deliver plant and initial material deliveries to the site to enable the formation of the site compound and to delivery construction machinery.

The delivery of geotextile for use in the new construction would attract up to 2 HGV movements during the construction period (1 inbound and 1 outbound), while the delivery of ducting materials would attract up to 10 HGV movements during the construction period (5 inbound and 5 outbound).

Concrete for the use in the construction of the Proposed Development will be delivered to Skye via the A87 and subsequently along the A855. The proposed vehicle movements associated with the delivery of concrete is presented in Table 6.

Table 6: Concrete Deliveries

Total Volume (m^3)	Lorry Capacity (m^3)	Inbound Trips	Total Journeys
1,254	6	209	418

Reinforcement will be required in foundations across the site and are detailed in Table 7 below.

Table 7: Steel Reinforcement Deliveries

Total Weight (Tonnes)	Lorry Capacity (Tonnes)	Inbound Trips	Total Journeys
100	30	4	8

Rock material for use in the construction of the will be delivered from the A855 corridor to site from the nearby quarry in Lealt. All material will be imported to site and it is expected that 5,260 tonnes of material will be required. Table 8 illustrates the number of vehicle movements associated with the import of rock material.

Table 8: Rock Deliveries

Total Weight (Tonnes)	Lorry Capacity (20tonnes)	Inbound Trips	Total Journeys
52,650	15	3,510	7,020

In addition to the rock materials required for construction, gravel will be imported for the construction of the carpark area. It is expected that 511 tonnes of gravel will be required. Table 9 shows the number of vehicle movements associated with the import of gravel material.

Table 9: Gravel Deliveries

Total Weight (Tonnes)	Lorry Capacity (20tonnes)	Inbound Trips	Total Journeys
511	20	26	52

The resulting traffic generation estimates have been plotted onto the indicative construction programme to illustrate the peak journeys on the network.

Table 10 illustrates the trip generation throughout the construction programme. Please note that rounding errors may occur in summary tables where average flows have been calculated.

Table 10: Construction Traffic Profile

Activity		Month					
	Class	1	2	3	4	5	6
Staffin Site Establishment	HGV	100	50				
General Site Deliveries	HGV	40	40	40	40	40	40
Breakwater Bulk Material Deliveries	HGV		878	878	878	878	878
Quarry Plant Deliveries	HGV	40					
Readymix Concrete Deliveries	HGV						
Reinforcement	HGV						
Geotextiles	HGV						2
Building Materials	HGV						
Pontoon Deliveries	HGV						
Surfacing Gravel	HGV						
Commissioning	Car & LGV						
Staff	Car & LGV	308	572	572	572	572	572
Total HGV		180	968	918	918	918	920
Total Cars / LGV		308	572	572	572	572	572
Total Movements		488	1540	1490	1490	1490	1492
Total HGV per Day		8	44	42	42	42	42
Total Cars / LGV per Day		14	26	26	26	26	26
Total Per Day		22	70	68	68	68	68

Continued overleaf

Activity		Month					
	Class	7	8	9	10	11	12
Staffin Site Establishment	HGV					100	50
General Site Deliveries	HGV	40	40	40	40	40	40
Breakwater Bulk Material Deliveries	HGV	878	878	878			
Quarry Plant Deliveries	HGV				40		
Readymix Concrete Deliveries	HGV	105	105	105	105		
Reinforcement	HGV	4		4			
Geotextiles	HGV						
Building Materials	HGV		29	29	29		
Pontoon Deliveries	HGV					10	
Surfacing Gravel	HGV				26	26	
Commissioning	Car & LGV						44
Staff	Car & LGV	572	572	572	572	572	308
Total HGV		1026	1051	1055	239	176	90
Total Cars / LGV		572	572	572	572	572	352
Total Movements		1598	1623	1627	811	748	442
Total HGV per Day		47	48	48	11	8	4
Total Cars / LGV per Day		26	26	26	26	26	16
Total Per Day		73	74	74	37	34	20

The peak of construction occurs in Month 8 with 74 journeys (26 Car / Lights and 48 HGV journeys).

6.1.5 Distribution of Construction Trips

The distribution of development traffic on the network would vary depending on the types of loads being transported. The assumptions for the distribution of construction traffic during the peak months would be as follows:

- Deliveries associated with the batching of concrete on site will arrive via the A855 to the south of the site;
- Rock materials will be sourced from the local Lealt Quarry via the A855 to the south of the site;
- Staff working at the site are likely to be based locally and it is anticipated that they will travel northbound along the A855; and
- General site deliveries will be via the A855 to site. These are generally smaller rigid HGV vehicles.

The peak traffic flows have been developed using the peak month flows and the distribution assumptions and are illustrated in Table 11.

Table 11: Peak Construction Traffic

Survey Location	Cars & LGV	HGV	Total
Staffin Road	26	48	74
A855 between Lealt Quarry and Staffin Road	26	48	74
A855 south of Lealt Quarry	26	8	34
A87 South of Portree	0	8	8

6.1.6 Committed Developments

There is one consented development (19/02172/FUL) which is to be located via the access track from the A855. The development involves converting an agricultural shed to a farm shop and catering facility. Within THC's Delegated Report of Handling (available on THC's Planning Application Portal for 19/02172/FUL

planning documents) it is reported, in relation to the access track leading to the Staffin Community Harbour that:

"This road already handles large amounts of vehicular traffic from the A855 down to the bay all of which passes the front of this property. Once completed and open it is considered likely that many of the customers of the new retail unit and café will be drawn from this existing traffic."

As traffic associated with the consented development is considered to be mainly pass-by traffic from vehicles travelling along the access track, committed traffic flows are not to be included in the assessment.

With regards to the construction of the consented development, any crossover of traffic with the Proposed Development flows would be addressed via a traffic management plan. The inclusion of further traffic flows in the base line would dilute the potential impact that the Proposed Development would have. As such, the approach taken is considered to be an overly robust assessment. The inclusion of further traffic flows in the base line will dilute the potential impact that the proposed development proposals will have. As such, the approach taken is considered to be an overly robust assessment.

The use of Low National Road Traffic Forecasts (NRTF) traffic growth assumptions have provided a robust future year assessment scenario to account for the level of trip generation that can occur as a result of the types of local development that may occur within the study area and the effects of tourist traffic on the network.

6.2 Operational Phase

A TRICS assessment of Land Use: Marinas was undertaken in order to estimate trip generation associated with the Proposed Development during the operational phase. The trip rates are those which were previously detailed in Section 5.1.5, Table 3.

The estimation of the trips associated with the Proposed Development is presented in Table 12.

Table 12: Upgraded Slipway (Marina) – Trip Estimations

	Daily Trip Rate			Daily Number of Trips		
Location	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Upgraded Staffin Community Harbour (38 parking spaces)	0.843	0.858	1.701	32	33	65

*Variances Due to Rounding

Table 12 suggests that the daily number of trips associated with the Proposed Development is 65 (32 inbound and 33 outbound). The daily trip rates outlined in TRICs for Marinas are calculated from surveys between 07:00 a.m. and 21:00 p.m. If the operating times of the upgraded Staffin Community Harbour will operate during the same times as the TRICS survey site, it is anticipated that there will be approximately 5 trip movements per hour, which is deemed negligible and does not require further assessment.

7 Traffic Impact Assessment, including Parking and Mitigation Measures

7.1 Construction Impact

7.1.1 Construction Impact

The peak month traffic data was combined with the future year (2023) traffic data to allow a comparison between the baseline results to be made. The increase in traffic volumes is illustrated in percentage increases for each class of vehicle. This is illustrated in Table 13.

Table 13: Peak Construction Traffic

Survey Location	Cars & LGV	HGV	Total	Cars & LGV % Increase	HGV % Increase	Total Traffic % Increase
Staffin Road	111	50	161	30.6%	2387.9%	84.8%
A855 between Lealt Quarry and Staffin Road	880	84	964	3.0%	132.7%	8.3%
A855 south of Lealt Quarry	880	44	924	3.0%	21.9%	3.8%
A87 South of Portree	3983	147	4130	0.0%	5.7%	0.2%

*Variances Due to Rounding

Table 13 suggests that the total traffic movements and HGV movements are anticipated to increase by more than 30%, respectively. Whilst the increases in traffic along Staffin Road are statistically significant, it is as a result of relatively low baseline total traffic and HGV flows on this section of road. It should be noted that this increase equates to an increase in total traffic movements and HGV movements of 74 and 48 movements, respectively.

The total HGV traffic movements will increase significantly on the A855. Again, although this increase is statistically significant, it is generally caused by the relatively low HGV flows on the A855 and will see an additional 48 HGV journeys per day (24 inbound and 24 outbound). This represents less than three inbound HGV journeys every hour during normal construction activities, which is not considered significant in operational terms.

It should also be noted the construction phase is transitory in nature and the peak of construction activities is short-lived.

A review of existing road capacity has been undertaken using the Design Manual for Roads and Bridges, Volume 15, Part 5 “The NESA Manual”. The theoretical road capacity has been estimated for each of the road links for a 12-hour period that makes up the study area. The results are summarised in Table 14.

Table 14 2023 Peak Traffic Flow Capacity Review

Survey Location	2023 Baseline Flow	2023 Base + Development Flows	Theoretical Road Capacity (12hr)	Spare Road Capacity %
Staffin Road	87	161	3360	92%
A855 between Lealt Quarry and Staffin Road	890	964	21600	91%
A855 south of Lealt Quarry	890	924	21600	91%
A87 South of Portree	4122	4130	21600	62%

The results indicate there are no road capacity issues with the proposed development and ample spare capacity exists within the trunk and local road network to accommodate construction phase traffic.

7.2 Parking

7.2.1 Vehicle Parking

The maximum parking levels required for leisure and industrial developments are outlined in The Highland Council's Roads and Transport Guidelines for New Developments guidance document and is shown in Table 15 below.

Table 15: Parking Guidelines (THC's Transport Guidelines for New Developments Table 6.3 and Table 6.7)

Development Type	Maximum Parking Levels
Marinas	2 space per berth plus one space per 2 staff
Non-food warehouse (trade)	1 space per 50m² GFA

Table 16 shows the proposed parking provisions for the Proposed Development by applying the guidelines outlined in Table 15 to the development proposals.

Table 16: Proposed Vehicle Parking Provision

Development Type	Maximum Parking Levels
Marinas (15 berths)	(15 berths x 2) + (1 staff) = 31 spaces
Non-food warehouse (trade) (Sheds 340m²)	340m² / 50m² = 7 spaces
Total Provision	38 spaces

THC's Roads and Transport Guidelines for New Developments guidance document specifies the minimum requirements for disabled parking bays, which are outlined in Table 17 below.

Table 17: Car Parking for Disabled Persons – Minimum Requirements

Development Type	Car park maximum standards size up to 200 spaces
Retail, Leisure and Recreation Uses	To be based on an assessment of need. Minimum 1 space for car parks up to 20 spaces and for larger car parks minimum of 2 spaces or 6% of maximum standard size, whichever is the greater
Total Provision	2 spaces

In summary, a total of 38 car parking spaces are to be provided which will include two disabled parking bays.

7.2.2 Cycle Parking

The minimum recommended cycle parking provision outlined in THC's Roads and Transport Guidelines for New Developments guidance document notes that for recreational developments that 1 space is required per 8 parking spaces. Therefore, it is proposed that a minimum of 5 cycle spaces will be provided.

7.2.3 Motorcycle parking

The minimum recommended cycle parking provision outlined in THC's Roads and Transport Guidelines for New Developments guidance document notes that for recreational developments that 1 space per 25 car parking spaces, with at least 1 space provided. It is therefore proposed that two motorcycle parking spaces will be provided.

7.3 Proposed Mitigation Measures

7.3.1 Staffin Slipway Implementation

7.3.1.1 Inspection of Access Road to Slipway

An inspection of Staffin Road from the A855 to the existing slipway was undertaken on 3 March 2021 by Wallace Stone LLP on behalf of Staffin Community Trust and is provided in Appendix.B. The details of the inspection are presented in Table 18.

Table 2: Staffin Road Inspection Details

Location	Road Condition	Highlighted Recommendation
Ch 160-180	Road narrow (min. 2.45m), soft verge and ditch to right.	
Ch 250 and bend	Surface in poor condition, some holes and patches.	
Ch 300-392	Good condition, narrow soft verge and ditch to right, trees close on right. Widening at bend leading on to bridge ch 376-392. Bridge 3.3m clear between kerbs, with 1.0m footpath left and 0.6m edge strip right. One hole in bridge surfacing, through to waterproofing.	Fill hole approx. 0.8x0.5m
Ch 410	Cattle grid 3.3m clear between kerbs, good condition. Hard area (unsurfaced) just beyond to ch 430 – allows for passing.	
Ch 490-505	Cracking to left edge, although bedrock outcrops close by. Possible settlement.	Edge strengthening 15m long.
Passing place ch 533	Cracking and patches.	Resurface/reconstruct R edge 10m
Ch 615 – 633 passing place	Cracking along right edge, some settlement. Ditch close on right.	Edge strengthening 25m long
Ch 659	Settlement over culvert left side (300 diameter plastic pipe, with 0.45m cover).	Repair/replace pipe section, place and compact fill and repair road edge 2m
Ch 740 – 800	Patchy, wider round bend. Rock outcrops close to right side; steep drop on left side. From ch 800 generally good condition but narrow.	
Ch 845 – 930	Cracking to right edge. Soft verges, some patches and holes towards parking area at ch 935 to 955.	Edge reconstruction 85m long.
Ch 960 – 1030	Generally in good condition, narrow but straight.	
Ch 1040 – 1190	Widens to left, gravel strip on left edge, line of stones both sides. Adequate width.	
Ch 1190 – 1300	Fair condition, patchy. Gravel parking area left, stone edge left.	
Ch 1340 – 1350	Holes and patch including in passing place. Slip to bank above but not close enough to encroach onto road.	Reconstruct 6 sq.m
Ch 1380 – 1390	Patch to left edge, steep bank to left.	Repair 10m x 1.5m
Ch 1390 – 1450	Right edge collapsed and cracked	Edge reconstruction 60m long
Ch 1450 – 1740	Generally in good condition, recent surface with no defects. Patch and edge cracking around ch 1690.	

7.3.1.2 Inspection of Quarry Access

The inspection report undertook a visibility assessment at the access road to the proposed Lealt Quarry. Visibility was measured from 4.5m back from the edge of the main road, along the road edge to both north and south. The inspection established that there is 150m visibility to the north and 210m to the south.

7.3.1.3 Summary of Recommendations

Recommendations were made regarding any repair works which should be made both prior to and following the construction of the Proposed Development. Wallace Stone LLP's recommendations highlighted that reconstruction of the existing roadway at locations outlined in Appendix B (Drawing No. 2297–001,2297–002, 2297–003 and 2297–004).

It is recommended that approximately 210m of edge strengthening should be undertaken as well as patch repairs to the hole in the surfacing of the bridge, a patch at chainage 659 which includes a pipe that requires replacement and an area of approximately 6m² at chainage 1340-1350.

The inspection noted that:

"The surfacing at the entrance of the proposed Lealt Quarry is in fair condition and that no remedial works are required in advance to the main slipway traffic movements."

"It is possible that repairs will be required to the quarry entrance and/or the access road following the passage of the heavy traffic. These cannot be quantified at this stage."

7.3.2 Indicative Road Modification and Passing Place Plan

As the Staffin Road towards the slipway is generally 3m wide, it is considered relatively narrow. In order to accommodate the increase in two-way movements along the road towards the upgraded Staffin Community Harbour resulting from the construction works, it is proposed that a number of passing places will be enhanced along the length of Staffin Road.

The Highland Council has previously noted a general preference for layby enhancement works where the layby ideally features 15 m tapers at either end and is capable of accommodating a 15m long parallel section. Where possible, these ideal dimensions have been adhered to.

There are currently 14 passing places along the road. The proposed enhancements to the laybys are summarised in Table 19. A plan illustrating their location is provided in Appendix C.

Table 3: Proposed Staffin Road Layby Enhancements

Layby	Taper In (m)	Length (m)	Taper Out (m)	Width (m)	Side to Widen (from A855 to site)
1	7.5	20	10	6	Right
2	7.5	15	7.5	5.5	Construct partly in grass junction triangle and on right hand side including culvert of ditch.
3	7.5	15	7.5	4.5	Right and culvert ditch
4	15	20	15	6	Both Sides
5	15	20	15	6	Both Sides
6	15	15	15	6	Left
7	7.5	15	7.5	6	Right
8	15	20	7.5	6	Left
9	7.5	15	7.5	5.5	Left
10	7.5	15	7.5	5.5	Right
11	5	15	5	5.5	Mark off part of car park area
12	5.5	15	7.5	5	Right
13	7.5	15	7.5	6	Both Sides

Layby	Taper In (m)	Length (m)	Taper Out (m)	Width (m)	Side to Widen (from A855 to site)
14	15	15	15	6	Right
15	15	15	10	5.75	Left

When constructed, each layby area would need to have a metalled road surface in the interests of road safety and continuity of the existing infrastructure.

The detailed design of the passing places would be undertaken through a Road Opening Permit and Council officers have noted that flexibility in the design would be possible. The final design would be secured by planning condition and implemented and designed in detail followed by a site walkover with the Council's Transport Officer and Local Network Manager. All of the facilities would then be completed prior to the start of construction activities.

None of the areas highlighted (with the exception of Layby 1, require third party land rights and all works would be contained within areas that The Highland Council has noted lie within the extents of general road adoption. Layby 1 will require third party land and an agreement for the necessary area has been obtained by the Applicant.

At Layby 7, the existing rock face will be reprofiled to remove loose material and to improve and enhance forward visibility.

Throughout the early sections of the road, verge vegetation and overhanging tree branches would be trimmed to improve forward visibility.

All of the layby areas would be formally signed and "No Parking" sign plates to discourage tourist parking in them. In addition, the Applicant wished to engage with the Council on what innovative measures could be placed on the road in the long term to discourage certain types of larger vehicles on the road, whilst still allowing access for service and slipway HGV traffic. This could include warning signs on the A855 that advise of no turning facilities for large vehicles at the end of Staffin Road.

7.4 Framework Traffic Management Plan

7.4.1 Introduction

During the construction period, a project website, blog or Twitter feed would be regularly updated to provide the latest information relating to traffic movements associated with vehicles accessing the site. This would be agreed with The Highland Council.

The following measures would be implemented during the construction phase through the CTMP:

- Where possible the detailed design process would minimise the volume of material to be imported to site to help reduce HGV numbers;
- A site worker transport and travel arrangement plan, including transport modes to and from the worksite (including pick up and drop off times);
- All materials delivery lorries (dry materials) should be sheeted to reduce dust and stop spillage on public roads;
- Co-ordination between the site and the quarry to ensure that HGV do not cross on the Staffin Road;
- Enhanced signage on Staffin Road including formal passing place signage, no parking road markings and construction traffic warning signage;
- Specific training and disciplinary measures should be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
- Wheel cleaning facilities may be established at the site entrance, depending the views of The Highland Council;
- Normal site working hours would be limited by planning condition to be agreed with THC

- Appropriate traffic management measures would be put in place on the A855 to avoid conflict with general traffic, subject to the agreement of the roads authority. Typical measures would include HGV turning and crossing signs and/ or banksmen at the site access and warning signs;
- Provide construction updates on the project website and or a newsletter to be distributed to residents within an agreed distance of the site.
- Adoption of a voluntary speed limit of 15 mph for all construction vehicles through Staffin Village;
- All drivers would be required to attend an induction to include:
    - A tool box talk safety briefing;
    - The need for appropriate care and speed control;
    - A briefing on driver speed reduction agreements (to slow site traffic at sensitive locations through the villages); and
    - Identification of the required access routes and the controls to ensure no departure from these routes.

The Highland Council is likely to request that an agreement to cover the cost of abnormal wear on its network is made.

Video footage of the pre-construction phase condition of the road leading down to the slipway would be recorded to provide a baseline of the condition of the road prior to any construction work commencing. This baseline would inform any change in the road condition during the construction phase. Any necessary repairs would be coordinated with The Highland Council's roads team. Any damage caused by traffic associated with the Proposed Development during the construction period that would be hazardous to public traffic would be repaired immediately.

Damage to road infrastructure caused directly by construction traffic would be made good and street furniture that is removed on a temporary basis would be fully reinstated.

There would be a regular road review and any debris and mud would be removed from the carriageway using an onsite road sweeper to ensure road safety for all road users.

7.4.2 Public Information

Information on the project would be provided to local media outlets such as local papers and local radio to help assist the public. The Applicant would provide construction updates to ensure information was distributed through its communication team via the project website, local newsletters and social media.

7.4.3 Operational Phase Mitigation

The site entrance junction and access track from the A855 towards Staffin Community Harbour will be well maintained and monitored during the operational life of the development. Regular maintenance will be undertaken to keep the site access and car park drainage systems fully operation and to ensure there are no run-off issues onto the public road network.

8 Conclusion

Pell Frischmann (PF) has been commissioned by Affric Limited to undertake a Transport Assessment in support if a proposed upgrade of the existing Staffin Slipway by developing the Staffin Community Harbour on the Isle of Skye.

Existing traffic data established a base point for determining the impact during the construction phase and was factored to future levels to help determine the effect of construction traffic on the local road network.

The construction traffic would result in a temporary increase in traffic flows on the road network surrounding the Proposed Development. The maximum traffic effect associated with construction of the Proposed Development is predicted to occur in Month 8 of the construction programme. During this month, an average of 48 HGV movements is predicted per day and it is estimated that there would be a further 26 car and light van movements per day to transport construction workers to and from the Site.

A series of mitigation measures and management plans have been proposed to help mitigate and offset the impacts of both the construction and operational phase traffic flows.

No link capacity issues are expected on any of the roads assessed due to the additional movements associated with the Proposed Development. The effects of construction traffic are temporary in nature and are transitory. With the proposed mitigation, no significant traffic effects are predicted.

Appendix A TRICS

Calculation Reference: AUDIT-610805-210712-0729

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 08 - MARINAS
Category : A - MARINAS
TOTAL VEHICLES

Selected regions and areas:

02	SOUTH EAST		
	KC	KENT	1 days
08	NORTH WEST		
	LC	LANCASHIRE	1 days
09	NORTH		
	CB	CUMBRIA	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Parking spaces
Actual Range: 24 to 100 (units:)
Range Selected by User: 15 to 1200 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/13 to 23/06/18

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Saturday	2 days
Sunday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	3 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Edge of Town	2
Free Standing (PPS6 Out of Town)	1

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Out of Town	1
No Sub Category	2

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

n/a	3 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 500m Range:
All Surveys Included

Secondary Filtering selection (Cont.):

Population within 1 mile:

1,000 or Less	1 days
10,001 to 15,000	1 days
15,001 to 20,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,000 or Less	1 days
5,001 to 25,000	1 days
125,001 to 250,000	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

1.1 to 1.5	2 days
1.6 to 2.0	1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	3 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	3 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 CB-08-A-01 MARINA CUMBRIA
HOWTOWN ROAD
PENRITH
POOLEY BRIDGE
Free Standing (PPS6 Out of Town)
Out of Town
Total Parking spaces: 100
Survey date: SATURDAY *07/06/14* *Survey Type: MANUAL*

2 KC-08-A-03 MARINA KENT
CASTLE ROAD
MAIDSTONE
ALLINGTON
Edge of Town
No Sub Category
Total Parking spaces: 24
Survey date: SATURDAY *12/05/18* *Survey Type: MANUAL*

3 LC-08-A-05 MARINA LANCASHIRE
KELBROOK ROAD
BARNOLDSWICK

Edge of Town
No Sub Category
Total Parking spaces: 60
Survey date: SUNDAY *16/06/13* *Survey Type: MANUAL*

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

MANUALLY DESELECTED SITES

Site Ref	Reason for Deselection
CA-08-A-02	Too many berths
EB-08-A-01	Too many berths
NA-08-A-02	Too many berths

TRIP RATE for Land Use 08 - MARINAS/A - MARINAS
TOTAL VEHICLES
Calculation factor: 1 PARKING SPACES
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. PARKING	Trip Rate	No. Days	Ave. PARKING	Trip Rate	No. Days	Ave. PARKING	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	1	100	0.010	1	100	0.000	1	100	0.010
08:00 - 09:00	2	80	0.019	2	80	0.031	2	80	0.050
09:00 - 10:00	3	61	0.098	3	61	0.016	3	61	0.114
10:00 - 11:00	3	61	0.103	3	61	0.043	3	61	0.146
11:00 - 12:00	3	61	0.120	3	61	0.076	3	61	0.196
12:00 - 13:00	3	61	0.109	3	61	0.065	3	61	0.174
13:00 - 14:00	3	61	0.076	3	61	0.076	3	61	0.152
14:00 - 15:00	3	61	0.033	3	61	0.082	3	61	0.115
15:00 - 16:00	3	61	0.087	3	61	0.147	3	61	0.234
16:00 - 17:00	3	61	0.071	3	61	0.125	3	61	0.196
17:00 - 18:00	2	80	0.037	2	80	0.087	2	80	0.124
18:00 - 19:00	1	100	0.040	1	100	0.040	1	100	0.080
19:00 - 20:00	1	100	0.020	1	100	0.020	1	100	0.040
20:00 - 21:00	1	100	0.020	1	100	0.050	1	100	0.070
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.843			0.858			1.701

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	24 - 100 (units:)
Survey date date range:	01/01/13 - 23/06/18
Number of weekdays (Monday-Friday):	0
Number of Saturdays:	2
Number of Sundays:	1
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	3

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : A - HOUSES PRIVATELY OWNED
TOTAL VEHICLES

Selected regions and areas:

03	SOUTH WEST		
	SM	SOMERSET	2 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
	NF	NORFOLK	1 days
	SF	SUFFOLK	2 days
05	EAST MIDLANDS		
	LE	LEICESTERSHIRE	1 days
	NR	NORTHAMPTONSHIRE	2 days
06	WEST MIDLANDS		
	WM	WEST MIDLANDS	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	SY	SOUTH YORKSHIRE	2 days
09	NORTH		
	TW	TYNE & WEAR	1 days
12	CONNAUGHT		
	CS	SLIGO	2 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: No of Dwellings
Actual Range: 19 to 1882 (units:)
Range Selected by User: 4 to 1882 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/13 to 20/10/20

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	1 days
Tuesday	5 days
Wednesday	2 days
Thursday	4 days
Friday	3 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	15 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Neighbourhood Centre (PPS6 Local Centre)	15

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	1
Village	14

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories

Secondary Filtering selection:

Use Class:

C3	15 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 500m Range:

All Surveys Included

Population within 1 mile:

1,000 or Less	4 days
1,001 to 5,000	8 days
5,001 to 10,000	2 days
25,001 to 50,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,000 or Less	2 days
25,001 to 50,000	1 days
50,001 to 75,000	3 days
75,001 to 100,000	2 days
125,001 to 250,000	4 days
250,001 to 500,000	2 days
500,001 or More	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	5 days
1.1 to 1.5	7 days
1.6 to 2.0	3 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	1 days
No	14 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	15 days

This data displays the number of selected surveys with PTAL Ratings.

