Item: 8

Harbour Authority Sub-committee: 17 March 2020.

1. Recommendations

It is recommended:

1.1.

That the Committee approves the attached minute as a true record.

1.2.

That the Committee considers the recommendations at paragraphs 1.8 and 1.9.

2. Appendix

Draft Minute of the Meeting of the Harbour Authority Sub-committee held on 17 March 2020.

Minute

Harbour Authority Sub-committee

Tuesday, 17 March 2020, 10:30.

Council Chamber, Council Offices, School Place, Kirkwall.

ORKNEY ISLANDS COUNCIL

Present

Councillors Graham L Sinclair, Andrew Drever, Robin W Crichton, David Dawson, Magnus O Thomson and Owen Tierney.

Councillor Rachael A King, who was invited for Item 1.

Clerk

- Angela Kingston, Committees Officer.

In Attendance

- Brian Archibald, Harbour Master.
- David Sawkins, Deputy Harbour Master: Strategy and Support.
- Colin Kemp, Corporate Finance Senior Manager.
- Georgette Herd, Solicitor.
- James Green, Senior Policy Planner (Development and Marine Planning).

Apologies

- Councillor Kevin F Woodbridge.
- Councillors Stephen G Clackson, Alexander G Cowie, Norman R Craigie, Barbara Foulkes, Steven B Heddle, J Harvey Johnston, W Leslie Manson, John T Richards, Stephen Sankey, John A R Scott, Gwenda M Shearer, James W Stockan and Duncan A Tullock, who had been invited for Item 1.

Declarations of Interest

- No declarations of interest were intimated.

Chair

- Councillor Graham L Sinclair.

1. Orkney Harbours Masterplan Phase 1

After consideration of a report by the Executive Director of Development and Infrastructure, copies of which had been circulated, and after hearing a report from the Deputy Harbour Master: Strategy and Support, the Sub-committee:

Noted:

1.1. That the purpose of the Orkney Harbours Masterplan was to provide a structured framework for the physical development and transformation of Orkney's harbours over a 20 year period.

1.2. That, due to the wide geographic spread of the Orkney Harbour Authority area, the Orkney Harbours Masterplan had been split into two phases, with Phase 1 being Scapa Flow and Kirkwall/Hatston and Phase 2 being all other ports/harbours.

1.3. That public consultation, including with stakeholders and industry, had been undertaken in respect of the draft Orkney Harbours Masterplan Phase 1, attached as Appendix 1 to the report by the Executive Director of Development and Infrastructure.

1.4. The responses and feedback from the public consultation on the draft Orkney Harbours Masterplan Phase 1, as detailed in the Consultation Report, attached as Appendix 2 to the report by the Executive Director of Development and Infrastructure.

1.5. That should the draft Orkney Harbours Masterplan Phase 1 be approved, initial feasibility studies, including seabed investigations, would be required in order to provide additional information and facilitate the development of detailed cost estimates for potential projects.

1.6. The proposal to carry out the feasibility studies during summer and autumn 2020, or as soon as possible thereafter, with the cost, estimated at £150,000, being provided for, in full, within the draft Miscellaneous Piers and Harbours revenue budget for 2020 to 2021.

1.7. That, subject to the draft Orkney Harbours Masterplan Phase 1 being approved and the initial feasibility works being completed, it was proposed that the major projects contained within the Masterplan be progressed through the Capital Project Appraisal process during late 2020/early 2021.

The Sub-committee resolved to **recommend to the Council**:

1.8. That the Orkney Harbours Masterplan Phase 1, attached as Appendix 1 to this Minute, be approved as a strategic plan for the Statutory Harbour Authority.

1.9. That, subject to the draft revenue budget for Miscellaneous Piers and Harbours for financial year 2020 to 2021 being approved, the Executive Director of Development and Infrastructure should arrange for initial feasibility studies to be carried out during summer/early autumn 2020, or as soon as possible thereafter, at a cost not exceeding £150,000.

2. Conclusion of Meeting

At 11:30 the Chair declared the meeting concluded.

Signed: Graham L Sinclair.

ORKNEY ISLANDS COUNCIL: ORKNEY HARBOUR AUTHORITY

ORKNEY HARBOURS MASTERPLAN PHASE 1

MARCH 2020

Fisher Associates

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CONTENTS

1. INTRODUCTION

Introduction

Orkney Islands Council (OIC) Harbour Authority appointed Fisher Associates to develop a Harbours Masterplan for Orkney Harbours.