Covid-19 Restrictions	Yes	At least one survey within the selected data set was undertaken at a time of Covid-19 restrictions

LIST OF SITES relevant to selection parameters

1 CA-03-A-06 MIXED HOUSES CAMBRIDGESHIRE
CRAFT'S WAY
NEAR CAMBRIDGE
BAR HILL
Neighbourhood Centre (PPS6 Local Centre)
Village
Total No of Dwellings: 207
Survey date: FRIDAY *22/06/18* *Survey Type: MANUAL*

2 CS-03-A-03 MIXED HOUSES SLIGO
TOP ROAD
STRANDHILL
STRANDHILL
Neighbourhood Centre (PPS6 Local Centre)
Village
Total No of Dwellings: 30
Survey date: THURSDAY *27/10/16* *Survey Type: MANUAL*

3 CS-03-A-04 DETACHED & SEMI-DETACHED SLIGO
R292
STRANDHILL

Neighbourhood Centre (PPS6 Local Centre)
Village
Total No of Dwellings: 63
Survey date: THURSDAY *27/10/16* *Survey Type: MANUAL*

4 LE-03-A-02 DETACHED & OTHERS LEICESTERSHIRE
MELBOURNE ROAD
IBSTOCK

Neighbourhood Centre (PPS6 Local Centre)
Village
Total No of Dwellings: 85
Survey date: THURSDAY *28/06/18* *Survey Type: MANUAL*

5 NF-03-A-21 MIXED HOUSES & FLATS NORFOLK
SIR ALFRED MUNNINGS RD
NEAR NORWICH
COSTESSEY
Neighbourhood Centre (PPS6 Local Centre)
Village
Total No of Dwellings: 1882
Survey date: TUESDAY *13/10/20* *Survey Type: MANUAL*

6 NR-03-A-02 DETACHED & SEMI-DETACHED NORTHAMPTONSHIRE
HARLESTONE ROAD
NEAR NORTHAMPTON
CHAPEL BRAMPTON
Neighbourhood Centre (PPS6 Local Centre)
Village
Total No of Dwellings: 47
Survey date: TUESDAY *20/10/20* *Survey Type: MANUAL*

7 NR-03-A-03 MIXED HOUSES & FLATS NORTHAMPTONSHIRE
MAIN STREET
NEAR WELLINGBOROUGH
LITTLE HARROWDEN
Neighbourhood Centre (PPS6 Local Centre)
Village
Total No of Dwellings: 44
Survey date: TUESDAY *20/10/20* *Survey Type: MANUAL*

8 SF-03-A-06 DETACHED & SEMI-DETACHED SUFFOLK
BURY ROAD
KENTFORD

Neighbourhood Centre (PPS6 Local Centre)
Village
Total No of Dwellings: 38
Survey date: FRIDAY *22/09/17* *Survey Type: MANUAL*

9 SF-03-A-08 MIXED HOUSES SUFFOLK
STANNINGFIELD ROAD
NEAR BURY ST EDMUNDS
GREAT WHELNETHAM
Neighbourhood Centre (PPS6 Local Centre)
Village
Total No of Dwellings: 34
Survey date: WEDNESDAY *16/09/20* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

10 SM-03-A-02 MIXED HOUSES SOMERSET
HYDE LANE
NEAR TAUNTON
CREECH SAINT MICHAEL
Neighbourhood Centre (PPS6 Local Centre)
Village
Total No of Dwellings: 42
Survey date: TUESDAY *25/09/18* *Survey Type: MANUAL*

11 SM-03-A-03 MIXED HOUSES SOMERSET
HYDE LANE
NEAR TAUNTON
CREECH ST MICHAEL
Neighbourhood Centre (PPS6 Local Centre)
Village
Total No of Dwellings: 41
Survey date: TUESDAY *25/09/18* *Survey Type: MANUAL*

12 SY-03-A-02 DETACHED & BUNGALOWS SOUTH YORKSHIRE
MANOR ROAD
NEAR SHEFFIELD
WALES
Neighbourhood Centre (PPS6 Local Centre)
Village
Total No of Dwellings: 25
Survey date: THURSDAY *10/09/20* *Survey Type: MANUAL*

13 SY-03-A-03 BUNGALOWS & DETACHED SOUTH YORKSHIRE
CHURCH LANE
NEAR BARNSLEY
WORSBROUGH
Neighbourhood Centre (PPS6 Local Centre)
Village
Total No of Dwellings: 19
Survey date: WEDNESDAY *09/09/20* *Survey Type: MANUAL*

14 TW-03-A-03 MIXED HOUSES TYNE & WEAR
STATION ROAD
NEAR NEWCASTLE
BACKWORTH
Neighbourhood Centre (PPS6 Local Centre)
Village
Total No of Dwellings: 33
Survey date: FRIDAY *13/11/15* *Survey Type: MANUAL*

15 WM-03-A-04 TERRACED HOUSES WEST MIDLANDS
OSBORNE ROAD
COVENTRY
EARLSDON
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total No of Dwellings: 39
Survey date: MONDAY *21/11/16* *Survey Type: MANUAL*

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

MANUALLY DESELECTED SITES

Site Ref	Reason for Deselection
DH-03-A-02	Public Transport Too High
GM-03-A-11	Public Transport Too High
WY-03-A-01	Public Transport Too High

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
TOTAL VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	15	175	0.078	15	175	0.283	15	175	0.361
08:00 - 09:00	15	175	0.141	15	175	0.327	15	175	0.468
09:00 - 10:00	15	175	0.122	15	175	0.161	15	175	0.283
10:00 - 11:00	15	175	0.104	15	175	0.119	15	175	0.223
11:00 - 12:00	15	175	0.120	15	175	0.130	15	175	0.250
12:00 - 13:00	15	175	0.135	15	175	0.143	15	175	0.278
13:00 - 14:00	15	175	0.140	15	175	0.122	15	175	0.262
14:00 - 15:00	15	175	0.174	15	175	0.164	15	175	0.338
15:00 - 16:00	15	175	0.203	15	175	0.156	15	175	0.359
16:00 - 17:00	15	175	0.261	15	175	0.147	15	175	0.408
17:00 - 18:00	15	175	0.310	15	175	0.152	15	175	0.462
18:00 - 19:00	15	175	0.245	15	175	0.153	15	175	0.398
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.033			2.057			4.090

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	19 - 1882 (units:)
Survey date date range:	01/01/13 - 20/10/20
Number of weekdays (Monday-Friday):	15
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	4
Surveys manually removed from selection:	3

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Appendix B Inspection of Access Road to Slipway Report

STAFFIN COMMUNITY TRUST

STAFFIN SLIPWAY IMPLEMENTATION

INSPECTION OF ACCESS ROAD TO SLIPWAY

Staffin Community Trust

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Wallace Stone
Royal Bank Buildings
Dingwall
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IV15 9HA

Tel: 01349 866775
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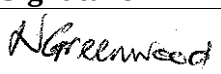
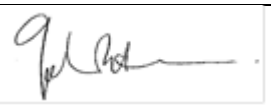
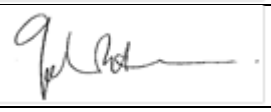
March 2021

Doc Ref – 2297/Doc/001

Member of the Association
for Consultancy and Engineering

This document was prepared as follows:-

	Name	Signature	Date
Prepared By	Nigel Greenwood		18.03.2021
Checked By	John Porteous		23.04.2021
Approved By	John Porteous		23.04.2021

and revised as follows:

REVISION STATUS INDICATOR

Page No	Date	Revision	Description of Change	Initial

This document has been reviewed for compliance with project requirements in accordance with Wallace Stone LLP Quality Management System.

STAFFIN COMMUNITY TRUST
STAFFIN SLIPWAY IMPLEMENTATION

INSPECTION OF ACCESS ROAD TO SLIPWAY

CONTENTS

APPENDICES

STAFFIN COMMUNITY TRUST
STAFFIN SLIPWAY IMPLEMENTATION

INSPECTION OF ACCESS ROAD TO SLIPWAY

1. INTRODUCTION

Staffin Community Trust are planning works to and around their slipway at Staffin, at the north end of the Isle of Skye. As part of the works, and the environmental statement, they require an inspection of the access road from the A855 to the slipway. Wallace Stone LLP has been appointed by the team to carry out this inspection and provide commentary on the condition of the road, and any recommended repair works either before or following the slipway works.

The access road is generally a single track surfaced road with passing places, and is adopted by the Highland Council. It has a length of about 1740 metres from its junction with the A855 just to the north of the village of Staffin (grid ref NG 483 680) to the head of the slipway (grid ref NG 495 681).

The proposed quarry is located a few kilometres to the south of Staffin. A check was made of the entrance to the quarry, and the visibility to either side along the man A855 road.

The inspection was carried out on 3rd March 2021 by a Chartered Civil and Structural Engineer. The weather was dry with light winds, and a temperature of about 5 to 8°C.

2. SUMMARY OF WORKS

The works at the slipway comprise the construction of areas of hardstanding for parking, and for new buildings. They will require the import of about 50,000 tonnes of stone from a local quarry to the site, over a period of around three months. Assuming that 20t capacity vehicles are used (gross vehicle weight 32 tonnes, 4 axle rigid body), a total of 2500 vehicle movements will be required, equating to around 32 vehicles per day over the three month period. The inspection is required to inform the environmental report as to the effect of this level of heavy traffic, and propose any repairs or strengthening which might be required in advance of the works, and possible repairs following.

The road is a single track over the full length, with passing places. Most of these are not large enough to accommodate two lorries passing, but would be adequate for a car to go into to allow a lorry to pass. The formation of the road is unknown, but parts are seen to be on or close to rock outcrops, while other areas appear to be in areas of soft ground such as peat.

3. ROAD GEOMETRY

A plan of the road is found in Appendix A, along with a diagram showing road widths along the road. The minimum width noted was 2.40 metres, and the road generally does not exceed 3.30 metres in width except at passing places.

Passing places are provided in accordance with the Table below.

		Dimensions of passing place (m)			
Distance	Side	Taper in	Length	Taper out	Max width
134	right	5.0	3.7	5.7	4.30
360	left	before bridge – large vehicles will need to use area to align to the bridge			
425	left	--	25.0	--	>5.0
537	left	8.9	7.0	10.6	5.8
639	left	8.5	3.8	8.2	4.75
859	left	7.3	5.9	5.8	5.2
945	right	--	~20.0	--	parking >10m
1062	left	9.2	6.5	11.3	5.4 on bend
1170	left	14.5	8.0	14.5	7.1
1351	right	5.3	7.7	7.0	4.1
1603	left	8.0	10.0	8.5	6.3
1674	right	8.7	4.5	10.0	6.4 on bend
1723	left	10.6	8.4	8.0	5.6

Passing is also accommodated by entrances and junctions, and by the parking area between about 1190 and 1300m. Passing opportunities are therefore available at an average spacing of about 125 metres.

4. ROAD CONDITION

A summary of road condition along the length is given following. Plans showing the various features noted are found in Appendix A.

4.1 Ch 160-180

Road narrow (min 2.45m), soft verge and ditch to right.

4.2 Ch 250 and bend

Surface in poor condition, some holes and patches.

4.3 Ch 300-392

Good condition, narrow soft verge and ditch to right, trees close on right. Widening at bend leading on to bridge ch 376-392. Bridge 3.3m clear between kerbs, with 1.0m footpath left and 0.6m edge strip right. One hole in bridge surfacing, through to waterproofing. *Fill hole approx. 0.8x0.5m*

4.4 **Ch 410**

Cattle grid 3.3m clear between kerbs, good condition. Hard area (unsurfaced) just beyond to ch 430 – allows for passing.

4.5 **Ch 490-505**

Cracking to left edge, although bedrock outcrops close by. Possible settlement. *Edge strengthening 15m long.*

4.6 **Passing place ch 533**

Cracking and patches.
Resurface/reconstruct R edge 10m

4.7 **Ch 615 – 633 passing place**

Cracking along right edge, some settlement. Ditch close on right.
Edge strengthening 25m long

4.8 **Ch 659**

Settlement over culvert left side (300 diameter plastic pipe, with 0.45m cover). *Repair/replace pipe section, place and compact fill and repair road edge 2m*

4.9 **Ch 740 – 800**

Patchy, wider round bend. Rock outcrops close to right side; steep drop on left side. From ch 800 generally good condition but narrow.

4.10 **Ch 845 – 930**

Cracking to right edge. Soft verges, some patches and holes towards parking area at ch 935 to 955. *Edge reconstruction 85m long.*

4.11 **Ch 960 – 1030**

Generally in good condition, narrow but straight.

4.12 **Ch 1040 – 1190**

Widens to left, gravel strip on left edge, line of stones both sides. Adequate width.

4.13 **Ch 1190 – 1300**

Fair condition, patchy. Gravel parking area left, stone edge left.

4.14 **Ch 1340 – 1350**

Holes and patch including in passing place. Slip to bank above but not close enough to encroach onto road. *Reconstruct 6 sq.m*

4.15 **Ch 1380 – 1390**

Patch to left edge, steep bank to left. *Repair 10m x 1.5m*

4.16 **Ch 1390 – 1450**

Right edge collapsed and cracked, verge? *Edge reconstruction 60m long*

4.17 **Ch 1450 – 1740**

Generally in good condition, recent surface with no defects. Patch and edge cracking around ch 1690.

5. QUARRY ACCESS

The proposed quarry is located about 8.7 km to the south of the start of the slipway access road, at approximate grid reference NG 518 606. The A855 is a two lane road at this point, with a speed limit of 60mph.

Visibility has been measured from a point 4.5 metres back from the edge of the main road, along the road edge to both north and south. This is shown in the photographs below (yellow jacket at the point of measured visibility).

150m visibility to north

210m visibility to south

6. RECOMMENDED IMPROVEMENTS

It is recommended that some areas of reconstruction, as noted in Section 4 above, be carried out in advance of the traffic movements. Without these repairs, it is likely that the edge of the road would fail in several locations, possibly resulting in vehicles becoming stuck in the verge or ditch, and potentially even overturning.

Typical edge reconstruction would comprise excavation of the edge of the road and verge, placing and compaction of suitable granular fill such as Type 1 sub-base, and surfacing with 100mm of bituminous material. Generally to accommodate edge cracking and provide a stable edge to the road, a width or reconstruction of around 1.0 metre is proposed.

A total of about 210 metres of edge strengthening is recommended, along with patch repairs to the hole in the bridge surfacing (less than 1 sq.m), a patch at ch 659 where the pipe needs to be replaced, and an area of about 6 sq.m at ch 1340-1350.

The surfacing at the entrance to the proposed quarry is in fair condition, and no remedial works are required in advance of the main slipway traffic movements.

It is possible that repairs will be required to the quarry entrance and/or the access road following the passage of the heavy traffic. These cannot be quantified at this stage.

Appendix A – Layout Drawings

CONTINUATION LINE

N

DRAIN

STAFFIN BAY HOLIDAY HOMES

PATCHES AND HOLES

WEIR

250

300

350

400

450

CG

UNSURFACED

PATCHES AND HOLES

BRIDGE APPROX. 15m SPAN

HOLE IN BRIDGE SURFACING

SOFT VERGE, DITCH

WEIR

EDGE CRACKS

TRACK

TREES CLOSE

150

134

DROP AT EDGE

ALDERLEA

27

100

WAR MEML

48

LB

0

STAFAINN (STAFFIN)

STAFFIN COMMUNITY TRUST
STAFFIN SLIPWAY IMPLEMENTATION
ROAD DAMAGES SHEET 1/4

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CHKD: NIG	DATE CHKD: 23.04.21
APPRVD: JP	DATE APPRVD: 23.04.21
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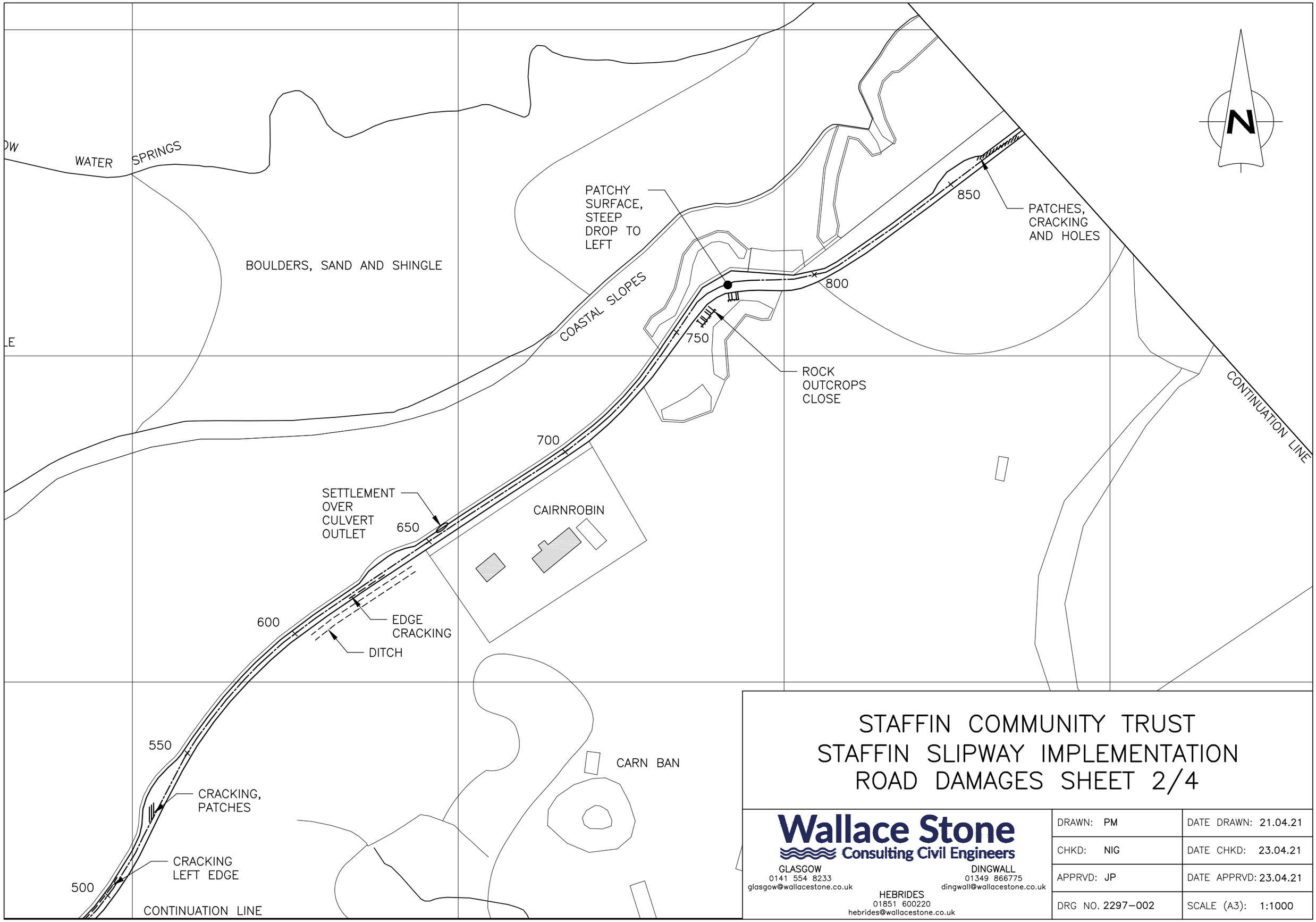

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ROAD DAMAGES SHEET 2/4

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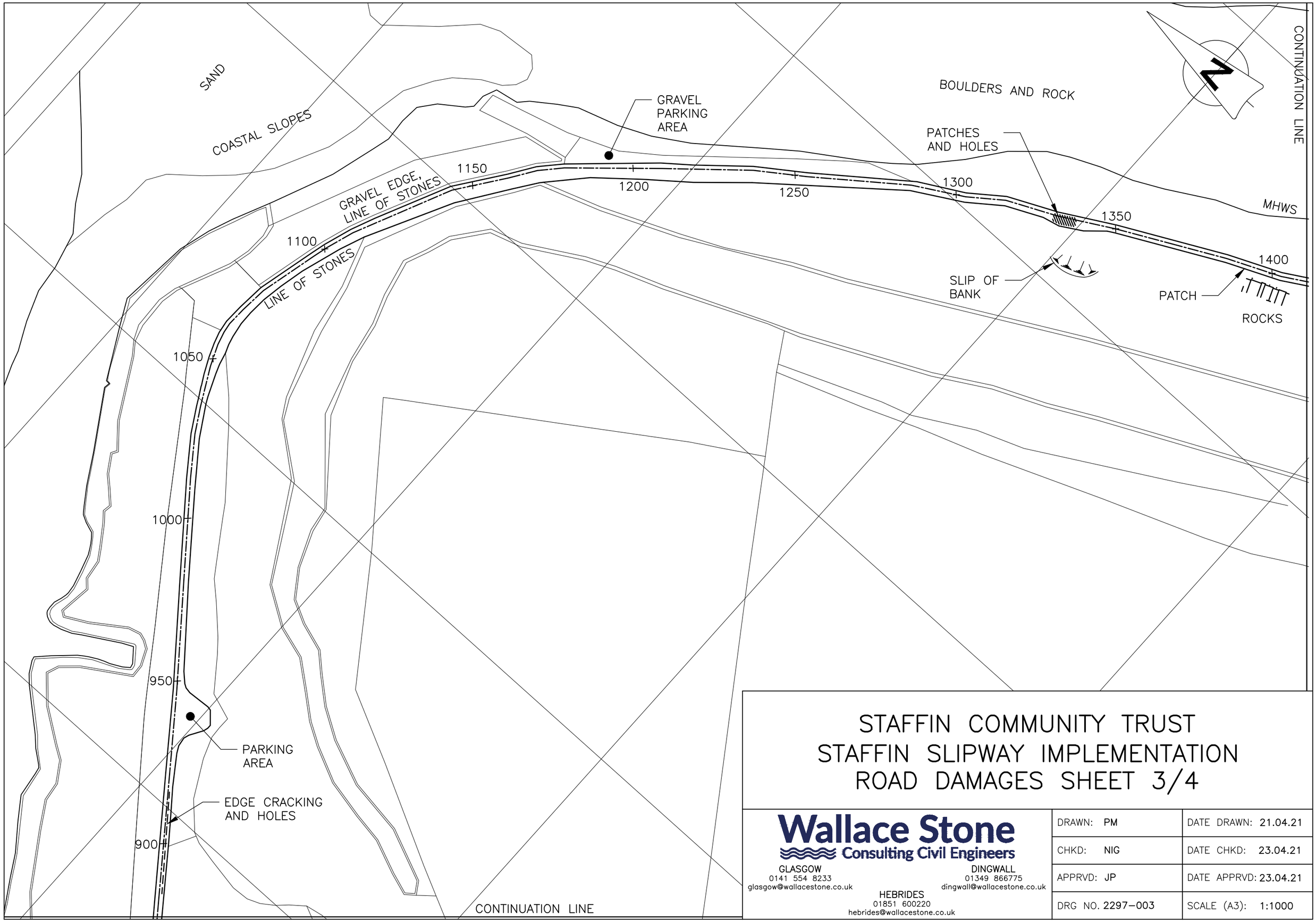

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ROAD DAMAGES SHEET 3/4

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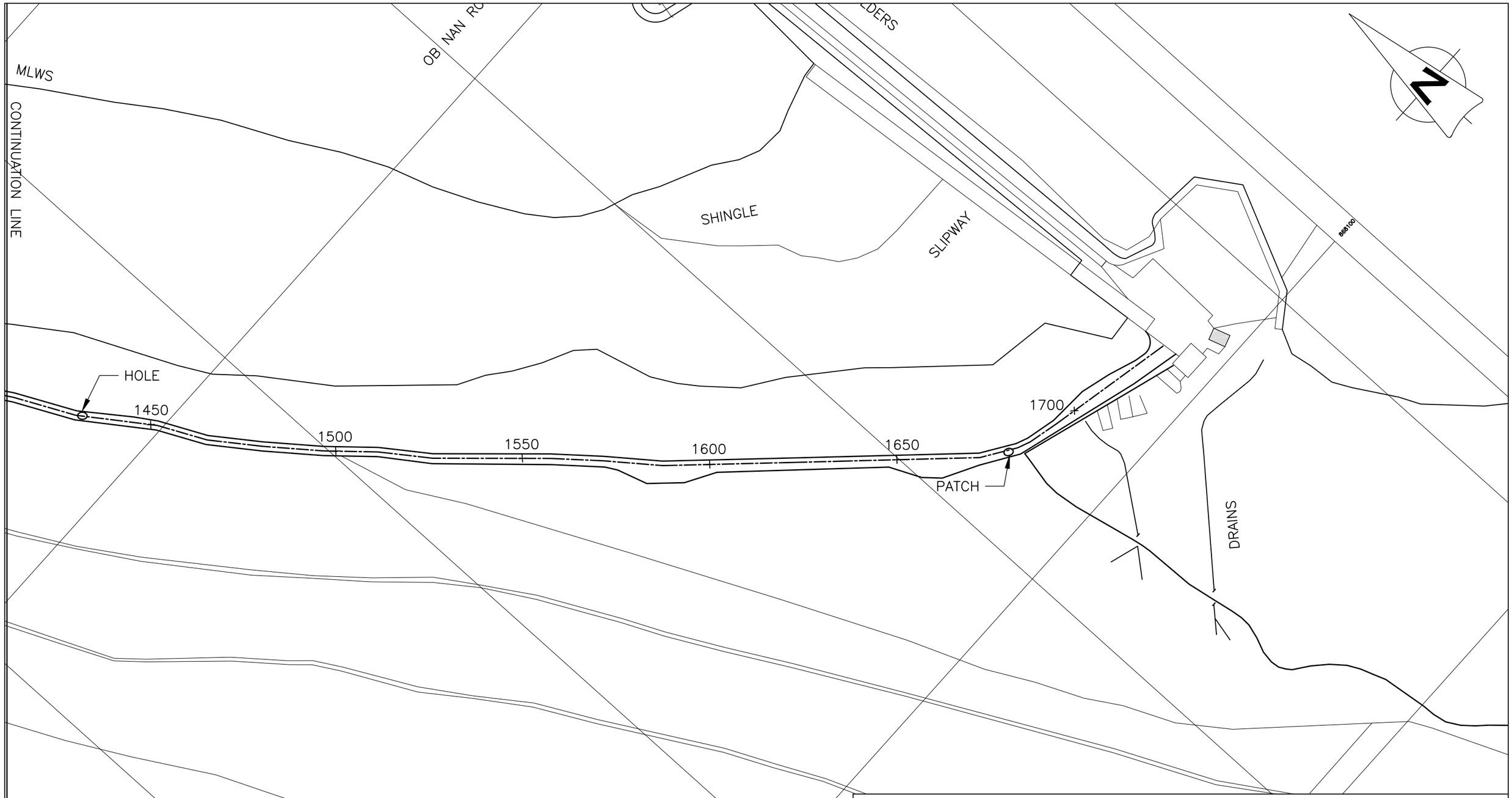

STAFFIN COMMUNITY TRUST
STAFFIN SLIPWAY IMPLEMENTATION
ROAD DAMAGES SHEET 4/4

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DRAWN: PM	DATE DRAWN: 21.04.21
CHKD: NIG	DATE CHKD: 23.04.21
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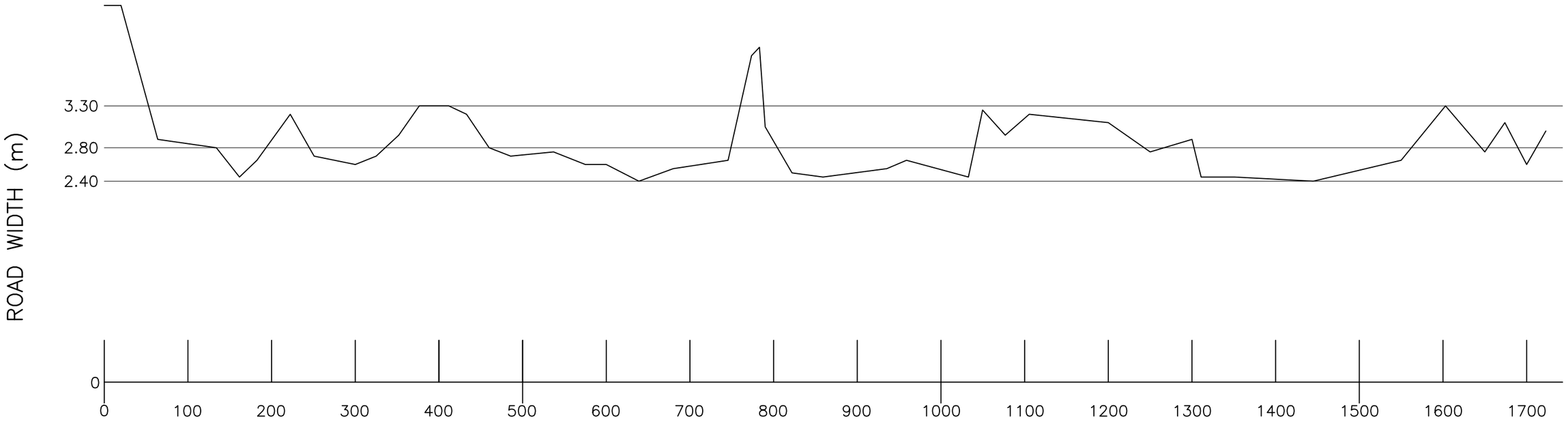

ROAD WIDTH COMPARISON

VERTICAL SCALE 1:50
HORIZONTAL SCALE 1:5000

STAFFIN COMMUNITY TRUST
STAFFIN SLIPWAY IMPLEMENTATION
ROAD WIDTH COMPARISON

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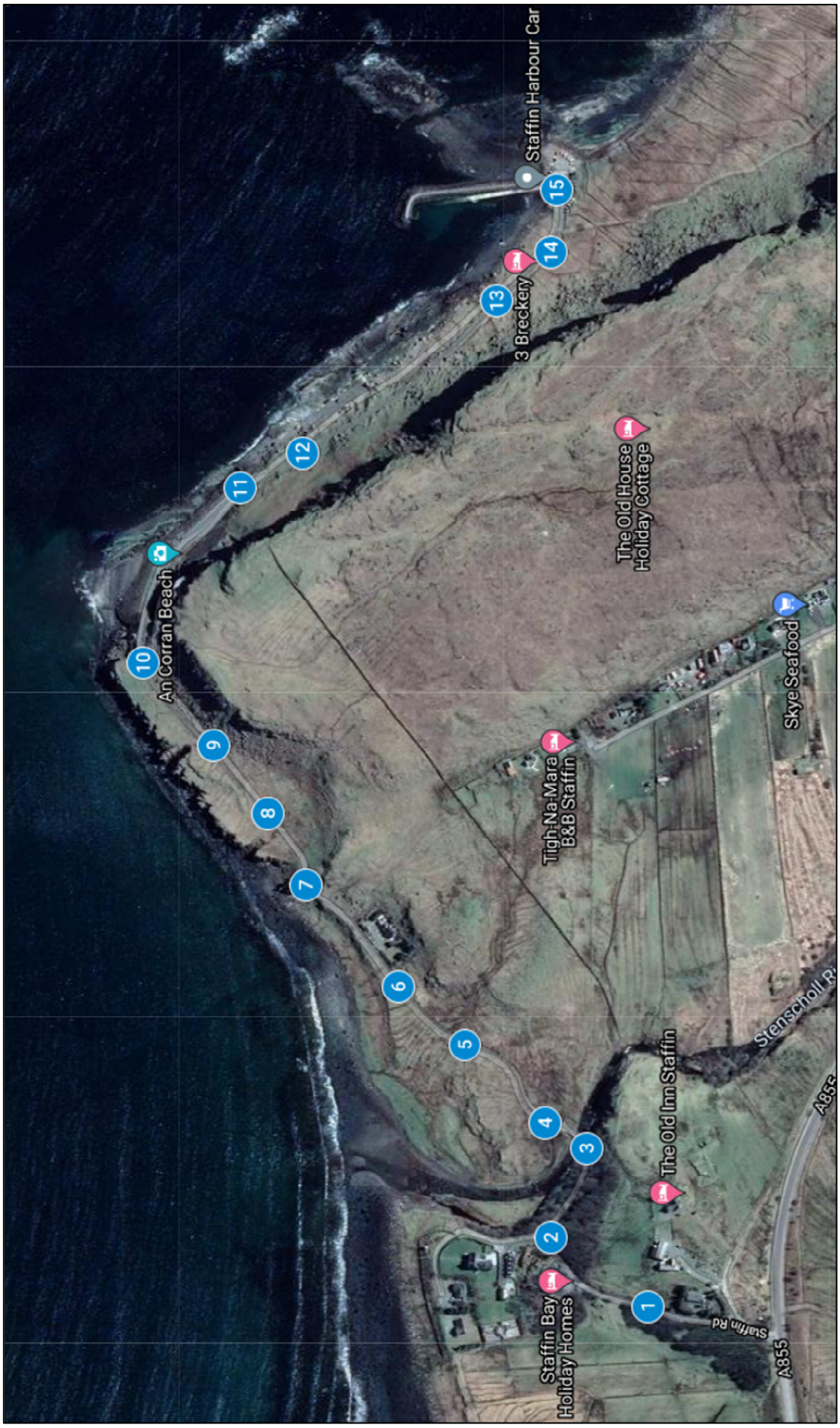
DRAWN: PM	DATE DRAWN: 21.04.21
CHKD: NIG	DATE CHKD: 23.04.21
APPRVD: JP	DATE APPRVD: 23.04.21
DRG NO. 2297–005	SCALE (A3): AS SHOWN

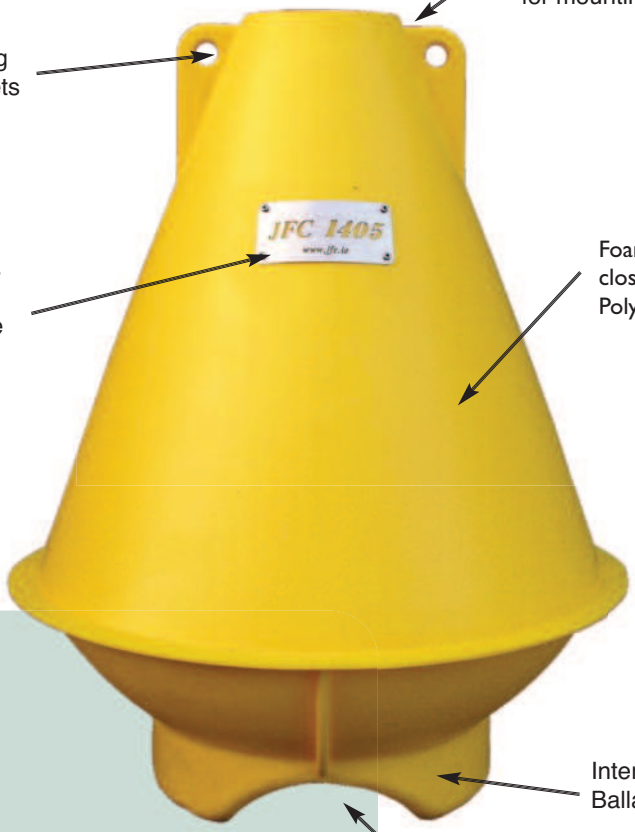
Appendix C Indicative Road Modification and Passing Place Plan

Passing Place Location Plan



Appendix P.1 Marine Cone & Can Buoys Navigation Aids

JFC Marine Cone & Can Buoys



Advantages

- These buoys are small and light weight
- Easy to Handle
- Excellent buoyancy & stability
- Fitted with high lifting eyes for ease of maintenance
- All steel used is 316 grade stainless steel
- Made from UV stabilised virgin polyethylene
- No painting or sand blasting required
- Designed to fit Navigation Lanterns
- Each section can be coloured to suit IALA specifications, cardinal, danger marks etc.

JFC Can/Cone navigation Buoy is designed as per IALA recommendations.
All Buoys are manufactured from UV-stabilised virgin polyethylene material

JFC Marine Cone

Nav03 - Cone

Specification

General Characteristics:	
Available Colours:	Green, Red, Yellow as per IALA recommendations
Focal Plane Height	870mm (Without Top Mark)
Physical Characteristics	
Material:	Rotationally Moulded UV-Stabilised Virgin Polyethylene.
	Steel all 316 Stainless Steel
Ballast:	50kg Internal Concrete
Filling:	Closed Cell Polyurethane Foam
Height	1260mm (Without Top Mark)
Width:	900mm
Mass:	80kg
Product Life Expectancy	Up to 12 Years
Certifications:	
Quality Assurance:	SGS_ISO 9001:2008
Intellectual Property	
Trademarks:	JFC is a registered Trade Mark of JFC Manufacturing Co Ltd
Warranty:	3 Years
Lantern Options:	SL15, SL60, SL70, SLC310
Accessory Options	Mould in graphics
	Monitoring Systems (RF-Com Sync, GPS Sync)
	Radar Reflector
	Top Marks

JFC Marine Can

Nav03 - Can

Specification

General Characteristics:	
Available Colours:	Green, Red, Yellow as per IALA recommendations
Focal Plane Height	870mm (Without Top Mark)
Physical Characteristics	
Material:	Rotationally Moulded UV-Stabilised Virgin Polyethylene.
	Steel all 316 Stainless Steel
Ballast:	50kg Internal Concrete
Filling:	Closed Cell Polyurethane Foam
Height	1260mm (Without Top Mark)
Width:	900mm
Mass:	90kg
Product Life Expectancy	Up to 12 Years
Certifications:	
Quality Assurance:	SGS_ISO 9001:2008
Intellectual Property	
Trademarks:	JFC is a registered Trade Mark of JFC Manufacturing Co Ltd
Warranty:	3 Years
Lantern Options:	SL15, SL60, SL70, SLC310
Accessory Options:	Mould in graphics
	Monitoring Systems (RF-Com Sync, GPS Sync)
	Radar Reflector,
	Top Marks

Appendix Q.1: RPS Hydraulic Report

Wallace Stone
Consulting Civil Engineers

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LIMITED

Staffin Harbour

Hydraulic modelling for the Radical East Option scheme

1 Introduction

A revise layout for the Radical East Option (REO) harbour layout and marina has been proposed as shown on the Wallace Stone drawing in Figure1. RPS were requested to undertake hydraulic modelling for this layout to predict the wave climate around the proposed marina berths and slipway to be located behind this revised breakwater arrangement and to examine the impact on the sediment transport regime.

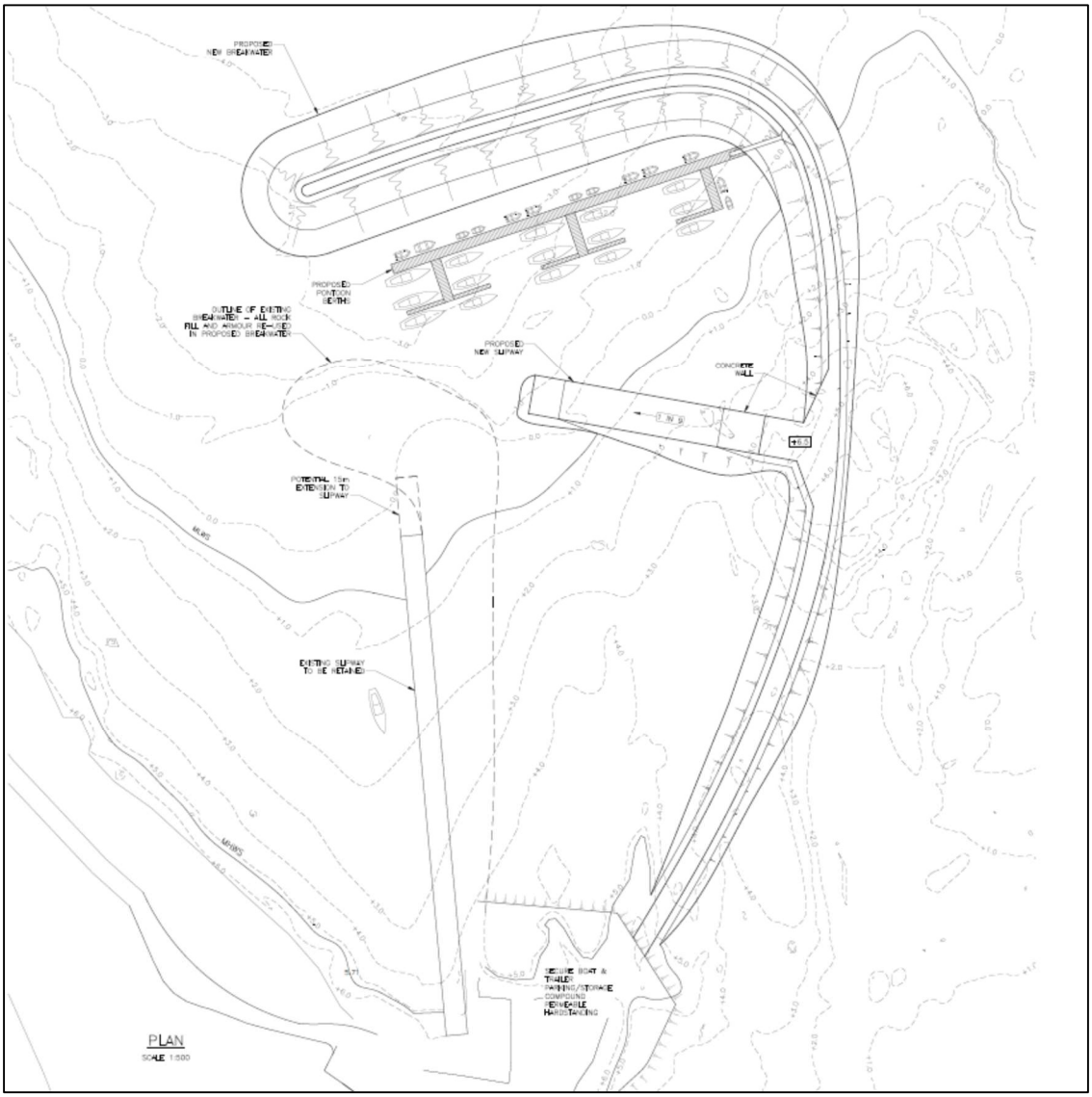


Figure 1 Radical East Option for Staffin Harbour with marina berths and slipway

The wave modelling has been undertaken for both 1 in 50 and 1 in 1 year return period storms at high water spring tides. The Mike21 SW wave model was used to transform the storm waves from offshore to the site and then the Mike21 Boussinesq harbour disturbance model was used to simulate the wave conditions around the proposed marina berths and slipway.

The impact of the proposed harbour on the sediment transport regime has been assessed by examining the littoral currents and wave climate for both the existing and the proposed harbour layout for 1 in 1 year storms and for the tidal conditions with the average wave height.

2 Wave Transformation

The wave transformation from offshore to the site was undertaken using RPS SW wave model of the North Minch. Simulations were undertaken for storms in which the waves were generated across the fetches of the North Minch from 330° to 135° as well as for storms which include swell waves from the North Atlantic from directions 345° to 045°.

The largest waves approach the breakwater at Staffin with mean directions in the range in the range 40° to 52° with spectral peak wave periods ranging from 15.73 seconds down to 9.2 seconds for 1 in 50 and 1 in 1 year return period storms. All the storm waves approach Staffin harbour from the east side of Staffin Island and the waves are highly modified by the reefs which lie immediately offshore of the breakwater site.

Figure 2 shows the attenuation of the 1 in 50 year return period storm waves from the north which include Atlantic swell waves while Figure 3 shows the same return period storm with the waves generated over the North Minch only. The spectral wave period was 15.73 seconds for the waves shown in Figure 2 and 11.5 seconds for the waves shown in Figure 3.

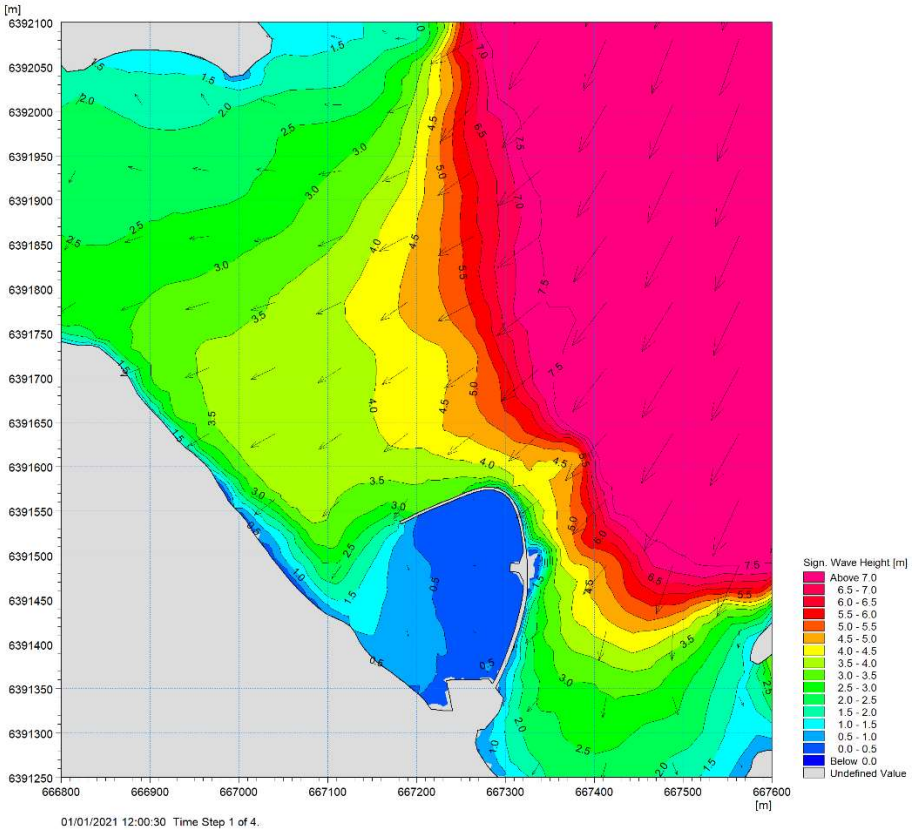


Figure 2 1 in 50 year storm from 000ºN with Atlantic swell – Hm0 and MWD at Staffin

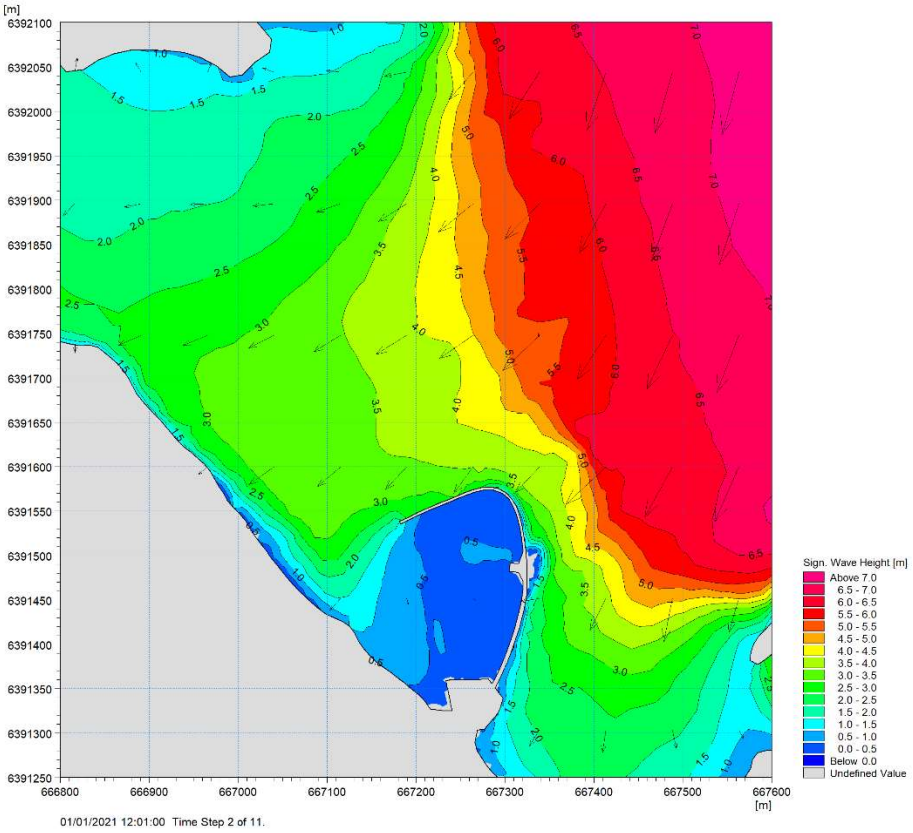


Figure 3 1 in 50 year storm from 000ºN in North Minch – Hm0 and MWD at Staffin

The boundary conditions for the harbour disturbance modelling were extracted from the results of the wave transformation modelling with the wave conditions at the boundary of the Boussinesq model taken from the wave climate that can penetrate over the reef which lies offshore to the north east of Staffin. The boundary wave conditions for the harbour disturbance model are shown in Table 1

Table 1 Boundary wave climates for harbour disturbance simulations

Storm return period [yr.}	Significant wave height Hm0 [m]	Spectral Peak Wave period Tp [s]	Mean Wave Direction [deg N]
1 in 50	4.40	15.73	52.0
1 in 50	3.90	11.50	47.5
1 in 1	3.40	11.96	46.0
1 in 1	2.93	9.20	42.0

3 Harbour Disturbance Simulations

The harbour disturbance simulations were undertaken using the advanced Boussinesq wave model MIKE21 BW. The extent of this model is shown in Figure 4. The model had a fine grid spacing of 2 metres and was orientated with its x-axis aligned to 50°. The wave generation line was along the right-hand side of the model diagram shown in Figure 4. The actual model extended further to the east but this part of the model was occupied with sponge layers to absorb wave energy coming off the back of the wave generator. For computational efficiency the parts of the model where waves would not influence the wave climate behind the breakwater were blocked off using virtual land as shown by the light blue area in Figure 4.