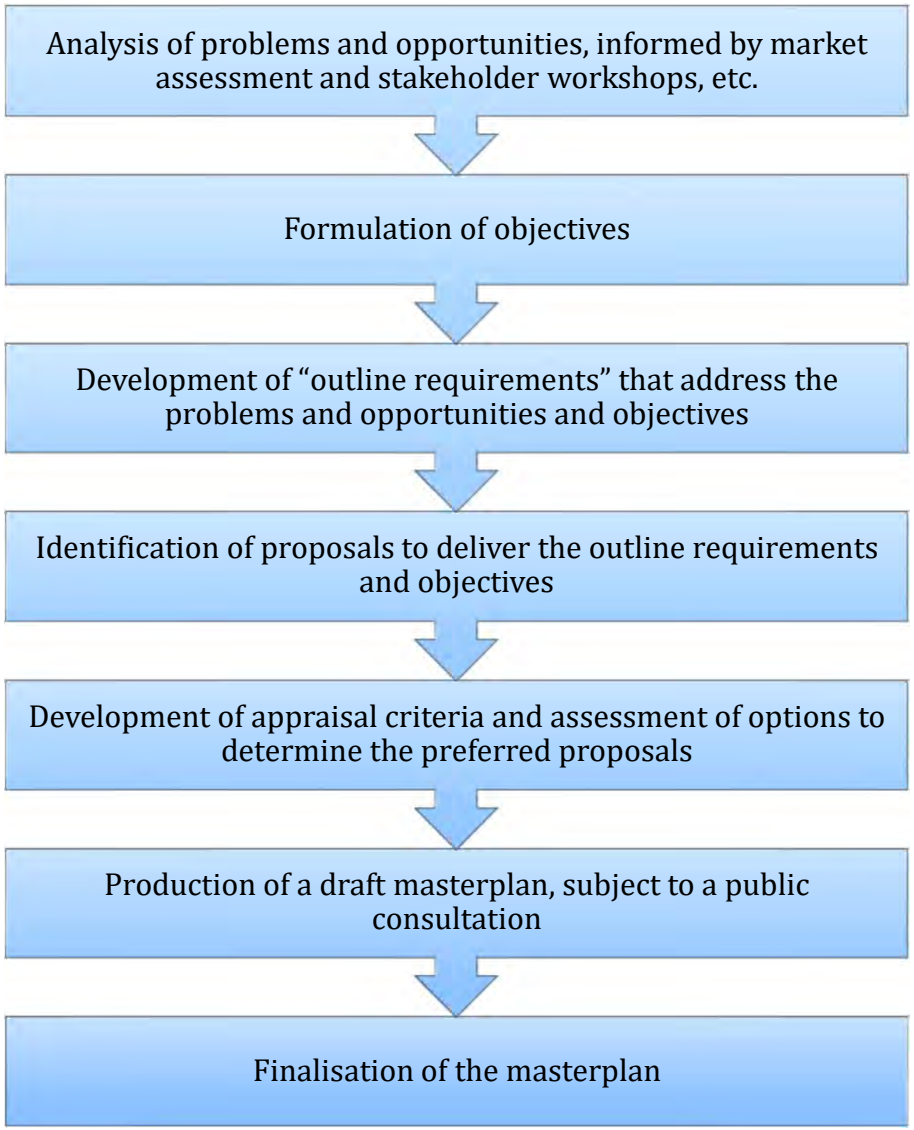
Presented here is the Masterplan Phase 1. There will be a Phase 2, which will cover proposals relating to other piers and harbours on Orkney Mainland and Isles, some of which will be dependent on the outcome of the ongoing Orkney Inter Isles Transport Study (OIITS), and its associated Outline Business Case (OBC). The OIITS will determine the specification for new ferries, which will in turn demand certain requirements from the harbour infrastructure, to be considered when known.

The fundamental purpose of the masterplan is to provide a **structured framework for the physical development and transformation of Orkney's harbours over a 20 year period**. It will enable the Harbour Authority to make informed decisions to meet changing markets, grow new markets, and safeguard Orkney's harbours as essential economic drivers and community assets for future generations. Further diversification and growth in harbour activities will not only safeguard existing jobs at sea and ashore, but create many more and in doing so strengthen the viability and sustainability of the local community for the longer term, making Orkney an attractive place to live, work and do business.

The development of the masterplan has incorporated the following elements:

- **Tailored stakeholder engagement** to explore and validate issues, constraints and potential options.
- Development of a **multi-criteria assessment** framework to consider proposals at a high level.
- **Alignment with Treasury's Greenbook** guidance on the development of Strategic Outline Cases (SOCs) – the content of this masterplan aligns closely with this.