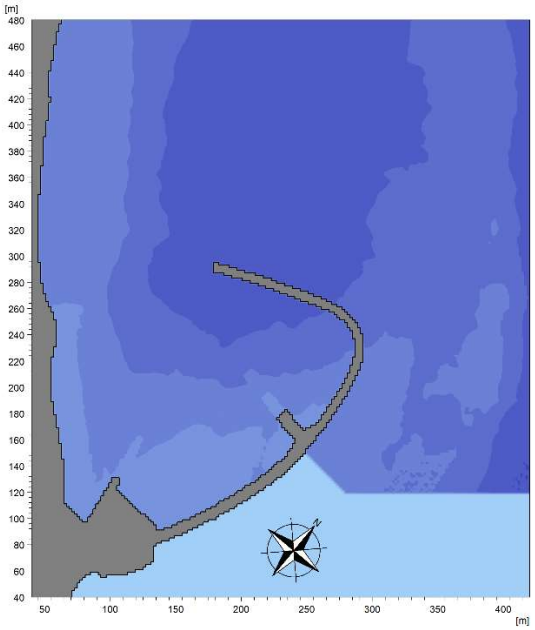


Figure 4 Extent of REO BW model for the marina and slipway at Staffin

The boundary waves were created using a random wave generator which was matched to the appropriate wave climate extracted from the results of the wave transformation simulations. The storm waves were generated for a period 25 minutes real time and an example of the output wave trace for the 1 in 50 year return period storm from the north, including Atlantic swell, is shown in Figure 5.

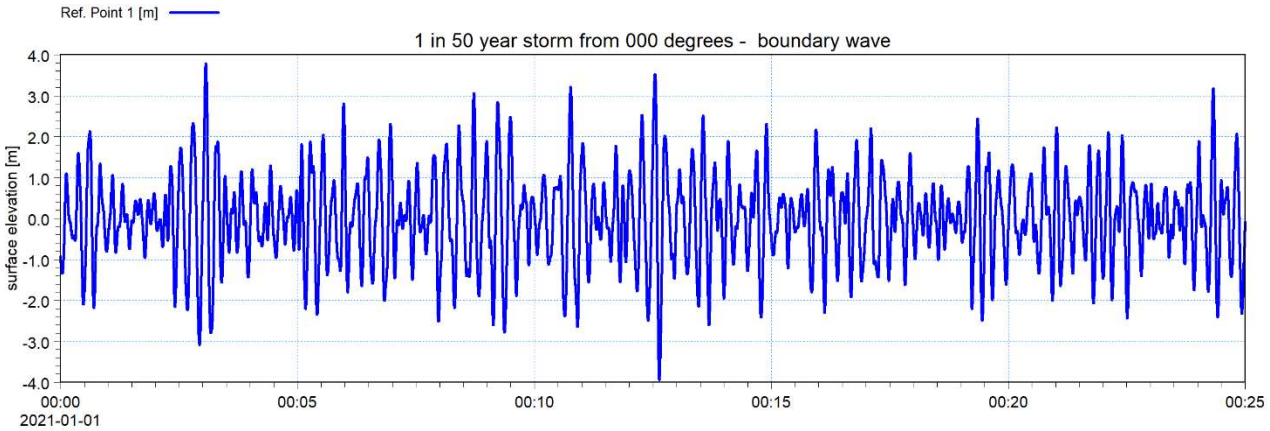


Figure 5 Boundary wave trace for 1 in 50 year return period storm from 000°N

The results of the harbour disturbance simulations are given in terms of typical wave disturbance patterns and the significant wave heights around the harbour basin. The location of the proposed marina is marked by a black line encompassing the marina area on the significant wave height plots. An example of the typical wave disturbance patterns is shown in Figure 6 for the 1 in 50 year storm generated across the North Minch.

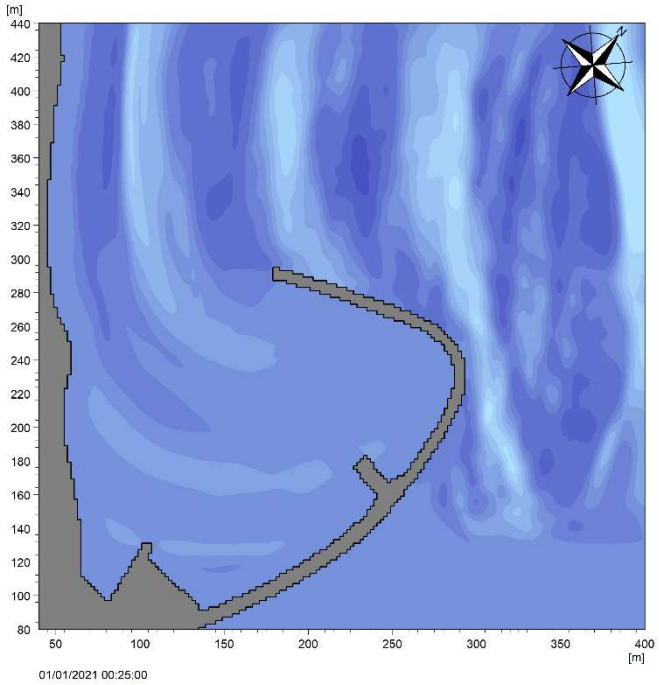


Figure 6 Wave induced flows (left) surface elevations (right) - 1 in 50 year storm

3.1 1 in 50 year return period storm from North including swell

The significant wave heights behind the breakwater during this 1 in 50 year return period storm at HW are shown in Figure 7. The extent of the marina area is shown by the black rectangular line. It will be seen that the significant wave heights over the entire marina area are predicted to be below 0.4m with the wave heights ranging from 0.34m to 0.21m. The significant wave height at the existing slipway will be about 0.47m.but only 0.28m at the new slipway. The wave period will be relatively long at about 15.73 seconds

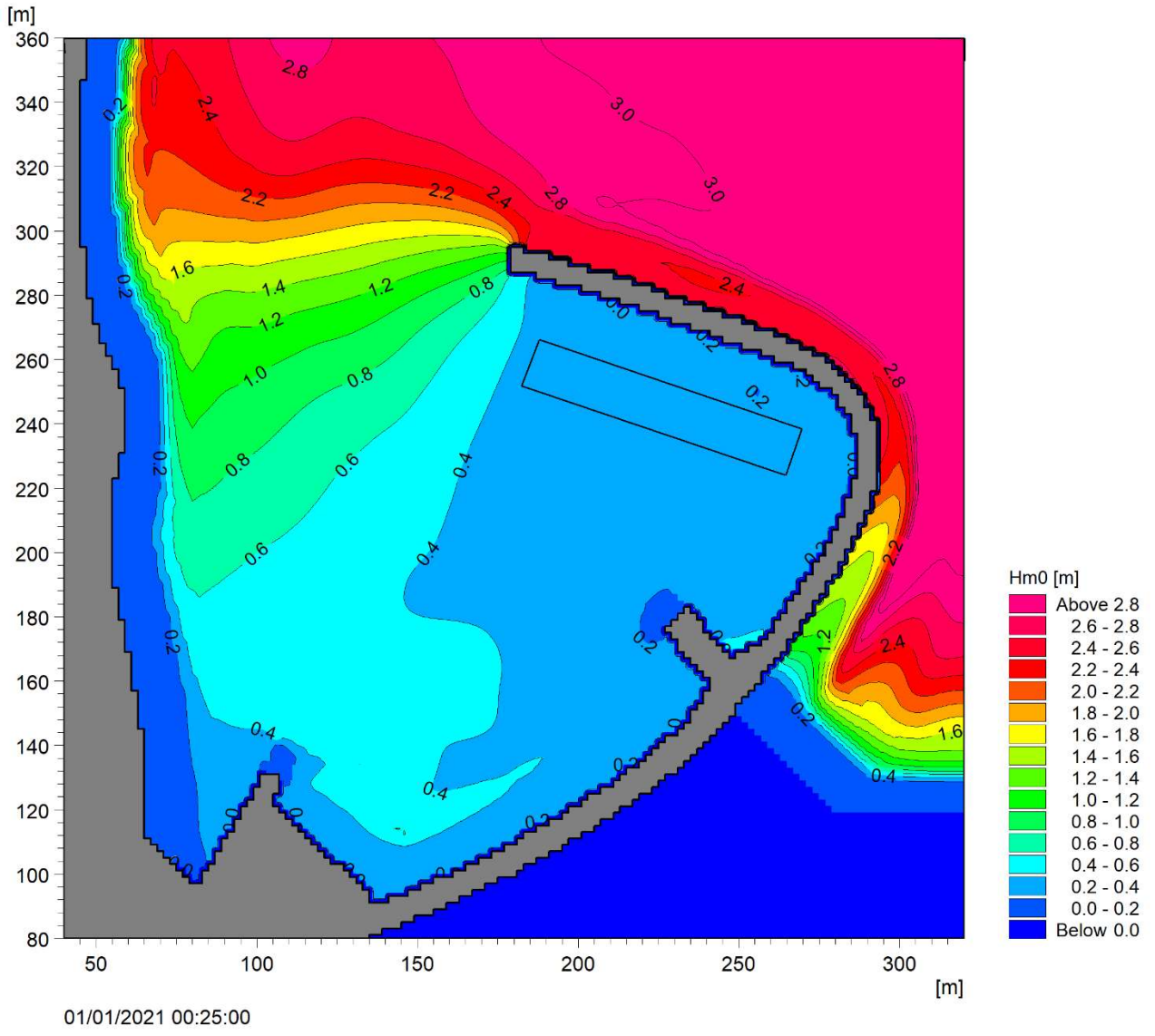


Figure 7 Significant wave heights – 1 in 50 year return period storm from the north with swell

3.2 1 in 50 year return period storm from north across fetch in North Minch

The significant wave heights behind the breakwater during this 1 in 50 year return period storm generating waves across the fetches in the North Minch at HW are shown in Figure 8. The extent of the marina area is shown by the black rectangular line. It will be seen that the significant wave heights over the entire marina area is predicted to be less than 0.4m with the heights ranging from 0.38m to 0.17m. The significant wave heights at the existing slipway will be about 0.42m while the significant wave height at the new slipway will be up to 0.3m. The spectral peak wave period of the waves will be about 11.5s.

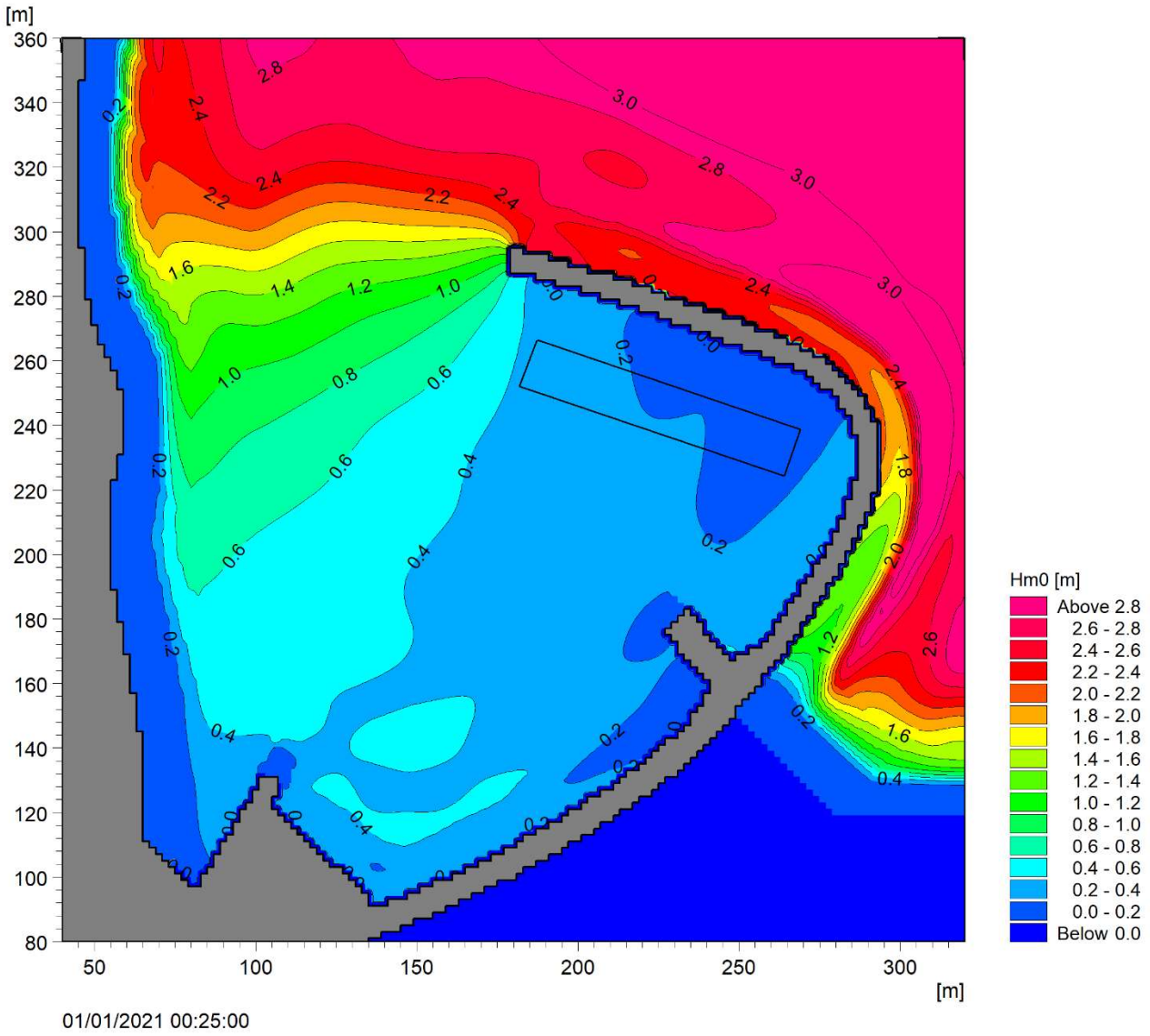


Figure 8 Significant wave heights – 1 in 50 year return period storm from the north with wave generation cross the North Minch

3.3 1 in 1 year return period storm from North including swell

The significant wave heights behind the breakwater during this 1 in 1 year return period storm at HW are shown in Figure 9. The extent of the marina area is shown by the black rectangular line. It will be seen that the significant wave heights over the marina area are expected to vary between about 0.33m to 0.16m. The significant wave height at the existing slipway is predicted to be up to 0.32m, while the significant wave heights at the new slipway are expected to be about 0.16 to 0.22 metres. The wave period during this 1 in 1 year return period event is about 11.96 seconds.

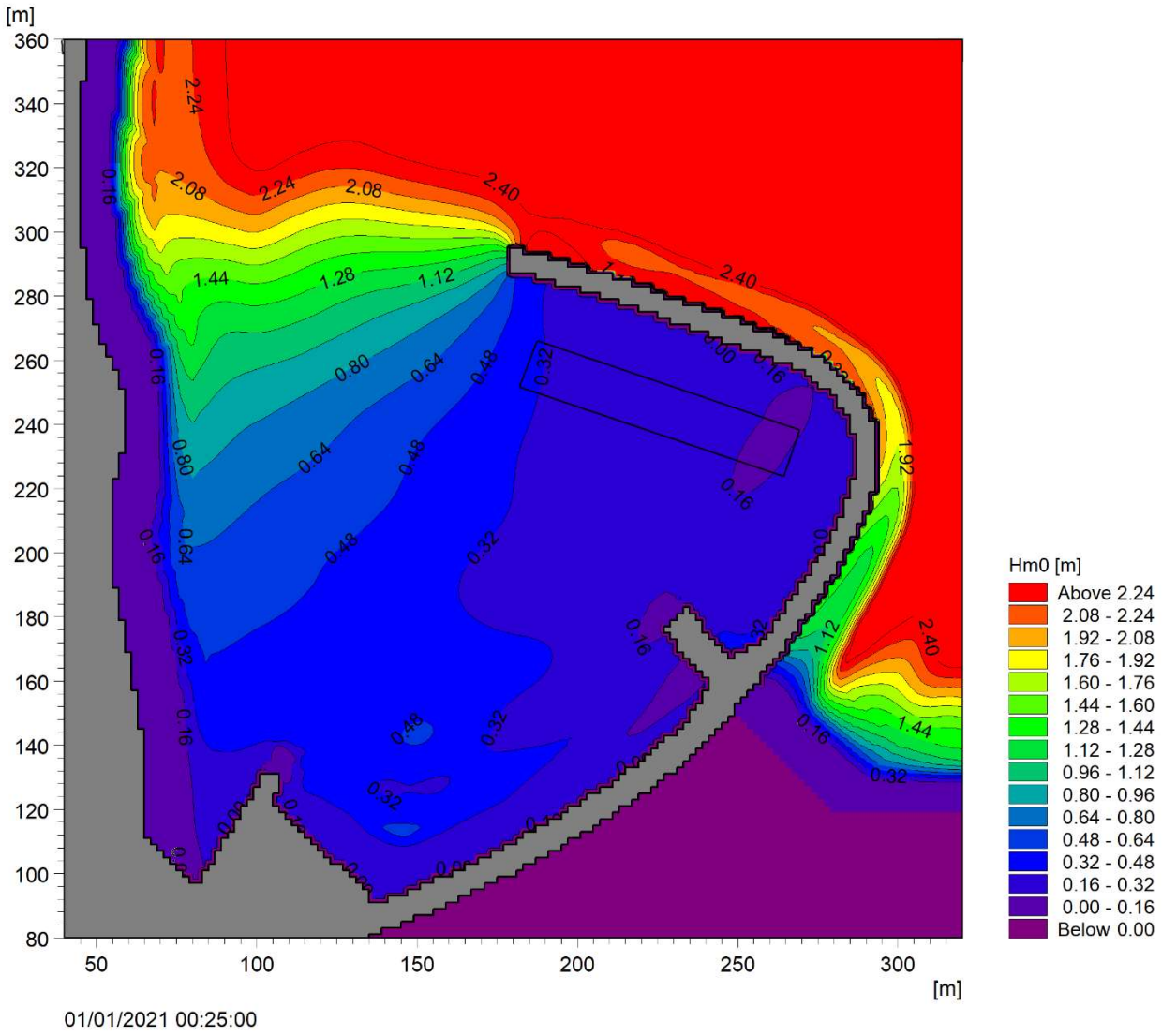


Figure 9 Significant wave heights – 1 in 1 year return period storm from the north with swell

3.4 1 in 1 year return period storm from north across fetch in North Minch

The significant wave heights behind the breakwater during this 1 in 1 year return period storm generating waves across the fetches in the North Minch at HW are shown in Figure 10. The extent of the marina area is shown by the black rectangular line. It will be seen that the significant wave heights over the marina area are predicted to vary between 0.30m to 0.15m. The significant wave height at the existing slipway is predicted to be about 0.33m while the significant wave height at the new slipway is expected to be about 0.16 t0 0.22m. The spectral peak wave period of the wave is predicted to be about 9.2s.

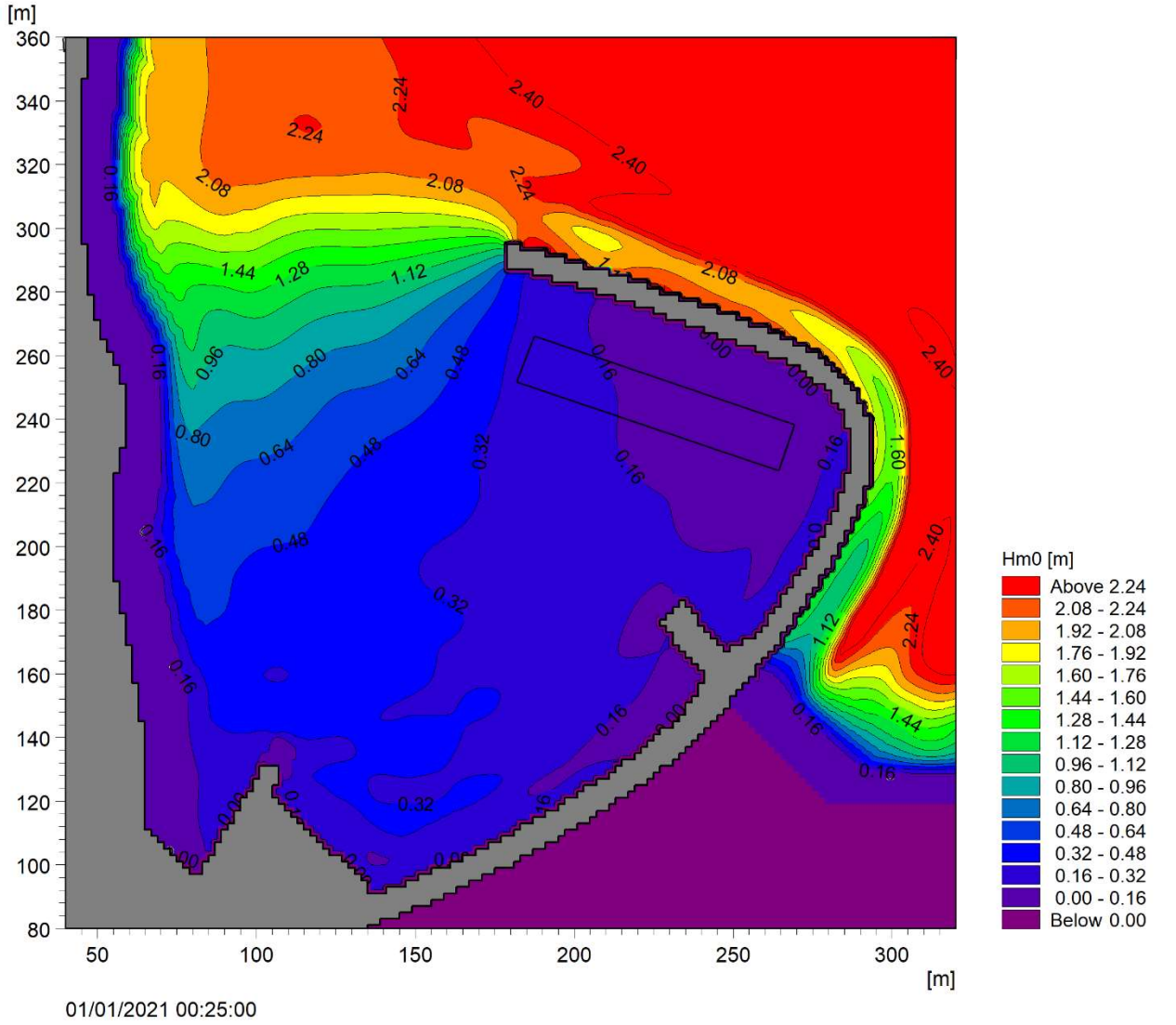


Figure 10 Significant wave heights – 1 in 1 year return period storm from the north with wave generation cross the North Minch

3.5 Conclusions of the wave disturbance studies

In terms of wave attenuation within the harbour basin, the proposed Radical East Option for Staffin Harbour has performed noticeably better than any of the other harbour layouts proposed to date. With this option the wave climate within the proposed marina area is within the limits normally considered acceptable for the berthing of small vessels. The wave climate at the proposed new slipway is also expected to be suitable for use in virtually all weathers.