Masterplanning process



Structure of masterplan

Introduction
- Overview of the masterplan process and structure

Strategic Case
- Strategic context (Orkney Harbours / climate change / planning)
- Issues, constraints and opportunities
- Masterplan priorities
- Key drivers and business needs
- Fit with policies and plans
- Outline requirements and masterplan objectives

Masterplan Proposals
- Description of the masterplan proposals and high level costs

Economic Case
- Economic analysis and impacts

Environmental Considerations
- Key findings from the companion Strategic Environmental Assessment (SEA) Report

Management and Commercial Considerations
- Timing and phasing of proposals
- Project dependencies
- Integration with policy and planning framework
- Stakeholder relationships
- Funding and implementation

Appendices
- Appendix A – harbour areas, port premises and permitted development (Phase 1)
- Appendix B – proposed Development Policy Principles
- Appendix C – policy context
- Appendix D – summary of economic benefits
- Appendix E – environmental mitigation and enhancement

Acknowledgements

This masterplan was prepared during 2018 and 2019.

The Harbour Authority and various OIC departments have been central to its preparation, making regular reviews and participating in progress discussions.

We gratefully acknowledge the support of OIC and all stakeholders who have contributed to this work.

FISHER

2. STRATEGIC CASE

Orkney Harbours – an overview

Orkney Islands Council (OIC) is the Statutory Harbour Authority responsible for the safe and efficient operation of the 29 piers and harbours located throughout the Orkney Islands.

The range of ports and harbours is diverse, in terms of structure, size and nature of operational activity.

The major port facilities of Hatston, Kirkwall and Stromness accommodate a range of operational activity across many sectors – aquaculture, cargo, cruise, ferries, fishing, marine leisure and renewables.

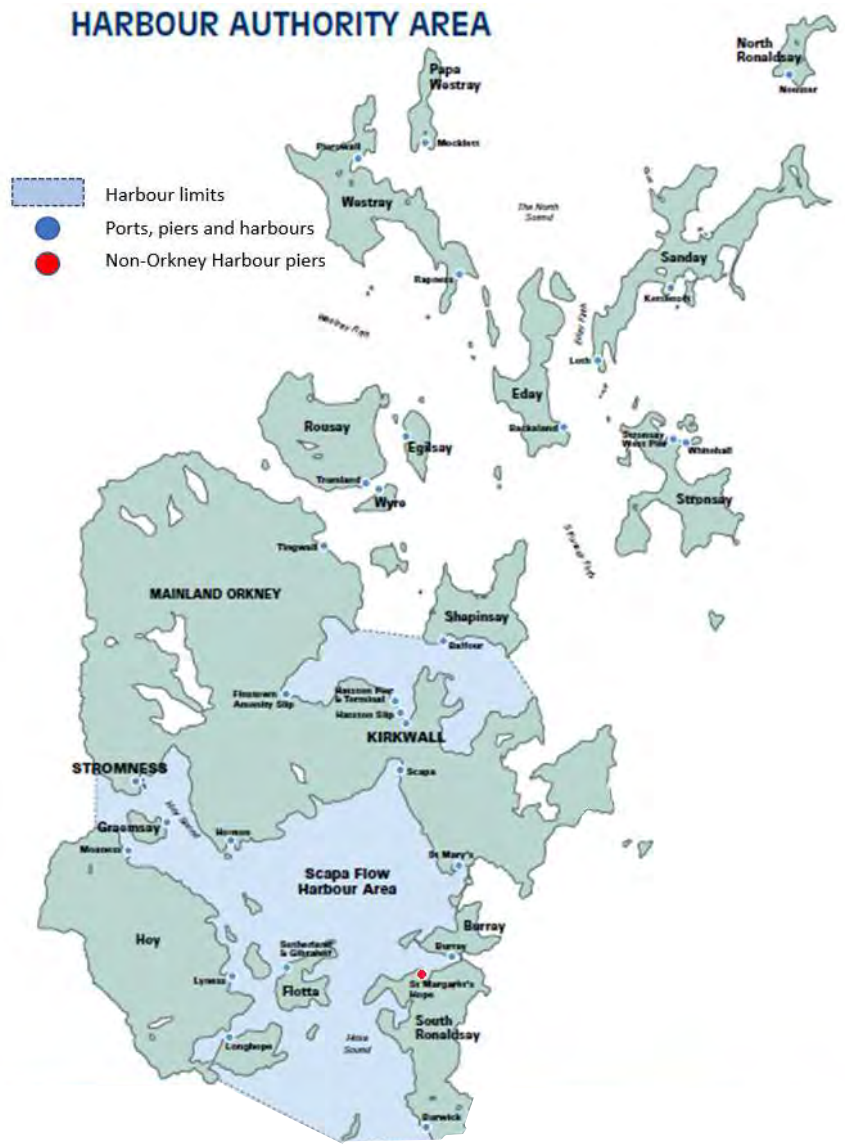
The strategically located Oil Port of Scapa Flow with its unique deep water sheltered anchorage hosts multiple ship to ship (STS) transfer operations of crude oil, liquefied natural gas (LNG) and liquefied petroleum gas (LPG) as well as serving the Flotta Oil Terminal and its connections to oil fields including Claymore, Golden Eagle and Piper. It now also accommodates semi-submersible rigs and accommodation platforms at anchor for maintenance and stand-down.