It should be noted however that the modelling undertaken does not include for wave disturbance from large overtopping waves and thus the conclusion from this study assume that the breakwater will be designed to prevent excessive wave overtopping during storms at high water levels.

4 Impact of Radical East Option scheme on Sediment Transport

4.1 Methodology

Sediment can be moved around a coastal area under the combined action of waves and littoral currents, where littoral currents result from the combined action of tide, wind and wave driven currents. In high wave energy situations or places where there are strong littoral currents, sand sediment is usually not present and the bed material comprise shingle, stones, boulders or rock, as the sand it easily stripped away by the combination of high storm waves and strong littoral current.

At Staffin most of the foreshore comprised gravel, boulders and rock. There are also rocky reefs and a steep underwater bank aligned along the eastern edge of the bay. All these areas are largely devoid of sand sediment due to the either the high energy storm wave climate or the very strong littoral currents or a combination of both. There is an area of sand immediately to the north of the existing breakwater and slipway which results from an eddy in the littoral currents and only a small amount of wave breaking in this area.

In view of the complexity of the seabed around Staffin harbour, the assessment of the impact of the proposals on the sediment transport regime have been studies by modelling the wave climate and the littoral current regime for both the existing breakwater/slipway and for the proposed REO scheme. This technique enables the impact of the scheme on the overall coastal processes to be established and particularly on the processes that are governing the distribution of sediments around the area.

As storm waves are a significant driver for the movement of sediments in this area, the analysis has been undertaken over a neap-spring tidal cycle for three different 1 in 1 year return period storm

directions (15º, 60º and 105º). In addition, the analysis has considered the effect of the littoral current generated by the neap and spring tides combined with the annual average wave conditions.

4.2 1 in 1 year return period storm from 15º over a spring and neap tide

Figure 11 shows the significant wave heights and the mean wave directions for a 1 in 1 year return period storm from 15ºN at high water neap tide. It will be seen that there is a large decrease in wave heights at the entrance to the bay and over the reefs as well as along the foreshore along the coast immediately to the north of the existing slipway.

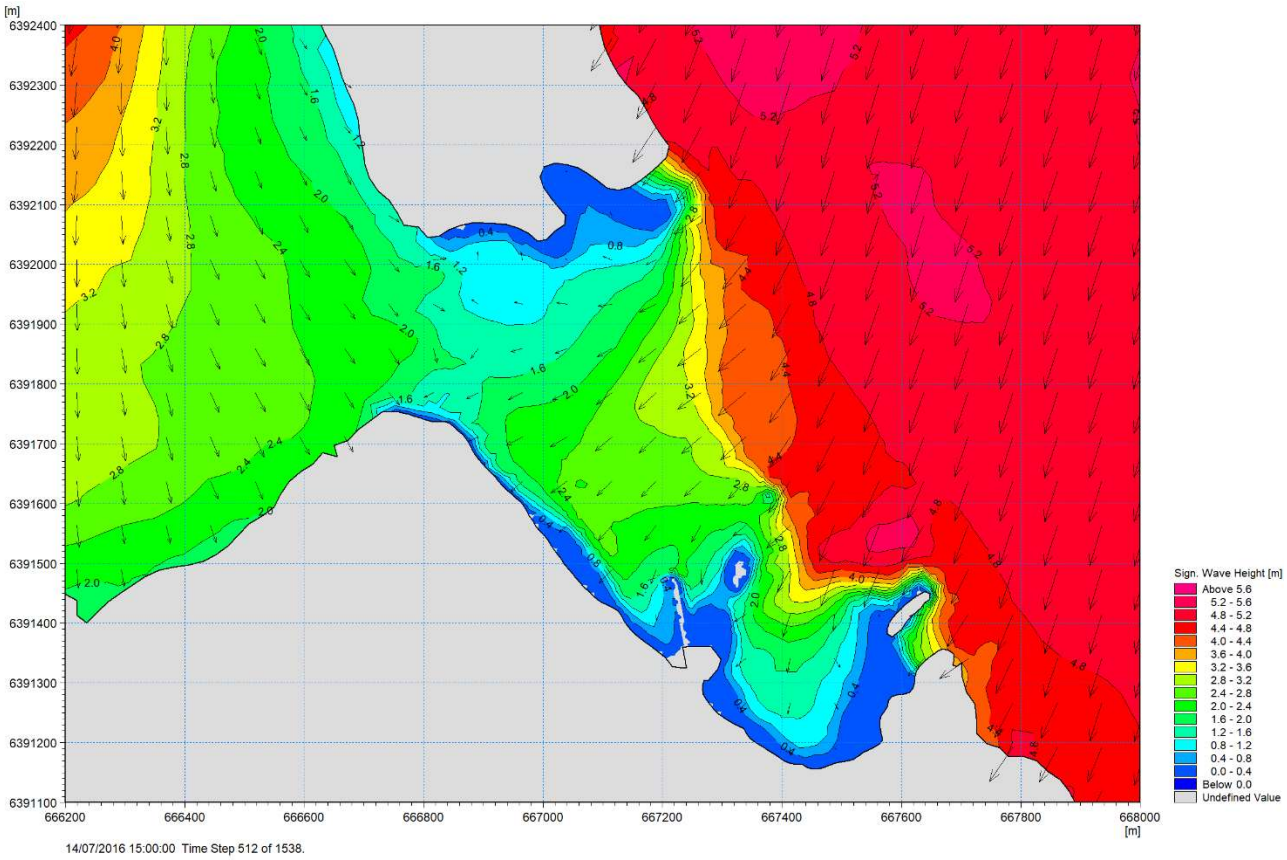


Figure 11 Significant wave height and mean wave direction – 1 in 1 year return period storm from 15º at highwater neap tides

The mean littoral current regime (over the neap tide) associated with this 1 in 1 year storm are shown in Figures 12 for the existing (top) and proposed REO option (bottom). It will be seen that there are high littoral currents at the entrance to the bay, over the reef and along the foreshore which results in a clockwise circulation around the bay to the north of the existing breakwater/slipway. A similar pattern is seen for both the existing and the REO scheme. The equivalent littoral current regimes are shown for the 1 in 1 year storm from 15º at spring tides in Figure 13.

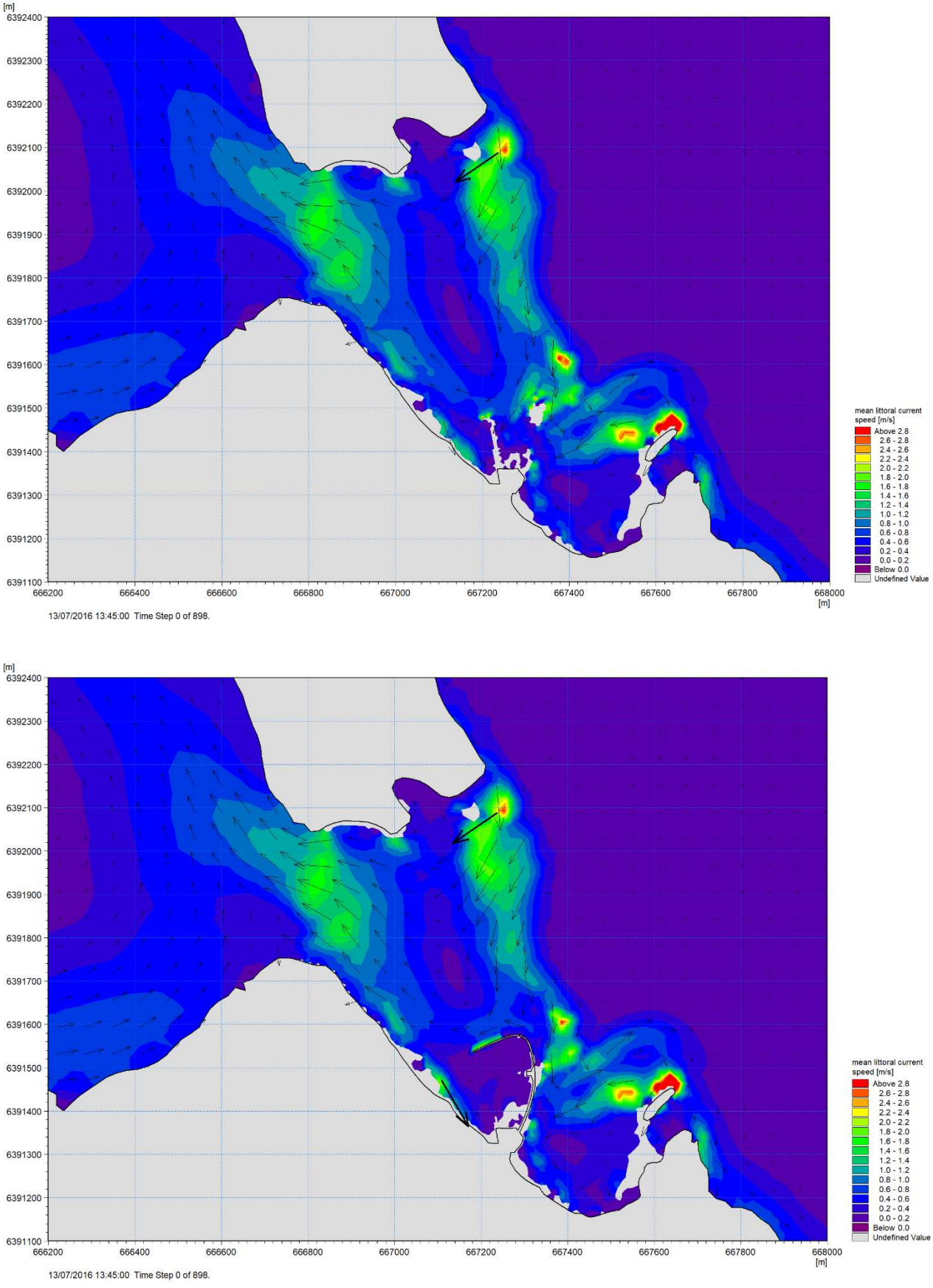


Figure 12 Mean littoral current neap tide flows for 1 in 1 year storm from 15º - Existing breakwater/slipway (top) and REO harbour (bottom)

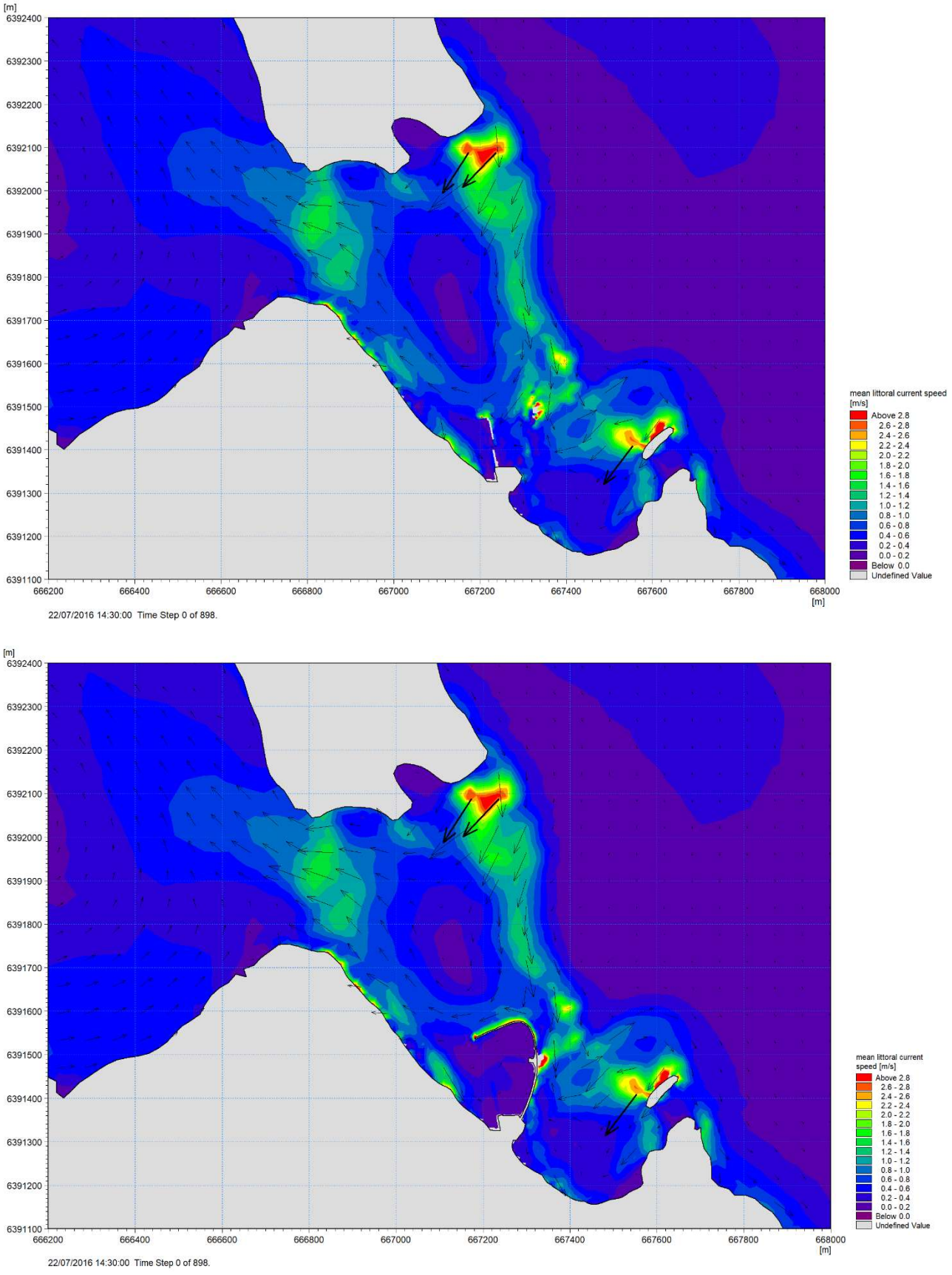


Figure 13 Mean littoral current spring tide flows for 1 in 1 year storm from 15° – Existing breakwater/slipway (top) and REO harbour (bottom)

It will be noted from Figure 12 and 13 that the pattern of the littoral currents during the neap and spring tides is similar and also that the there is only a small difference in the overall current patterns between the existing and the REO harbour layouts. The main difference is that the southern end of the clockwise gyre is a little further north with the REO harbour due to the location of the breakwater.

4.3 1 in 1 year return period storm from 60º over a spring and neap tide

Figure 14 shows the significant wave heights and the mean wave directions for a 1 in 1 year return period storm from 60ºN at high water neap tide. It will be seen that, similarly to the storm from 15º, there is a large decrease in wave heights at the entrance to the bay and over the reefs as well as along the foreshore along the coast immediately to the north of the existing slipway.

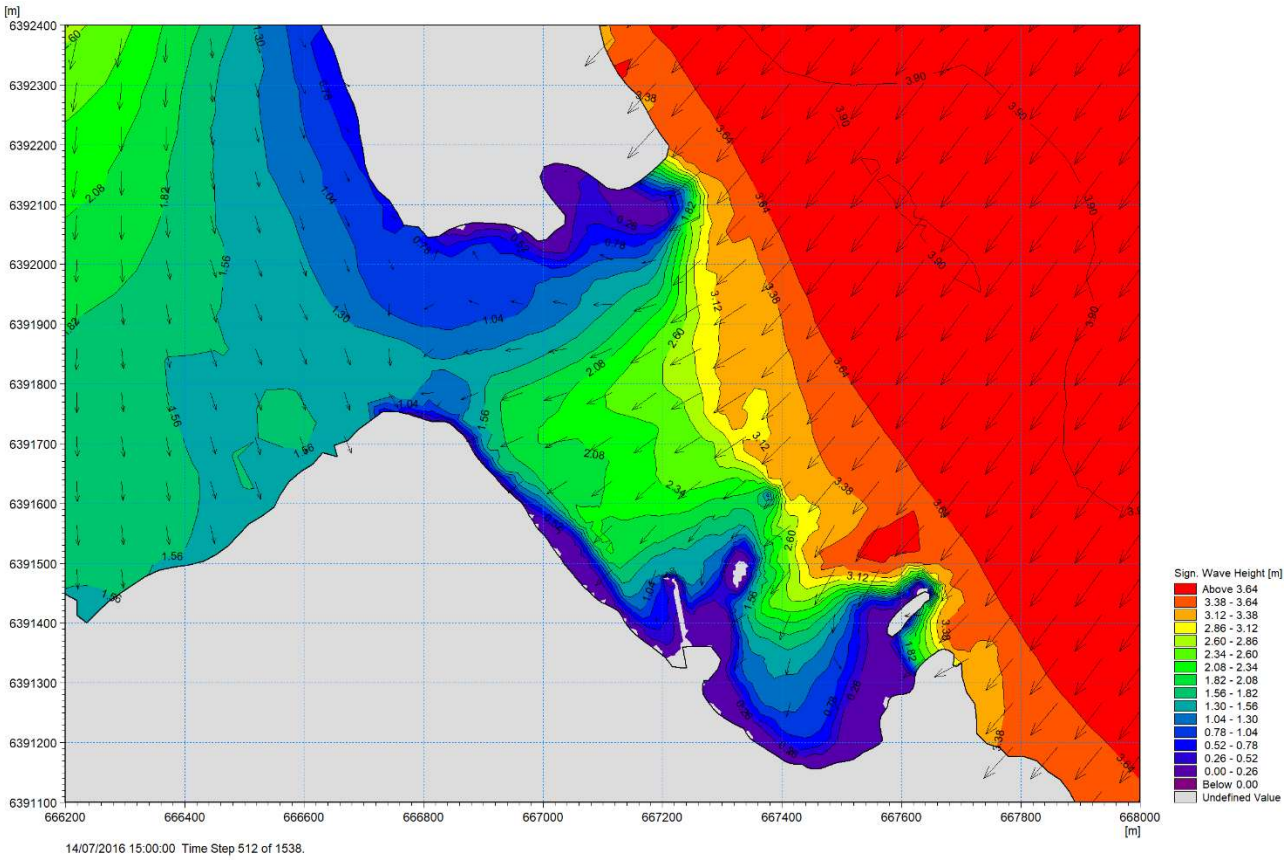


Figure 14 Significant wave height and mean wave direction – 1 in 1 year return period storm from 60º at highwater neap tides

The mean littoral current regime over a neap tide and a spring tide associated with this 1 in 1 year storm are shown in Figures 15 and 16 for the existing (top) and proposed REO option (bottom). It will be seen that similar to the storm from 15º, there are relatively high littoral currents that at the entrance to the bay, over the reef and along the foreshore which results in a partial clockwise circulation around the bay to the north of the existing breakwater/slipway.

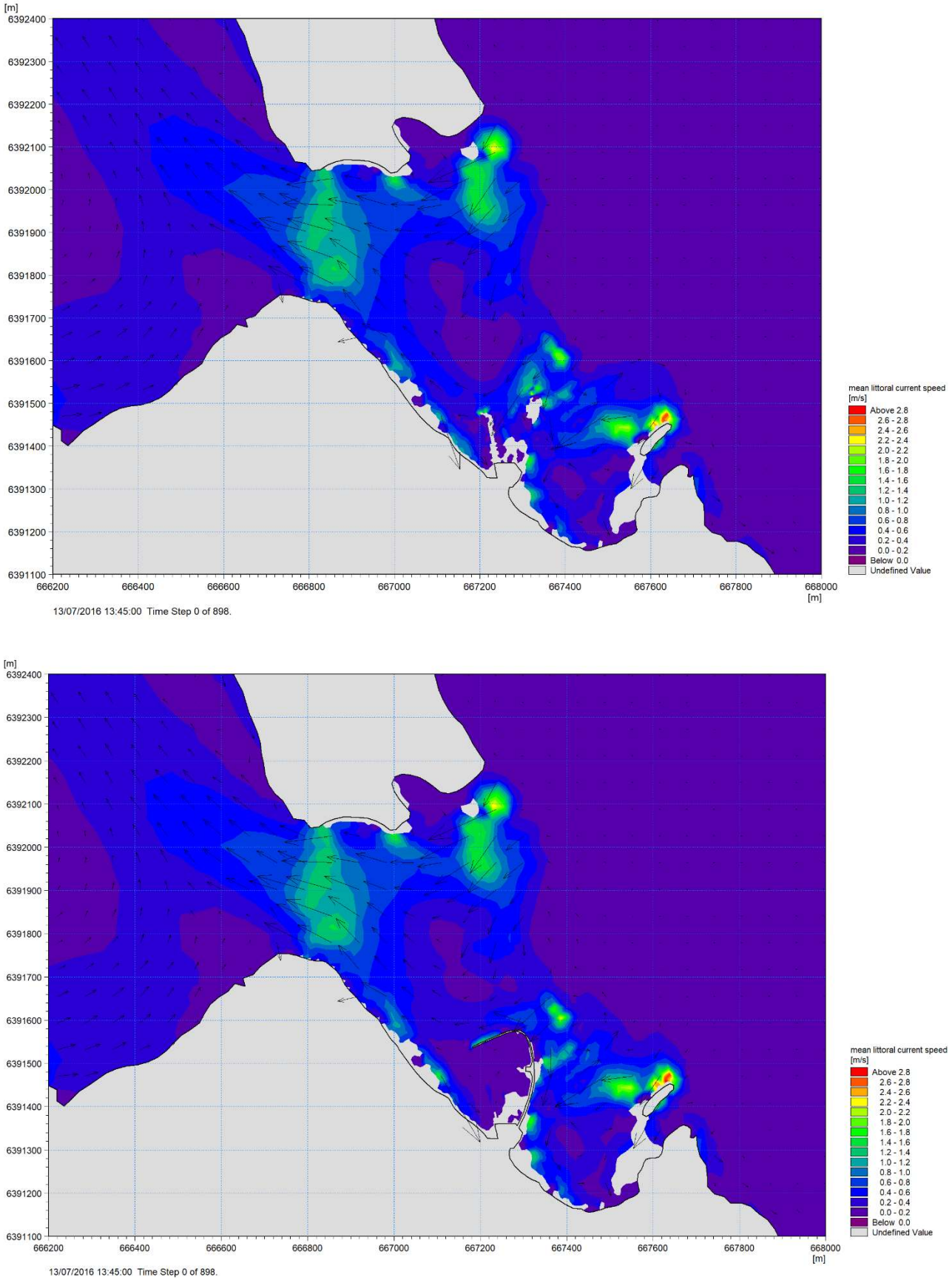


Figure 15 Mean littoral current neap tide flows for 1 in 1 year storm from 60° - Existing breakwater/slipway (top) and REO harbour (bottom)

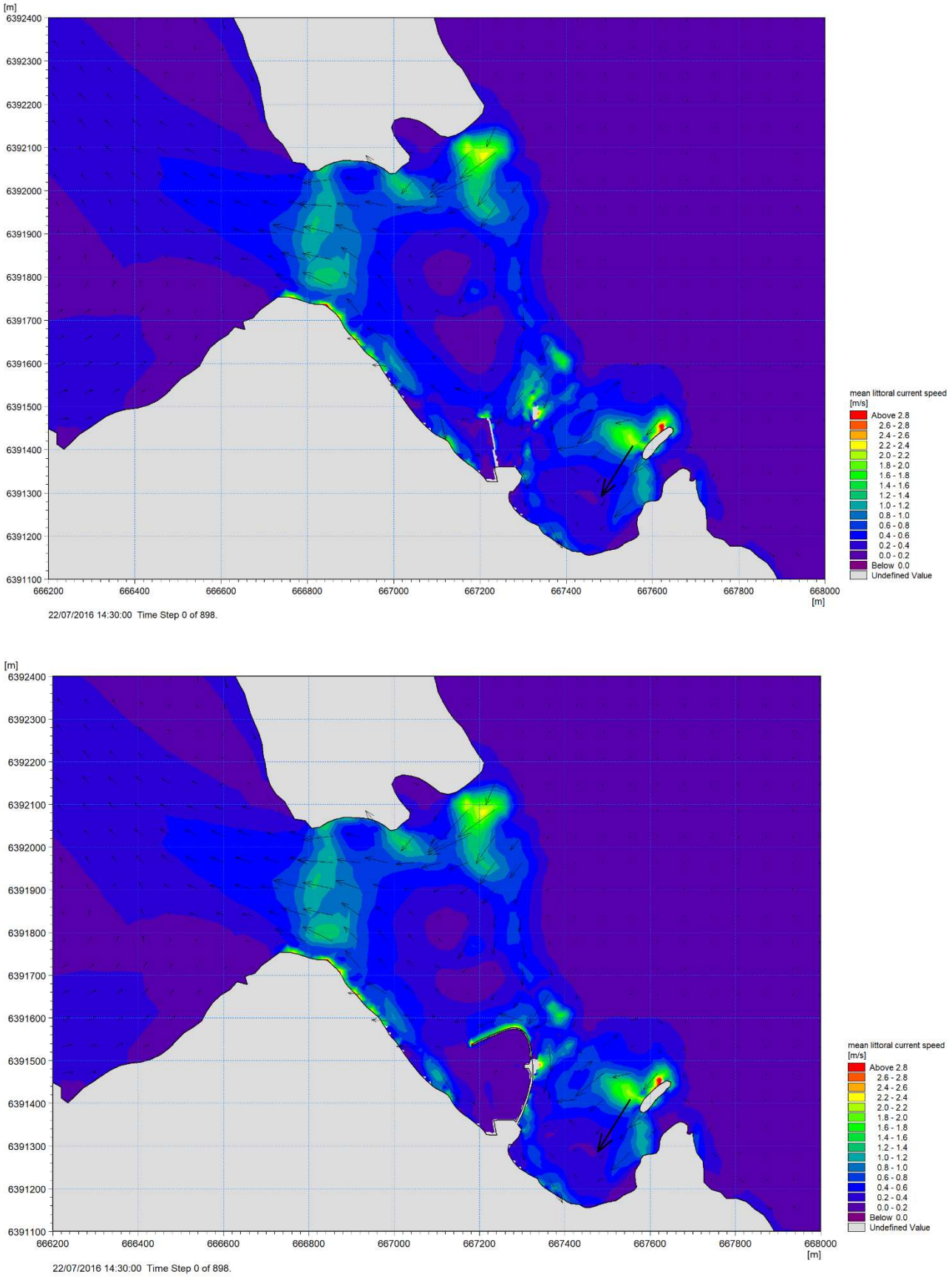


Figure 16 Mean littoral current spring tide flows for 1 in 1 year storm from 60° – Existing breakwater/slipway (top) and REO harbour (bottom)

It will be seen from Figures 15 and 16 that the pattern of the littoral currents during the neap and spring tides is similar and also that the there is only a small difference in the overall current patterns between the existing and the REO harbour layouts. The main difference is that the southern end of the clockwise gyre is a little further north with the REO harbour due to the location of the breakwater.

4.4 1 in 1 year return period storm from 105° over a spring and neap tide

Figure 17 shows the significant wave heights and the mean wave directions for a 1 in 1 year return period storm from 105°N at high water neap tide. It will be seen that as the 1 in 1 year storm waves from 105° are noticeably lower in wave height than those during storms from 15° and 60°, there is not the same decrease in wave heights at the entrance to the bay and over the reefs as in the simulations with the other storm directions.

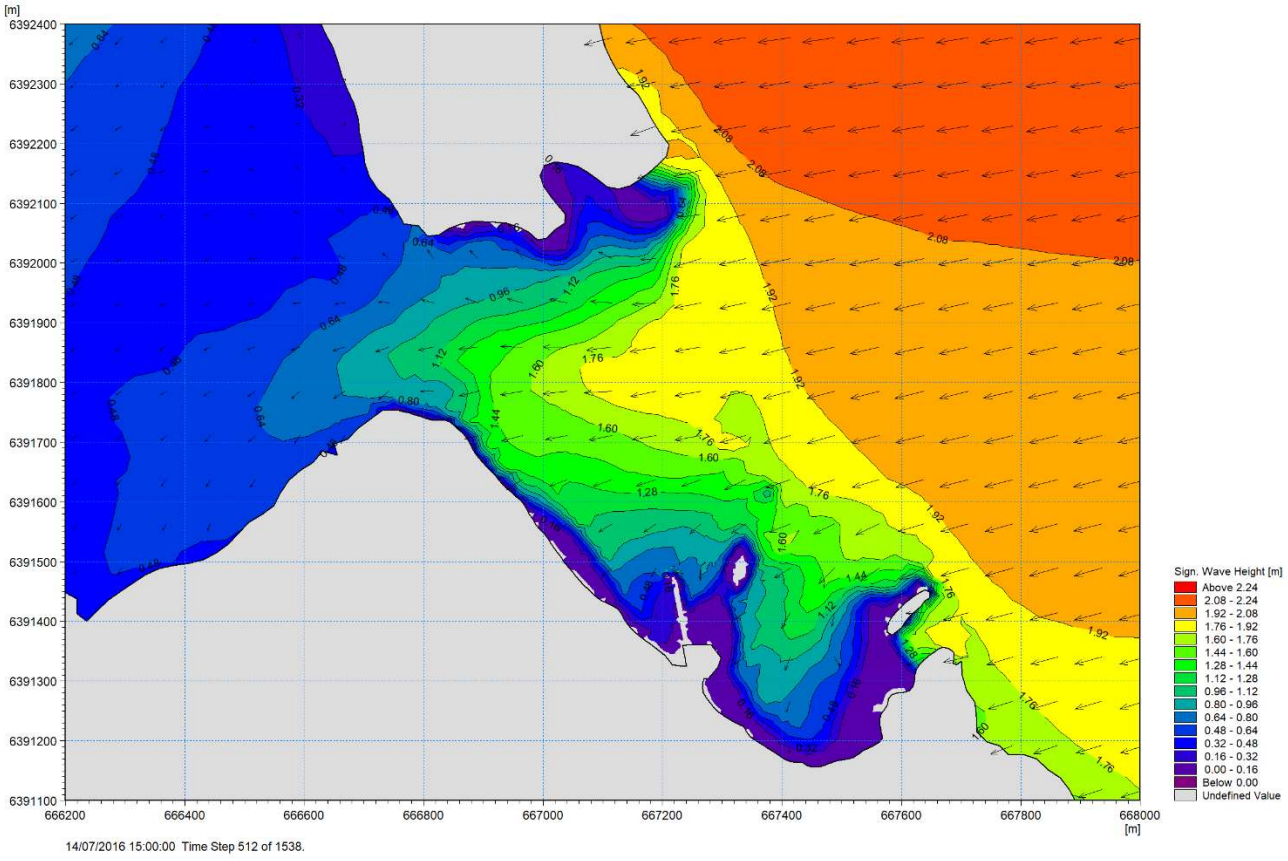


Figure 17 Significant wave height and mean wave direction – 1 in 1 year return period storm from 105° at highwater neap tides

The mean littoral current regime over a neap tide and a spring tide associated with this 1 in 1 year storm are shown in Figures 18 and 19 for the existing (top) and proposed REO option (bottom). With this storm direction the littoral currents generally flow from east to west across the bay to the north of the existing breakwater/slipway and are noticeably lower that with the larger storm waves from the 15° and 60° directions.

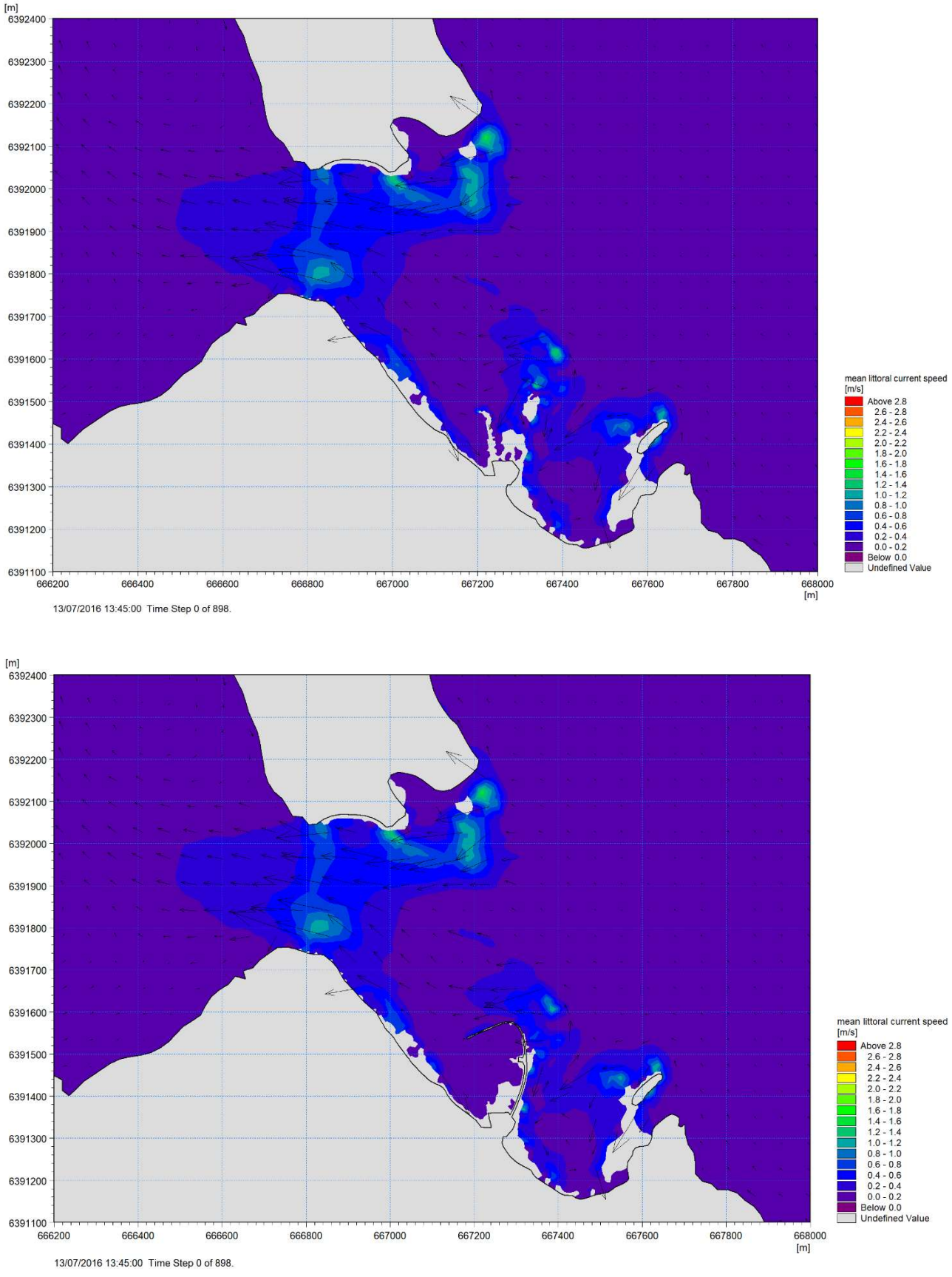
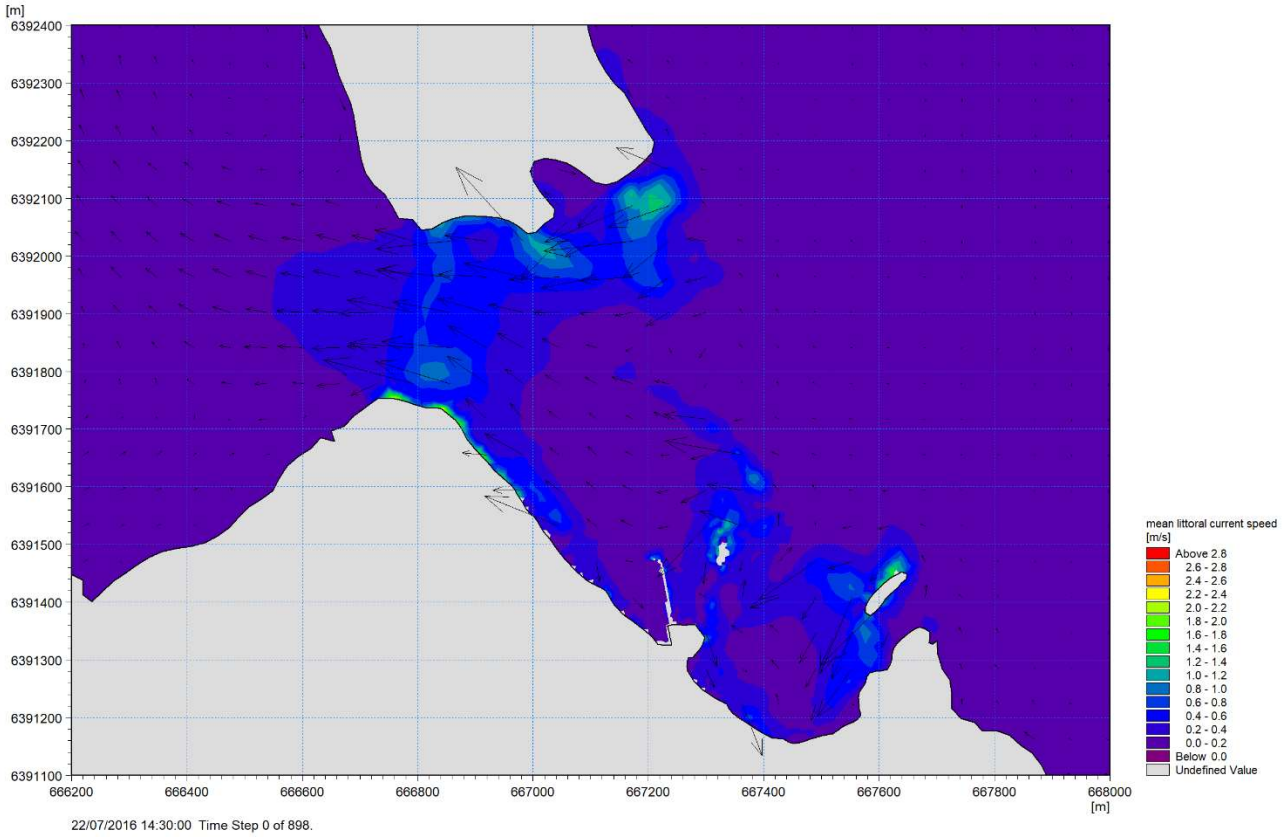


Figure 18 Mean littoral current neap tide flows for 1 in 1 year storm from 105º - Existing breakwater/slipway (top) and REO harbour (bottom)



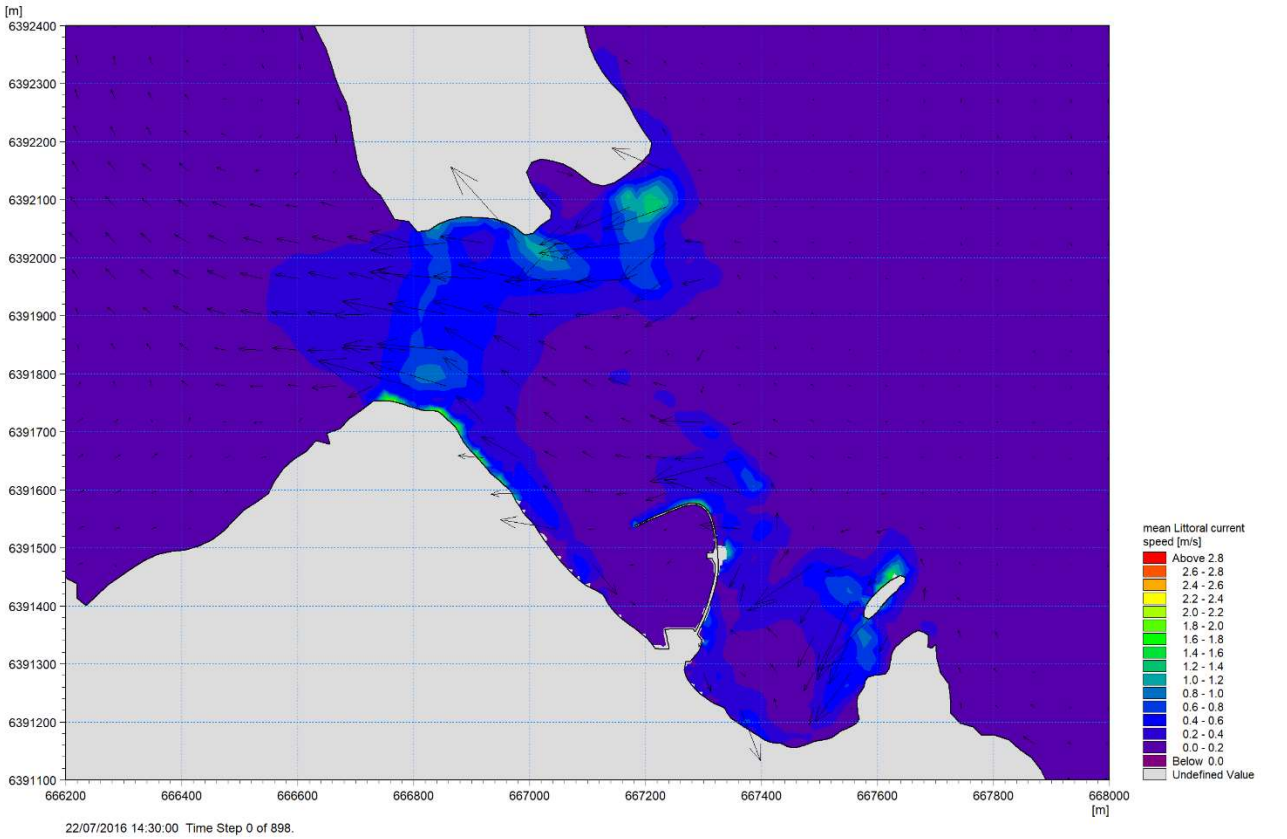


Figure 19 Mean littoral current spring tide flows for 1 in 1 year storm from 105° – Existing breakwater/slipway (top) and REO harbour (bottom)

It will be seen from Figures 18 and 19 that the pattern of the littoral currents during the neap and spring tides is similar and also that the there is virtually no difference in the overall current patterns between the existing and the REO harbour layouts for this storm direction.

4.5 Spring tide with annual average wave climate

A 10 year time series simulation of hourly wave climate values showed that the average wave climate approaching Staffin would have a significant wave height of about 0.48 metres with a wave period of about 4.3 seconds. This wave climate was used with a spring tide flood and ebb flow to ascertain the likely impact of the proposed REO layout on the sediment transport regime during small wave events.

The simulations were undertaken for both the existing breakwater/slipway layout and for the REO Staffin harbour layout. The comparison of the littoral current regimes during spring flood tides is shown in Figure 20 with the flow regime for the existing breakwater/slipway shown in the upper diagram and for the REO Staffin harbour layout in the lower diagram. It will be noted that the littoral current flow velocities are very much smaller than those for the 1 in 1 year return period storms. In addition, there are only very minor difference in the spring flood flow patterns between the existing breakwater/slipway layout and the REO harbour layout.

The comparison of the littoral current regimes during spring ebb tides is shown in Figure 21 with the flow with flow regime for the existing breakwater/slipway shown in the upper diagram and for the REO Staffin harbour layout in the lower diagram. It will be seen from Figure 21 that the ebb tide flow patterns are not affected by the proposed REO harbour layout and thus there is no significant difference in the flow patterns shown in the upper and lower diagrams in Figure 21.

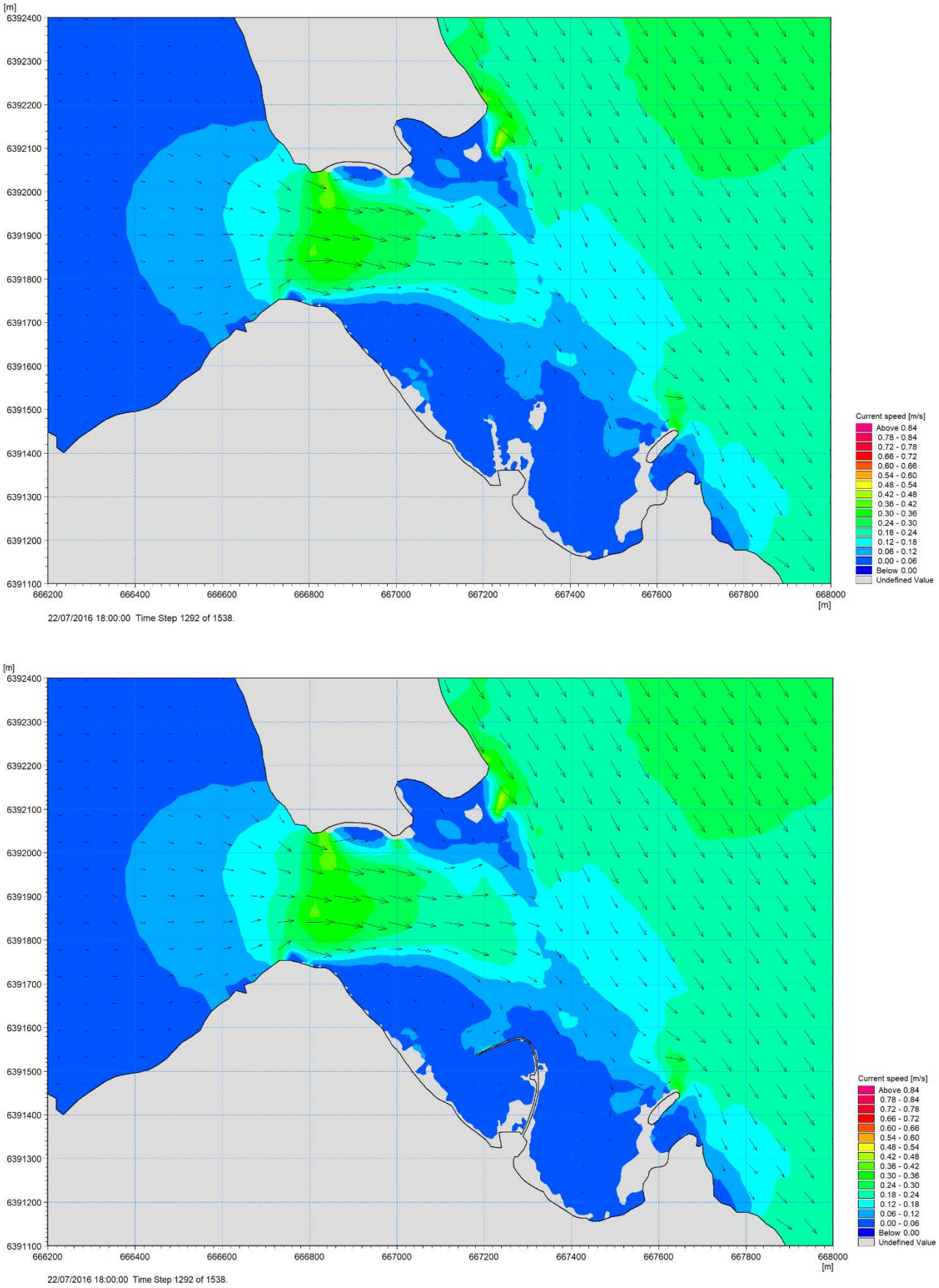


Figure 20 Mean spring tide flood flows with average wave climate - Existing breakwater/slipway (top) and REO harbour (bottom)

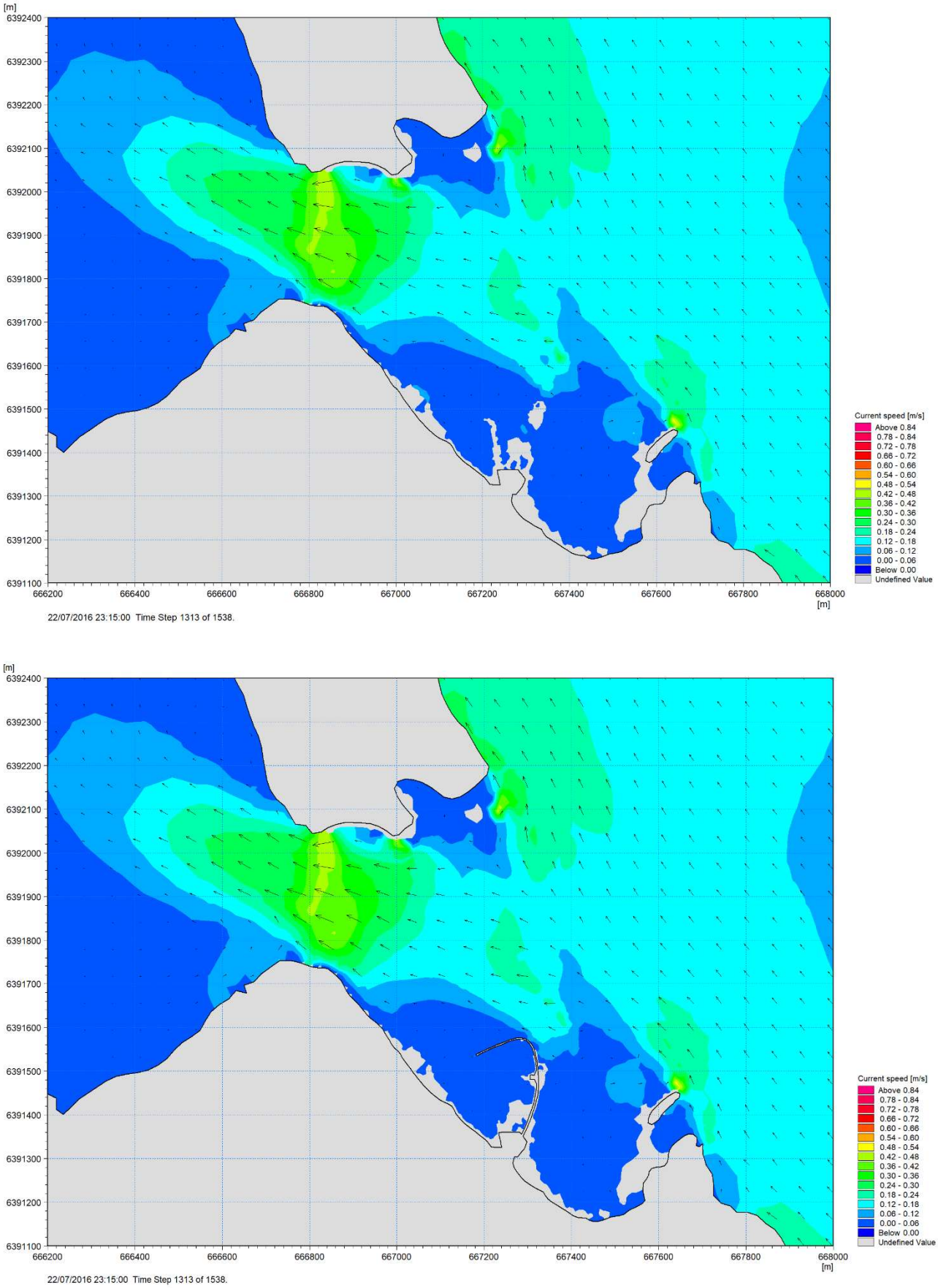


Figure 21 Mean spring tide ebb flows with average wave climate - Existing breakwater/slipway (top) and REO harbour (bottom)

4.6 Conclusions from sediment transport simulations

The simulations of the wave climate and littoral current regime for both the existing breakwater/slipway and the proposed REO Staffin Harbour option have shown that the proposed REO harbour layout will not have an impact on the sediment transport regime of the area away from the immediate location of the proposed harbour.