There are many smaller piers and harbours throughout the North and South Isles as well as across the Orkney Mainland: many of these accommodate life line island ferry services, aquaculture, fishing and marine leisure activities. Many of these piers are critical in ensuring the future viability of island or remote communities.

Recent enhancements to infrastructure include an extension to the Hatston Pier, making it Scotland's longest deep-water commercial berth with 385m of quayside; enhancements to Lyness on Hoy and the construction of a new pier in Stromness, Copland's Dock.

Orkney Harbours has a diverse business base and plays a fundamental role in supporting many key sectors in the Orkney economy and across island communities.

Map of harbours and pier infrastructure in Orkney



Source: Orkney Harbour Authority.

Orkney Harbours – Scapa Oil Port

Scapa Flow has an area of just over 125 square miles and one billion cubic metres of sea water making it the second largest natural harbour in the world.

The Flotta Terminal operation is at the centre of the Scapa Oil Port and has been a key source of revenue for the Harbour Authority. Flotta was identified as the landfall site in 1974 for bringing crude oil ashore by pipeline from nearby oil fields. The Terminal is operated by Repsol Sinopec Resources UK Limited.

The deep sheltered water makes Scapa Flow the perfect location for STS operations at anchor with depths of around 35 metres, as well as providing a suitable location for the positioning of semi-submersible rigs and accommodation platforms during downtimes or for undertaking maintenance activities.

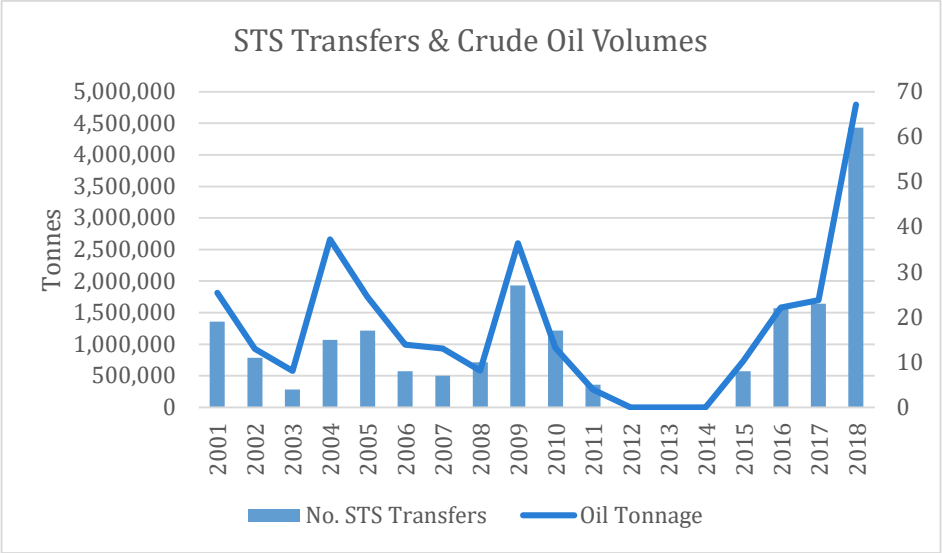
Scapa Flow is currently the pre-eminent location for STS operations in the UK; this plus the handling of offshore platforms and the Flotta Oil Terminal operation requires a broad range of support, logistics, pilotage and towage activity.

STS transfers

The volume of STS operations and the volume of crude oil transferred has fluctuated over the last two decades; there was continuous trade between 2001 and 2011, with noticeable peaks in 2004 and 2009 when 2.6 million tonnes of crude oil was transferred.

Following a lack of trade between 2012 and 2014 there has been constant growth over the last few years: 2018 has seen a substantial number of transfers recorded since operations began involving the transfer of 4.8 million tonnes of oil.

Whilst future volumes and cargo types (crude, LNG, LPG) are difficult to predict there is clearly an increasing trend, suggesting that Scapa Flow will continue to be the preferred location in the UK for this kind of operation.



Source: Orkney Harbour Authority.

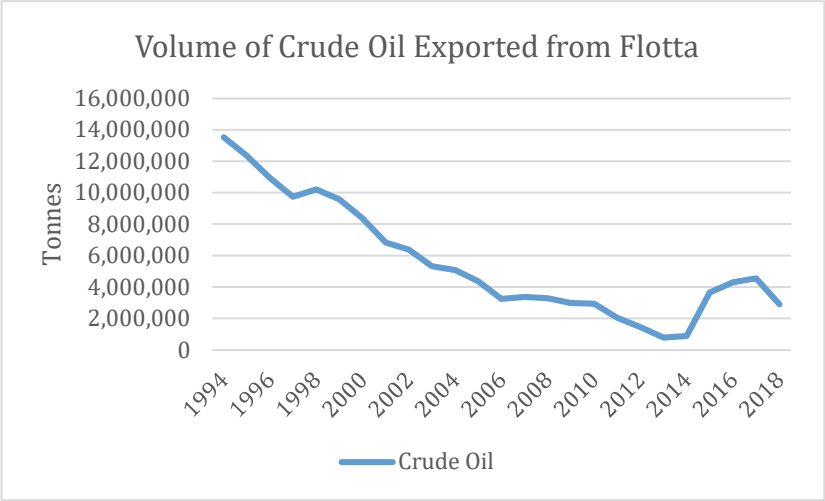
Flotta Terminal operations

Looking at historical trends, there has been a long-standing decline in the volume of crude oil exported from the Flotta Terminal up until 2013.

From then onwards there has been a marked increase in volumes, with a significant rise in 2015 followed by constant growth up until 2017, when 4.6m tonnes of crude oil was exported – figures for 2018 suggest a slight decline, with only 3.1m tonnes exported.

Despite the recent positive trend, growth is not expected over the coming years, as operations at the Flotta Terminal are envisaged to wind down and cease at some point during the next 20 years.

Diversification and extending the longevity of Flotta are therefore important aspirations.



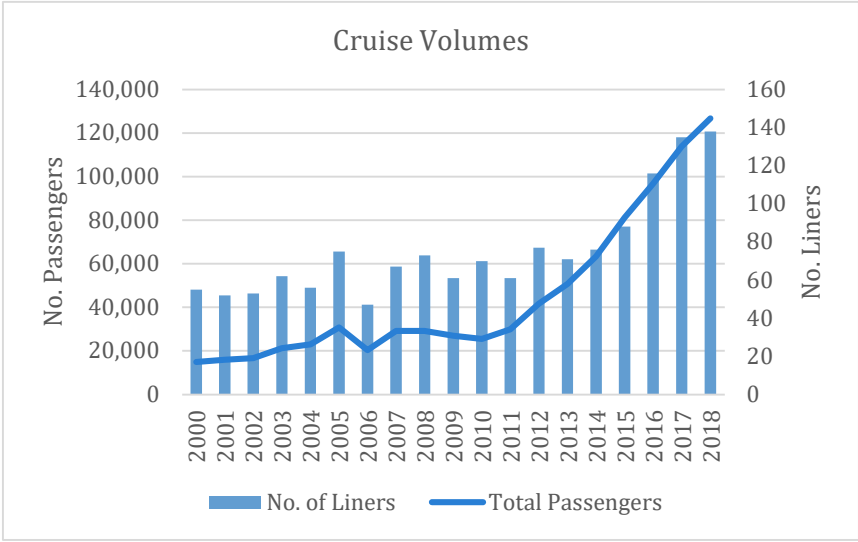
Source: Orkney Harbour Authority.

Cruise

Orkney's cruise market has grown considerably since 2010. This reflects strength of visitor product, marketing to cruise lines, the quality of marine and shoreside service and the extension of the Hatston berth in 2012.

There were 138 calls in 2018 compared to 70 calls in 2010, and just under 127,000 passengers – more than four times those in 2010. Most of the growth has been since 2014, with vessel calls rising from 76 to 138.

At the time of writing there were 175 vessel calls booked for 2019 which could bring up to 160,000 passengers.