It is expected that there will be some potential for local scouring along the toe line of the north facing section of the new breakwater where it is founded on sand during severe north to north easterly storms. The design of the toe of the structures should be adapted to allow it to cater for a local decline in seabed levels during severe storms.

Although there is no direct pathway for the sand which lies to the north of the harbour to enter into the harbour and marina basin area, fine suspended material will potentially settle out in this sheltered part of the harbour. However, as there is normally a low level of suspended sediment in the water around Staffin, the siltation rate is expected to be similar to the rate which has occurred behind the existing breakwater/slipway and will be mainly associated with north to north easterly storms which only occur for about 0.1% of the time in an average year.

5 Wave Climate for REO Breakwater Design

Model simulations have been run for 1 in 100 and 1 in 200 year return period storm at high water spring tides and at high water spring tides plus sea level rise of 0.89 metres. The simulations have been undertaken for storm directions from 345º to 045º including swell from Atlantic storm and for wave generation across the North Minch only for storm directions 330º to 135º. The results of these simulations have been extracted for seven points along the toes of the breakwater at locations shown in Figure 22. The wave climate at each of the seven points for the 1 in 100 and 1 in 200 year return period storm are given in the accompanying Excel spreadsheets.

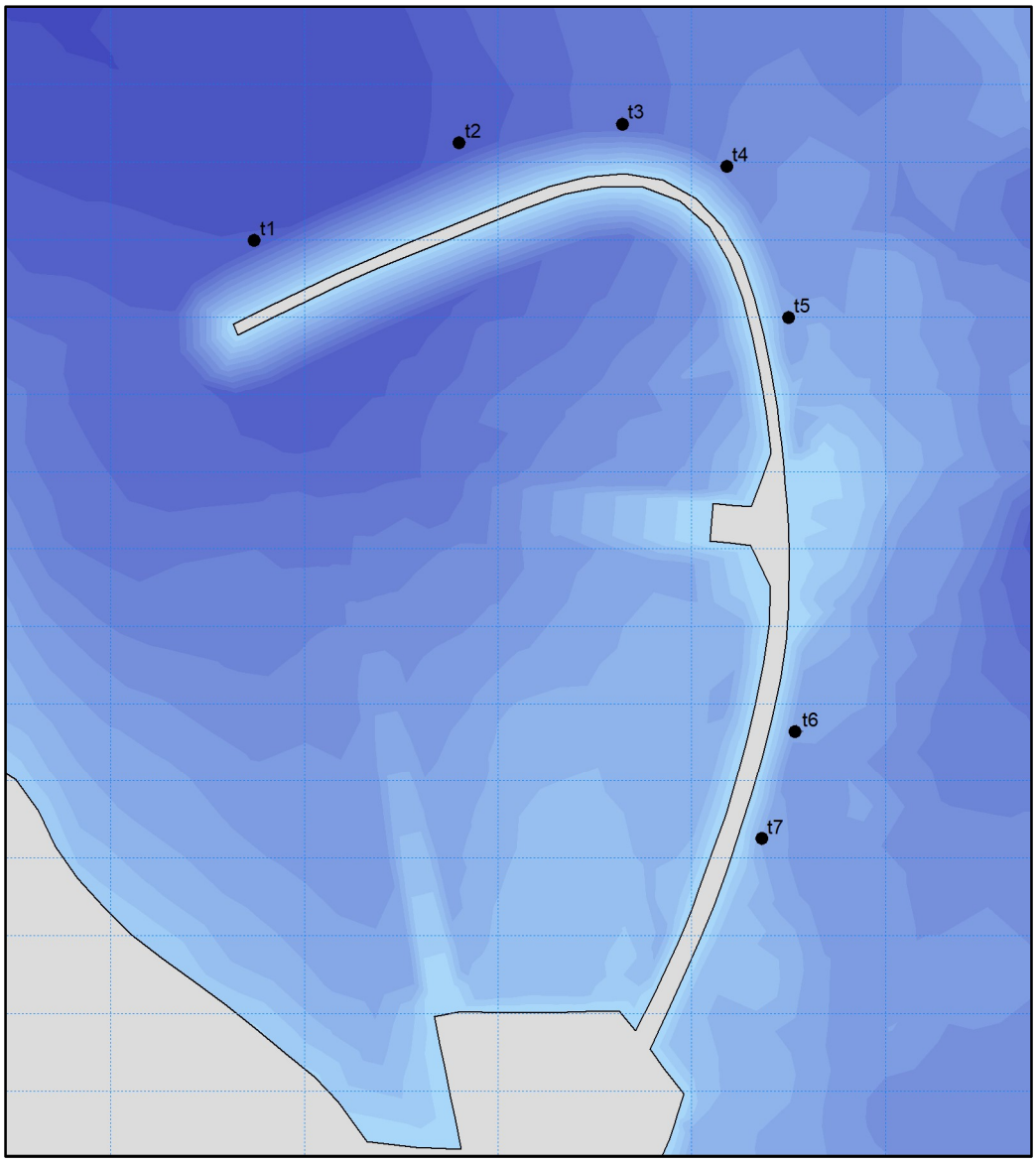


Figure 22 Location of wave climate points along the toe of the proposed REO breakwater at Staffin (see Excel sheets)

Appendix R.1: Socioeconomic Profile of Staffin

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Staffin Slipway

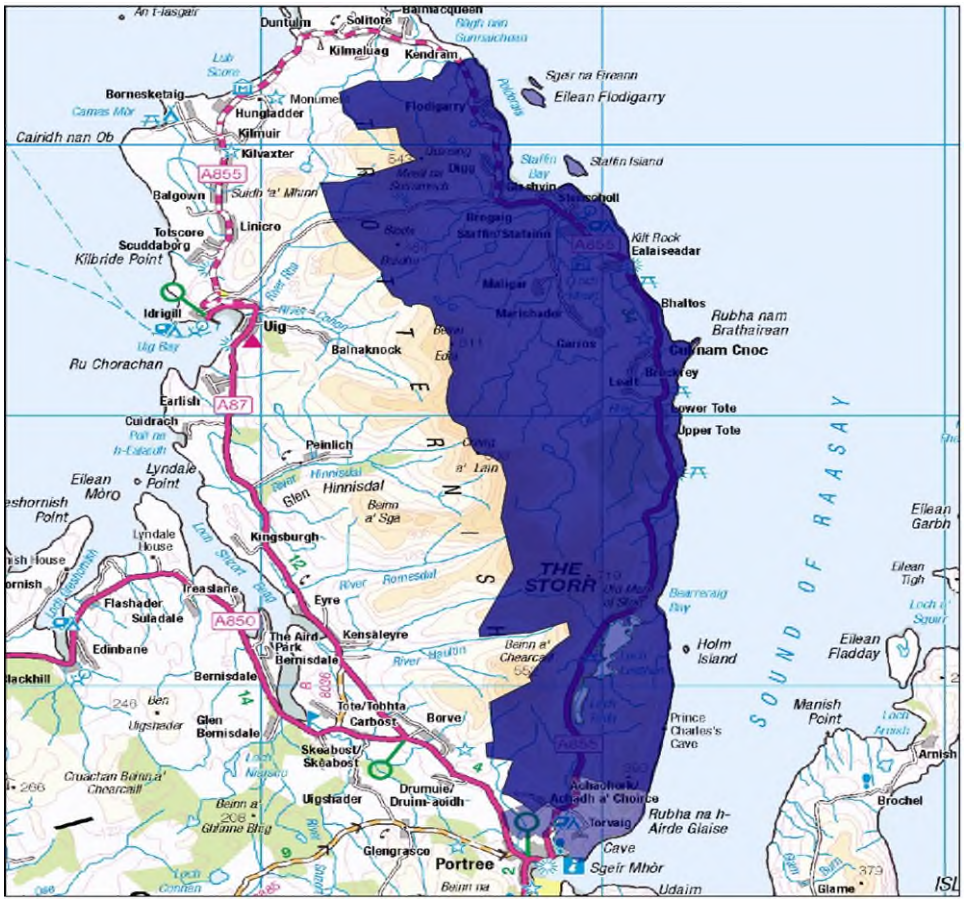
Socioeconomics of Staffin

September 2021

2.0 SOCIO-ECONOMIC PROFILE OF STAFFIN

2.1 For the purposes of this analysis, we took the datazone of Skye North East (marked in dark blue on the map below) to represent the Staffin Community Council area, which had a 2011 Census population of 579. Due to changes in methodology, Census data (other than the total population) is only available for the new 2011 datazones. In the case of the Staffin datazone, the new boundary changes increased the size of the datazone, as shown in the whole of the blue shaded area in Map 1.1 below. This larger area had a larger population of 626 in 2011.

Map 1: Staffin Datazones (2001 and 2011 boundary definitions)



Population

Table 1: Population and Recent Population Change

	Persons			Males			Females		
	2011	2019	% Change	2011	2019	% Change	2011	2019	% Change
Staffin	626	678	8.3%	305	350	14.8%	321	328	2.2%
H&I	467,043	469,441	0.5%	229,080	231,187	0.9%	237,963	238,254	0.1%
Scotland	5,299,900	5,463,300	3.1%	2,570,300	2,663,003	3.6%	2,729,600	2,800,297	2.6%

Source: NRS Mid-Year Population Estimates

Table 2: Population Change 2001-2019

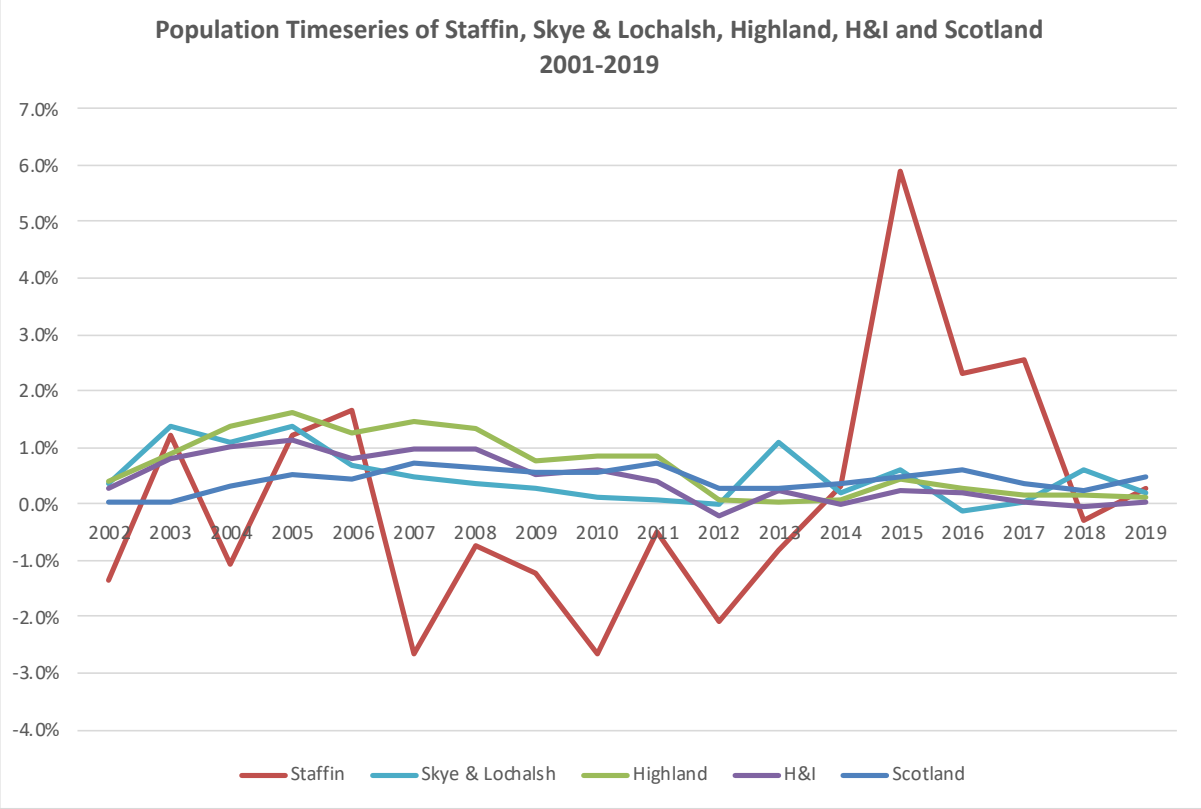
	2001	**2019**	**% Change**
Staffin	666	678	1.8%
Skye & Lochalsh	12,133	13,250	9.2%
Highland	208,920	235,830	12.9%
Highlands & Islands	433,520	469,441	8.3%
Scotland	5,064,200	5,463,300	7.9%

Source: NRS Mid-Year Population Estimates

2.2 Between 2001-2011, the population of Staffin declined by 6%, compared to growth in Skye & Lochalsh (6.4%), Highland (11.4%), Highlands & Islands (7.7%), and Scotland (4.7%). However, between 2011-2019, the population of Staffin grew by 8.3%, compared to smaller increases in Skye & Lochalsh (2.6%), Highland (1.3%), Highlands & Islands (0.5%), and Scotland (3.1%).

2.3 Overall, between 2001-2019, the population of Staffin grew at a lower rate, with 1.8% increase compared to 9.2% in Skye & Lochalsh, 12.9% in Highland, 8.3% in Highlands & Islands, and 7.9% in Scotland.

Chart 1: Population Changes 2001-2019



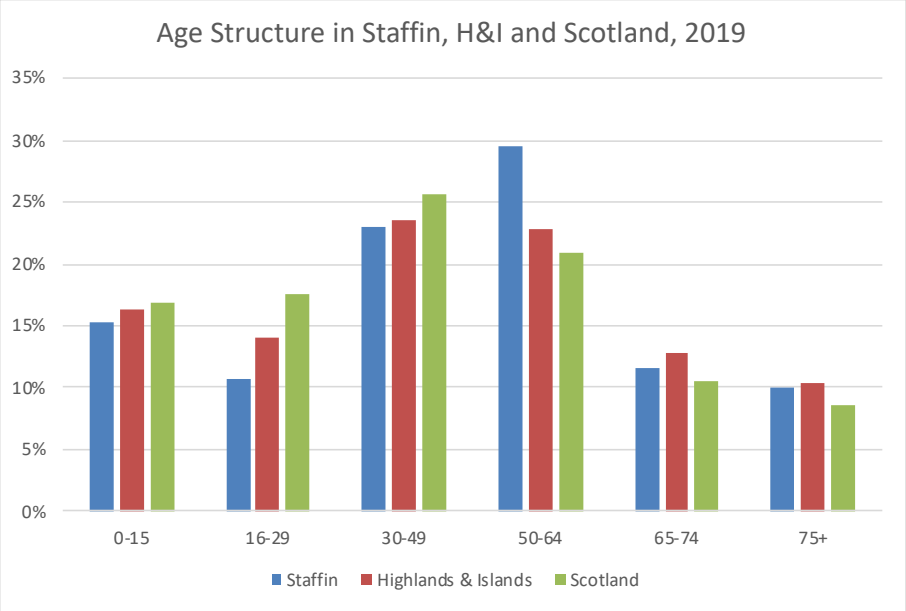
2.4 The age structure of Staffin is relatively elderly and ageing, as demonstrated in Table 3 and Chart 2 below, with more than 50% of Staffin's population aged over 50 compared to 46% in the Highlands & Islands and 40% in Scotland as a whole.

Table 3: Age Structure

	Staffin		H&I		Scotland	
	2019	Age Structure %	2019	Age Structure %	2019	Age Structure %
All Ages	**678**		**469,441**		**5,463,300**	
0-15	103	15.2%	76,868	16.4%	921,397	16.9%
16-29	73	10.8%	66,253	14.1%	955,977	17.5%
30-49	156	23.0%	110,223	23.5%	1,402,875	25.7%
50-64	200	29.5%	107,170	22.8%	1,138,906	20.8%
65-74	78	11.5%	60,163	12.8%	578,300	10.6%
75+	68	10.0%	48,764	10.4%	465,845	8.5%

Source: NRS Mid-Year Population Estimates

Chart 2: Age Structure 2001-2019



2.5 Population projections produced by The Highland Council, using 2016 population figures as the starting point, estimate that the Skye and Lochalsh area will increase by 11.8% to 2041. The highest increases are those aged over 65 years, and particularly those aged 75 years and above – projected to be 20% of the total population by 2041. The increases are based on an expectation of small annual net migration, as natural population change is estimated to continue to decline. The working age population, aged 16-64, is predicted to decline by -7.0%.

Table 4: Population Projections, 2016-2041

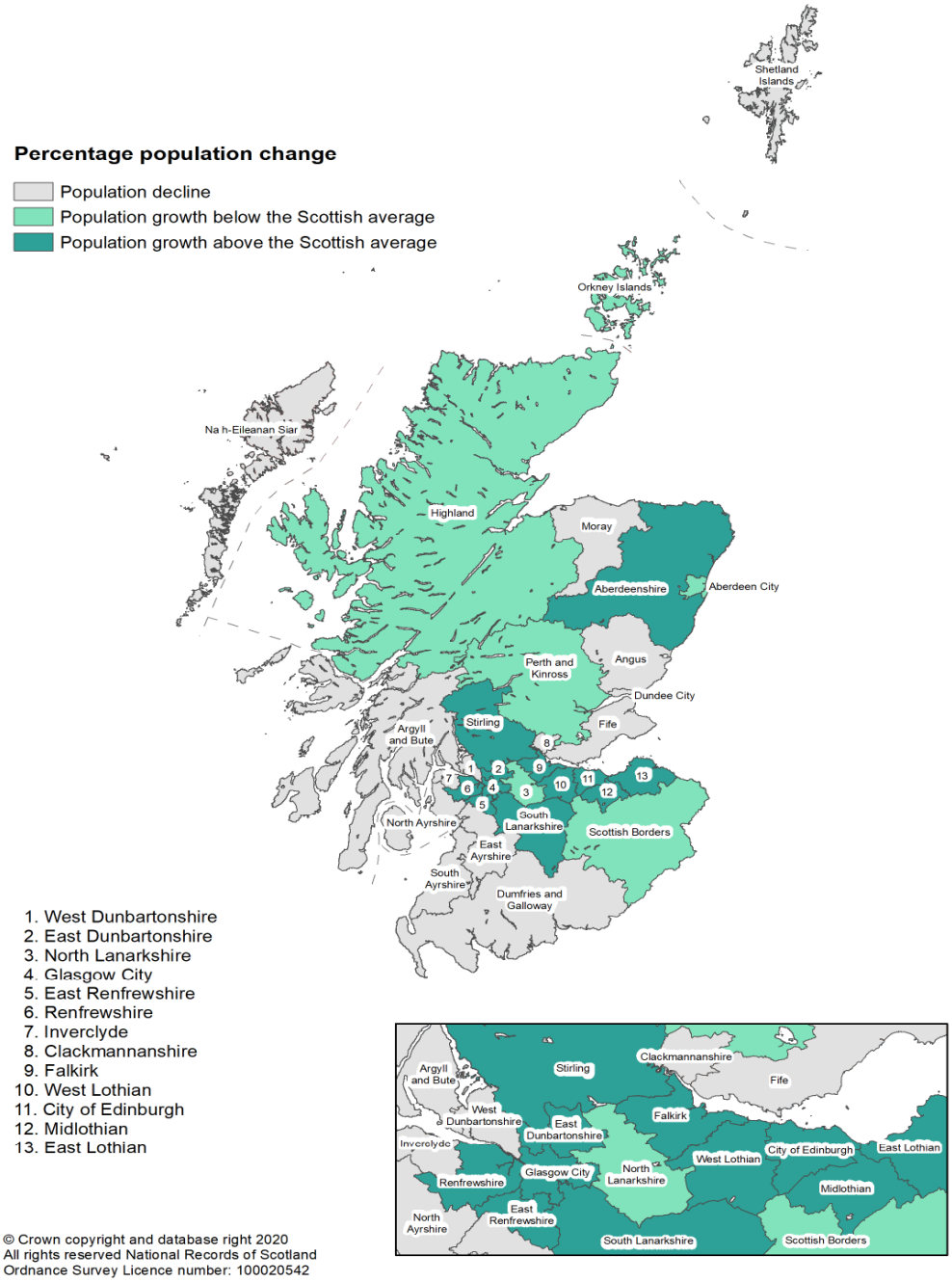
Age	**2016**	**2041**	**% Change 2016-2041**
0-4	531	572	7.7%
5-15	1,463	1,453	-0.7%
16-24	1,092	975	-10.7%
25-44	2,477	2,510	1.3%
45-64	4,460	3,983	-10.7%

65-74	1,895	2,185	15.3%
75+	1,218	3,009	147.0%
Total	**13,136**	**14,687**	**11.8%**
Working Age	8,029	7,468	-7.0%
Age 65+	3,113	5,194	66.8%

Source: The Highland Council Population Projections (2016-based)

2.6 The map below displays the projected percentage change in population across different council areas in Scotland between mid-2018 and mid-2028, showing Highland as one of the areas with below average growth.

Map 2: Projected percentage change in population, by council area, mid-2018 to mid-2028



Economic Activity and Employment Structure

2.7 As shown in Table 5 below, the percentage of working households is lower in Skye, Lochaber and Badenoch than in the Highlands & Islands and Scotland as a whole. Also, the number of working households with children under 16 and dependent children is higher in Skye, Lochaber and Badenoch.

Table 5: Households by Combined Economic Activity Status, 2019

	Skye, Lochaber & Badenoch		Highlands & Islands		Scotland	
	No.	%	No.	%	No.	%
All households	19,800	100.0	122,400	100.0	1,806,100	100.0
Working households	10,600	53.6	67,500	55.2	1,056,100	58.5
Children under 16	*3,900*	*81.1*	*31,900*	*67.9*	*552,000*	*63.0*
Dependent children	*4,200*	*71.7*	*34,000*	*64.6*	*568,600*	*58.4*
Mixed households	6,900	35.1	37,900	31.0	431,000	23.9
Employed and inactive	6,500	32.6	34,100	27.8	381,100	21.1
Workless households	2,200	11.3	16,900	13.8	319,000	17.7
All inactive	1,800	8.9	14,600	12.0	280,200	15.5

2.8 As shown in Table 6 below, the economic activity rate in Staffin is similar overall to the Highlands & Islands average, with a relatively low proportion of full-time employees and a relatively high proportion of self-employment.

Table 6: Economic Activity by Type, 2011

	Staffin		LSWR	Highlands & Islands	Scotland
	No.	%	%	%	%
All people aged 16 to 74	507				
Economically active: Employee: Part-time	80	16.9	15.3	15.3	13.3
Economically active: Employee: Full-time	148	31.4	34.9	39.4	39.6
Economically active: Self-employed	78	16.5	15.8	10.9	7.5
Economically active: Fulltime Student	4	0.8	1.5	1.9	3.7
Economically active: Unemployed	23	4.9	3.7	3.8	4.8
Unemployed people: Aged 16 to 24	3	0.6	0.9	1.1	1.4
Unemployed people: Aged 50 to 74	13	2.8	1.0	0.9	0.9
Unemployed people aged 16 to 74: Never worked	0	0.0	0.2	0.3	0.7
People aged 16 to 74: Long-term Unemployed	6	1.3	1.2	1.3	1.8
Total Economically Active	**333**	**70.6**	**71.3**	**71.3**	**69.0**

Source: 2011 Census of Population

Table 7: Economic Inactivity by type, 2011

	Staffin		LSWR	Highlands and Islands	Scotland
	No.	%	%	%	%
Economically inactive: Retired	83	17.6	17.3	16.8	14.9
Economically inactive: Student	12	2.5	3.0	3.2	5.5
Economically inactive: Looking after home or family	11	2.3	3.5	3.5	3.6
Economically inactive: Long-term sick or disabled	18	3.8	3.5	3.6	5.1
Economically inactive: Other	15	3.2	1.5	1.6	1.9
Total Economically Inactive	**139**	**29.4**	**28.7**	**28.7**	**31.0**

Source: 2011 Census of Population

Table 8: Economic Activity (2020)

	Skye, Lochaber and Badenoch		Highlands & Islands		Scotland	
	No.	%	No.	%	No.	%
Economic activity rate - aged 16-64	33,300	76.2	218,500	79.5	2,644,400	76.8
Employment rate - aged 16-64	31,700	72.7	212,800	77.5	2,528,400	73.5
% aged 16-64 who are employees	24,300	55.6	181,000	65.9	2,242,500	65.2
% aged 16-64 who are self employed	7,100	16.3	30,900	11.3	278,800	8.1
Unemployment rate - aged 16-64	1,600	4.7	5,700	2.6	116,000	4.4
Unemployment rate - aged 16+	1,800	5.0	6,200	2.6	117,500	4.3
% who are economically inactive - aged 16-64	10,400	23.8	56,200	20.5	797,300	23.2
% of economically inactive who want a job	2,600	24.9	13,400	23.8	182,100	22.8
% of economically inactive who do not want a job	7,800	75.1	42,800	76.2	615,200	77.2
% with no qualifications (NVQ) - aged 16-64	2,500	5.7	16,900	6.2	274,700	8.0

Source: 2020 Annual Population Survey

2.9 As shown below, Staffin residents are dependent on work in accommodation and food service activities – reflecting the importance of tourism.

Table 9: Employment by Sector, 2019

	Staffin		LSWR	H&I	Scotland
Industry Categories	**No.**	**%**	**%**	**%**	**%**
Agriculture, forestry and fishing	0	0.0	4.9	12.2	3.3
Mining and quarrying	0	0.0	0.2	0.4	1.1
Manufacturing	0	0.0	5.4	6.1	6.5
Electricity, gas, steam and air conditioning supply	0	0.0	0.3	0.6	0.7
Water supply, sewerage, waste management & remediation activities	0	0.0	0.7	1.0	0.7
Construction	0	0.0	6.1	6.5	5.5
Wholesale & retail trade, repair of motor vehicles & motorcycles	20	10.0	12.0	12.7	13.3
Transport and storage	30	15.0	4.6	4.9	4.1
Accommodation and food service activities	**75**	**37.5**	**25.2**	**11.8**	**8.2**
Information and communication	0	0.0	1.2	1.6	3.3
Financial and insurance activities	0	0.0	1.0	0.7	3.2
Real estate activities	10	5.0	2.2	1.2	1.5
Professional, scientific and technical activities	10	5.0	3.3	4.5	7.1
Administrative and support service activities	0	0.0	2.8	4.1	7.8

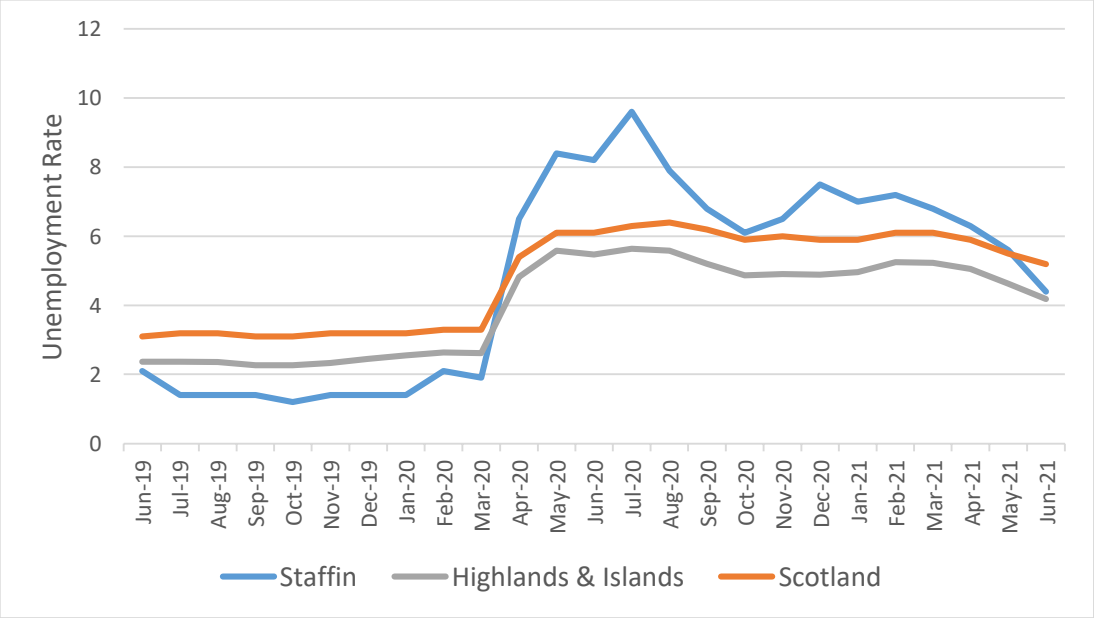
Public administration and defence, compulsory social security	20	10.0	4.1	5.7	6.0
Education	0	0.0	8.8	6.9	7.9
Human health and social work activities	45	22.5	12.1	15.5	15.4
Arts, entertainment, and recreation	0	0.0	4.0	2.9	2.7
Other service activities	0	0.0	0.9	1.2	1.7

Source: BRES 2019

Unemployment

2.10 As shown below, unemployment in Staffin was relatively low prior to Covid-19 – which in part reflected young people and others leaving the area to improve their employment prospects. However, the impacts from Covid-19 are highlighted in the chart below showing significant increases in unemployment since March 2020.

Chart 3: Unemployment Rate for Staffin, H&I and Scotland, June 2019-June 2021



Source: NOMIS Claimant Count

Deprivation

2.11 Deprivation in relation to employment and geographical access are particularly marked in Staffin – reflecting its HIE Fragile Area status.

Table 10: Scottish Index of Multiple Deprivation, 2020

	Staffin	Scotland
Number income deprived	73	654,561
% of total population income deprived	10.8%	12.3%
Number employment deprived	39	324,791
% of those 16-64 employment deprived	8.8%	9.6%
Geographic Access domain rank (out of 6,976 datazones)	51	-
Housing domain rank (out of 6,976 datazones)	2,625	-
Education domain rank (out of 6,976 datazones)	3,801	-
Health domain rank (out of 6,976 datazones)	3,208	-

Source: SIMD 2020

Housing

2.12 As shown below, the increase in the number of residential properties in Staffin has overtaken growth in the wider Highlands region. Coupled with the lower population growth in Staffin, this suggests an increase in holiday homes and/or in single person households as the population ages.

Table 11: Dwellings, % Change, 2014-2020

	Total no dwellings: 2014	Total no dwellings: 2020	% Change 2014-2020
Staffin	363	383	5.5%
Skye North East	1,879	1,918	2.1%
Highland	114,960	120,163	4.5%
Scotland	2,546,383	2,660,863	4.5%

Source: Scottish Neighbourhood Statistics

2.13 Tenure statistics below show a preponderance of detached properties in Staffin, with 73.2% compared to 21.5% in Scotland as a whole.

Table 12: Household Type, 2017

	Staffin		Skye, Lochaber & Badenoch		Highland		Scotland	
Total no. of dwellings	**381**		**38,149**		**117,607**		**2,603,174**	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Detached	279	73.2%	18,601	48.8%	48,690	41.4%	558,911	21.5%
Flats	16	4.2%	3,586	9.4%	15,698	13.3%	980,290	37.7%
Semi-Detached	35	9.2%	7,902	20.7%	28,074	23.9%	511,583	19.7%
Terraced	12	3.1%	5,871	15.4%	21,081	17.9%	532,963	20.5%
Unknown	39	10.2%	2,189	5.7%	4,064	3.5%	19,427	0.7%

Source: Dwellings by Type, NRS

2.14 As shown below, second home ownership is relatively high in Staffin compared to Scotland as a whole – though not as high as in a number of more accessible scenic locations in the western Highlands.

Table 13: Household Occupation, 2020

	Staffin	LSWR	Highlands and Islands	Scotland
% of Dwellings	**%**	**%**	**%**	**%**
Occupied	89	84	91	96
Unoccupied	11	16	9	4
Second residence/ holiday accommodation	6	14	6	2
Vacant / long-term empty	5	2	3	2

Source: SG Statistics

2.15 With relatively few transactions, the house sale price statistics below might not be representative. In Staffin, the number of house sales has risen by 233% from 3 in 2012 to 10 in 2018, compared to Scotland's 69% rise in house sales over the same period. House prices

have also risen at a faster rate in Staffin between 2012-2018, with a 31% increase in mean house prices compared to Scotland's 15%.

Table 14: Median & Mean House Prices and Sales, 2018

	House Sales 2018	Median Price 2018	% Change from 2016	Mean Price 2018	% Change from 2016
Staffin	10	215,000	4.9%	213,500	-4.3%
Skye, Lochaber & Badenoch	1,340	190,000	11.8%	204,788	9.0%
Highland	4,298	165,000	6.5%	181,613	5.7%
Scotland	100,161	152,500	4.5%	181,457	4.3%

Source: SG Statistics

2.16 Relatively fewer houses are available for rent in Skye, Lochaber and Badenoch than in the comparator areas, which could be a constraint on local employment growth as job opportunities increase.

Table 15: Housing Tenure, 2014-15

	Skye, Lochaber and Badenoch	Highland	Scotland
Owned Mortgage/Loan	26.02%	25.48%	29.33%
Owned Outright	42.42%	40.71%	31.44%
Private Rented	12.02%	12.67%	14.73%
Social Rented	19.54%	20.98%	24.16%

Source: SG Statistics

2.15 Further detail is available in the Affordable Housing Needs Survey 2014 prepared by the Highlands Small Communities Housing Trust – including data from a local household survey with 46 returns.

APPENDIX 1

Yacht Visits to Other Harbours in the Western Highlands and Islands and Berthing Charges

The potential to attract visiting yachts was researched for this report as this brings additional spending into the local economy (especially from overnight stays) and could generate a degree of demand for over-wintering if onshore facilities for this are provided (which can provide useful additional revenue).

In order to assess the possible numbers of visiting yachts that pontoons at Staffin might attract, evidence was obtained from other locations with pontoons in the western Highlands and Islands. Reliable figures are not available for many locations in the Outer Hebrides and Highland where visiting boats berth that are not regularly manned by Council staff.

Tobermory Harbour Association

The twin Hammerhead pontoon provides berthing for up to 50 boats. A "North Arm" has also been added that provides berthing by arrangement only – developed for safe crew access and all tidal berthing for fishing, aquaculture and light commercial. This allows the main pontoons to be accessible for visiting leisure craft.

There are two sections for moorings – visitor and local. Local moorings are popular and there is a waiting list, with approximately 70 spaces. There are 38 visitor moorings of varying weight allowance providing for boats of up to 80 tonnes.

Isle of Harris

Harris Development Limited owns and operates Isle of Harris Marina, with two pontoons: one at Tarbert and one at Scalpay's North Harbour. The new marina opened in 2018, providing a combined total of up to 50 berths which can be increased to 90 across the two sites with rafting.

In 2019, a total of 324 yachts visited the Isle of Harris Marina, an increase of 32% from 246 yachts in 2018. This equated to 590 total yacht nights, an increase of 24% from 2018. Of the two harbours, Tarbert experiences the most visitors with 72% of the total yacht nights. Visitors in 2019 were predominantly from Europe, with over 50% from the Netherlands and France. There were also several commercial visitors and vessels with boats larger than 24m, including four superyachts.

2020 visits were negligible due to the Covid-19 pandemic, and pontoons were removed to make way for dredging works in connection with the Tarbert ferry terminal upgrade. 2021 data is not yet available but suggests there has been a strong rebound, however missing some of the European yachts.

Mallaig Harbour

Mallaig Harbour Authority has a marina with 50 pontoon moorings which opened in September 2011, and numbers of visiting yachts have steadily increased since its first season of operation with 807 different visiting yachts. In the year 2019/20, the harbour reported 1069 different visiting vessels. This is a slight increase on the previous year, with 1042 vessels, but could have been impacted due to Covid-19 in early 2020. This also might explain why the number of nights occupied dropped slightly in 2019/20 after a steady increase each year, with 1429 nights in 2019/20 compared to 1602 in 2018/19. The 2019/20 season included 46 short stays and 56 moorings.

The 2020/21 figures cannot be taken as normal due to the Covid-19 pandemic, with only 553 nights occupied (61% drop) and 360 different visiting vessels (66% drop). The 2021/22 season, however, indicates a recovery, with 858 visiting nights and 582 different vessels from April-July. The marina attendant commented that some visiting yachts this year have been larger and are not ones they would expect to see in a normal year, as a few have travelled from the south of England that would normally have continued south but have instead travelled north due to Covid-19.

- Lochboisdale

The harbour was newly constructed in 2015 and is part of the community owned estate managed by the Stòras Uibhist group of companies that reinvests profits back into the local community. The harbour includes 52 berth pontoons and offers facilities including sheltered moorings, power & water access, boat hoist, toilets &shower block, disabled hoist, laundry facilities, diesel fuel tanks & free wi-fi-. The harbour has an 80m quayside with a 10m slipway.

- Lochmaddy

Offshore facilities, with the capacity to berth 26 vessels, were completed in 2014. The pier is being upgraded as part of the Skye Triangle ferry route that operates between Uig, Lochmaddy and Tarbert, to accommodate a new dual ferry vessel with greater carrying capacity.

- Kyle Harbour

Kyle harbour hosts a variety of cargo, fishing, fish farming, leisure and small-medium sized cruise liners, with leisure facilities including 120m of pontoons at Kyle and Kyleakin, as well as four visitor moorings on the south shore of the loch. A number of commercial leisure craft also operate out of the harbour offering fishing trips or cruises. In the early 2000's, Kyle / Kyleakin were reported to have had 2,000-2,500 visiting yachts, with increases in numbers following the introduction of pontoons. In 2014, Kyle had just 189 boat nights for which payment was received, but an EEF funded project provided berthing for up to 22 vessels from 2015.

- Skye Area

Portree Harbour is a popular destination for cruise liners, and during the summer months cruise liners land their passengers. The harbour is also home to fishing fleets and a salmon farming industry. The main pier is general purpose and used by all. There is an additional mooring berth and slipway for small passenger launches and fish landing. Visitor moorings are operated by Portree Moorings Association and have a minimum weight restriction of 8 tonnes, with 16 moorings available.

Armadale is mostly used by the CalMac ferry and is also a stop on Western Isles Cruises. Numbers of visitor moorings have reduced since the retirement of the Isle of Skye Yachts. Two moorings belong to the Armadale Moorings Committee, with the rest now owned by private users. Of the two owned by the committee, one is under long term hire and one is spare for visitors.

Other moorings available in the area include **Canna**, with 10 moorings for visiting yachts. **Broadford Harbour** Users Association have 6 moorings for use by visiting yachts, and the harbour is used commercially for fishing and other purposes. **Stein** that has a tidal jetty used by the local fishing boats and leisure craft, with four moorings for visiting yachts. **Dunvegan** has 3 moorings, with no power on the pontoon, and users are encouraged not to moor for any longer than time ashore to visit stores

and top up water, to allow all boats to use the facility, except for essential maintenance and disabled access. **Carbost** harbour is operated by the local community, offering overnight berths alongside the refurbished pier, visitor moorings, a launching slipway, and overnight pontoon berths.

There are other pontoon and mooring installations in the wider area – for example at Plockton, Shieldaig, Rona, and on Rum, Eigg, and Muck. Most of these have few facilities and are often served through an honesty box.

- Gairloch

Gairloch has approximately 60 metres of pontoons installed, the with new pontoons actively encouraging visiting boats. It is a working port with both local and east coast fishing boats landing most evenings, and is a busy port for inshore fishing.

- Lochinver

The existing pontoon development, originally installed in the 90s and extended in 2010, was further extended in 2013 to accommodate the growing number of visiting yachts and other pleasure craft, joint funded by Highland Council Harbours and the LEADER Programme. They have about 32 berths for visiting yachts.

- Kinlochbervie

The existing pontoon development that was completed in March 2009 has been further extended in 2013 to accommodate the growing number of visiting yachts and other pleasure craft, joint funded by Highland Council Harbours and LEADER programme. The pontoons can now accommodate an additional 4 visitor berths.

- Stornoway Harbour

The harbour is the main terminal for the CalMac Ferry. For visiting yachts, a new Marina is now available called 'Newton Marina' and can accommodate vessels of up to 24metres in length and 3m draft in all weather conditions. The marina was due to open in early 2020 but Covid-19 delayed the opening to early 2021. There are 75 berths available, including a public slipway for launching of vessels, a 100t boatlift and onshore storage.

- Yacht Sizes

The 'Sailing Tourism in Scotland' report for The Crown Estate, HIE and Scottish Canals in 2016 stated that the most common size of boat is between 9-12m, followed by 5-8m.

- Charges

As shown below, current charges for annual and overnight berthing differ significantly across locations depending on demand, facilities provided, and Local Authority, Harbour Trust or marina operator charging policy. The following charges are for the year 2021/22.

Comhairle nan Eilean Siar annual berthing charges for private leisure craft are relatively inexpensive, ranging from £172 for a vessel up to 5 metres to £36 per metre for a vessel 14 metres or longer

(excluding VAT). A 10-11 metre vessel will pay £328 per annum (excluding VAT). For 6 months, charges are lower, and a 10-11 metre vessel will pay £244 per annum (excluding VAT).

Visiting leisure craft charges are as follows:

	Per Metre
Day Rate	£1.90
Week Rate	£10.35
Month Rate	£21.00
Any vessel making a short stay of up to a maximum of 4 hours between 0800-1800 will be subject to a charge of £5 (excluding VAT), irrespective of size.	

The Highland Council annual berthing charges for private leisure craft are listed below, excluding VAT:

Vessel Length LOA	Group A & B	Group C
Up to 5m	**£275**	**£203**
5.01 to 6m	**£404**	**£226**
6.01 to 7m	**£500**	**£240**
7.01 to 8m	**£604**	**£267**
8.01 to 9m	**£915**	**£297**
9.01 to 10m	**£1,158**	**£303**
10.01 to 11m	**£1,333**	**£439**
11.01 to 12m	**£1,502**	**£569**
12.01 to 13m	**£1,677**	**£702**
13.01 to 14m	**£1,848**	**£831**
14m and above	**£163/m or part thereof**	**£126/m or part thereof**

Six month charges (1st April – 30th September or 1st October – 31st March) excluding VAT:

Vessel Length LOA	Group A & B	Group C
Up to 5m	**£203**	**£137**
5.01 to 6m	**£271**	**£153**
6.01 to 7m	**£333**	**£160**
7.01 to 8m	**£383**	**£183**
8.01 to 9m	**£612**	**£199**
9.01 to 10m	**£773**	**£203**
10.01 to 11m	**£894**	**£292**
11.01 to 12m	**£1,011**	**£381**
12.01 to 13m	**£1,121**	**£469**
13.01 to 14m	**£1,240**	**£560**
14m and above	**£111/m or part thereof**	**£85/m or part thereof**

Note:

- **Group A Harbours:** Lochinver, Kinlochbervie
- **Group B Harbours:** Gairloch, Kyle of Lochalsh & Kyleakin, Portree, Uig, Helmsdale, Portmahomack and Balintore
- **Group C ,D & E Harbours:** Broadford, Sconser, Raasay, Aultbea, Elgol, Old Dornie, Kylesku, John O'Groats, Keiss, Dunbeath, and all other social facilities in these groups

The Highland Council also offer charges for 3 month cruising visits, 1 month cruising visits, 15 day cruising visits and single visits. Costs for these are split by vessel length only, rather than by harbour

groups noted above. Short stays are available for a maximum of 4 hours between 8am-6pm, subject to a charge of £6.09 (including VAT), irrespective of length of vessel.

Mallaig Yachting Marina charge £2.40 per metre per night (including VAT), and £3.60 per night for electricity (including VAT). They charge £12.00 (including VAT) for a short visit of up to 4 hours (2021-22 rates). They do not give concessions for weekend, weekly or monthly stays. Mooring charges are £15 per night, and range from £90 for 1 week up to £1,000 for 12 months (including VAT).

Stornoway Port Authority charge the following rates for pontoon berthing, inclusive of VAT at 20%, for:

- The Inner Harbour:
  - Per day £2.80 per metre (includes electricity)
  - Per week £15.52 per metre (includes electricity)
  - Per month £46.44 (excludes electricity)
  - May-Oct £120 per metre (excludes electricity)
  - Nov-April £62.40 per metre (excludes electricity)
  - Annual charge £172.80 per metre (excludes electricity)

- Newton Marina:
  - Per month £43.20 (excludes electricity)
  - May-Oct £110.40 per metre (excludes electricity)
  - Nov-April £57.60 per metre (excludes electricity)
  - Annual charge £158.40 per metre (excludes electricity)

For the Inner Harbour, the annual charge for a 10 metre boat (including VAT) is thus £1,728, the summer charge £1,200, and the daily charge £28.

Tobermory Harbour charge overnight berthing fees (including water and electricity) at £3 per metre per night, including VAT. Seasonal pontoon stays, for less than 4.5m, are charged at £154.80 including VAT. Visitor moorings are charged at £14 per night for boats less than or equal to 7.5m, and £17 per night for boats larger than 7.5m (including VAT). The harbour also offers 5 night and 10 night tickets, costing £60 or £100 (respectively) for boats less than or equal to 7.5m, and £75 or £140 (respectively) for boats larger than 7.5m.

Oban Marina charges manual check in at £3 per metre, £25 per night for up to 14m, and £35 for larger than 14m (including electricity). Weekly charges are £170 up to 14m and £240 over 14m (including electricity). Annual charge is £350 per metre, 6 monthly pass £255 per metre, 3 monthly summer charge £165.60 per metre, and monthly charge £70 per metre (all excluding electricity).

Holy Loch charge annually £338.33per metre (including VAT) for an outside pontoon berth for boats 7.5m and above. Their overnight rate is £2.75 per metre, and they charge £6 for a stay of up to 4 hours.

Portavadie Marina charge by the berth, based on its size and location in the network, and include VAT. Overnight berthing is charged at £3.30 per metre, £16.80 per metre for weekly, £50.40 per metre for summer monthly, and £25.20 per metre for winter monthly. A Regatta Rate (6 boats or more) offers 10% off overnight rates.

Troon Marina charge annually £365 per metre for boats between 7.9-13.5m (including VAT), £306 per metre for 6 summer months (April-September), and £120 per metre for any 3 consecutive summer months. Visitor berthing is charged at £2.95 per metre for overnight stays, £14.75 for weekly, and

£57.50 per metre for monthly (all including electricity). They also offer a Visitor Berthing Special Offer where visitors can stay 5 nights and receive 2 extra nights free.

Peterhead Bay Marina charge annually £95+VAT per metre, and £13 per night for a vessel up to 6 metres (with an additional £1 per metre thereafter).

Dunvegan Association *charge £15 per day for visitor moorings and £25 per day for pontoon moorings.*

Stein Harbour *charges £10 per night.*

Canna *charge £15 per yacht per night.*

Plockton *charge £15 per night for mooring, irrespective of the size of boat.*