Source: Orkney Harbour Authority.

Other harbour activities

- Orkney relies on lifeline passenger and freight ferry services with the Scottish mainland. In 2018 34,973 passengers and 5,060 cars travelled on the Aberdeen – Kirkwall Northlink ferry service, compared with 153,312 passengers and 43,222 cars on the Stromness – Scrabster route. A smaller number of passengers (18,770) and vehicles (3,136) travelled between Kirkwall and Lerwick also.
- Total ferry carryings to/from Orkney will be greater than this as they will include the Pentland Ferries vehicle service and the John O' Groats passenger service. The 2017 Orkney Visitor Survey shows an equal number of visitors use the Northlink and Pentland Ferries service across the Firth. Aberdeen is currently the dominant route for freight due largely to its connectivity south and access to the oil and gas supply chain and livestock markets.
- There is a fleet of inter-isle ferries connecting isles to the north and south with the Orkney Mainland. Around 338,900 passengers travelled on these services during 2018.
- Orkney is a hub for inshore fisheries. Commercial fishing for prawn, crab, lobster and scallop and the development of large scale salmon farms contributes a significant commercial value to the local economy in Orkney.
- There are three marinas in Orkney (Stromness, Kirkwall and Westray) which are operated by Orkney Marinas Ltd (a public interest charitable company). Orkney is an attractive destination for visiting boats, with 653 coming in 2018 and numbers increasing over the last few years.
- Orkney has been at the forefront of marine renewable energy research and development for the last decade driven by the European Marine Energy Centre (EMEC). There are many harbour facilities around Orkney which support wave and tidal energy development, particularly the handling and servicing of renewable energy devices and, most recently, the production and usage of hydrogen.
- Petroleum products for the county's transport and heating requirements are piped ashore from vessels berthed at Scapa Pier. Petrol, kerosene and diesel are stored in tanks built into the hillside to the east of the pier.

Renewable device handling at Hatston Pier

How Orkney Harbours are financed

The piers and harbours around Orkney (apart from Flotta oil jetty, single point moorings and St Margaret's Hope) are operated by OIC, the Statutory Harbour Authority. Marine Services is the entity within OIC that manages port operations – operating almost as a stand-alone business, in that Orkney Harbours competes with other commercial ports and harbours around Scotland across a range of key sectors; enhancements and improvements to harbour infrastructure are solely funded from revenue accrued from harbour dues. To this end Orkney Harbours has its own financial accounts and there are two:

Scapa Flow Oil Port Account: any surpluses (e.g. profit) arising from harbour dues and other fees associated with servicing Flotta Oil Terminal and STS are transferred to the Council's Strategic Reserve Fund – around £4m per annum over the last three years.

Miscellaneous Piers and Harbours Account: income from harbour dues and other fees associated with any other harbour business is spent on repairs, maintenance and improvements across the 29 piers and harbours around Orkney – this has been in the region of £6m per annum over the last three years. Any surpluses arising are transferred to a Miscellaneous Piers and Harbours Reserve Fund.

Compared with other ports in Scotland, Orkney has invested very little of its own surpluses in enhancing its core infrastructure over the last 15 years, in the region of just £12 million – less than the Harbour Authority's annual turnover.

Balance between commercial and community needs

Many stakeholders comment that there has for a long time been insufficient investment in the smaller piers around Orkney. Many of these piers, whilst important social assets for the communities that they serve, generate little or no revenue and have perhaps in the past been de-prioritised or excluded because of this; there is generally limited funding available to execute the optimal enhancements at each of Orkney's 29 piers and harbours.

At the same time the Flotta Oil Terminal, services for which provide a substantial part of the Harbour Authority's income, is nearing the end of its current life – and this may have implications for the future financial viability of the Harbour Authority and Council.

Thus the Harbour Authority must look to the future and invest in the facilities and infrastructure that will both safeguard and enable growth in existing markets and enable diversification into new markets and revenue streams – achieving this will create the financial capability to invest in and improve all of Orkney Island Council's harbours and piers.

Climate emergency and decarbonisation

In April 2019 the First Minister of Scotland declared a climate emergency. In May 2019 the Scottish Government stated that it is committed to achieving net-zero emissions by 2045, based on a report by the UK Committee on Climate Change. The Climate Change (Scotland) Bill has been amended to reflect this as well as raising the target levels for 2030 and 2040 to 70% and 90% emissions reductions respectively. In doing so Scotland will have some of the world's most ambitious targets in law and climate change will be at the core of future Programmes for Government and Spending Reviews.

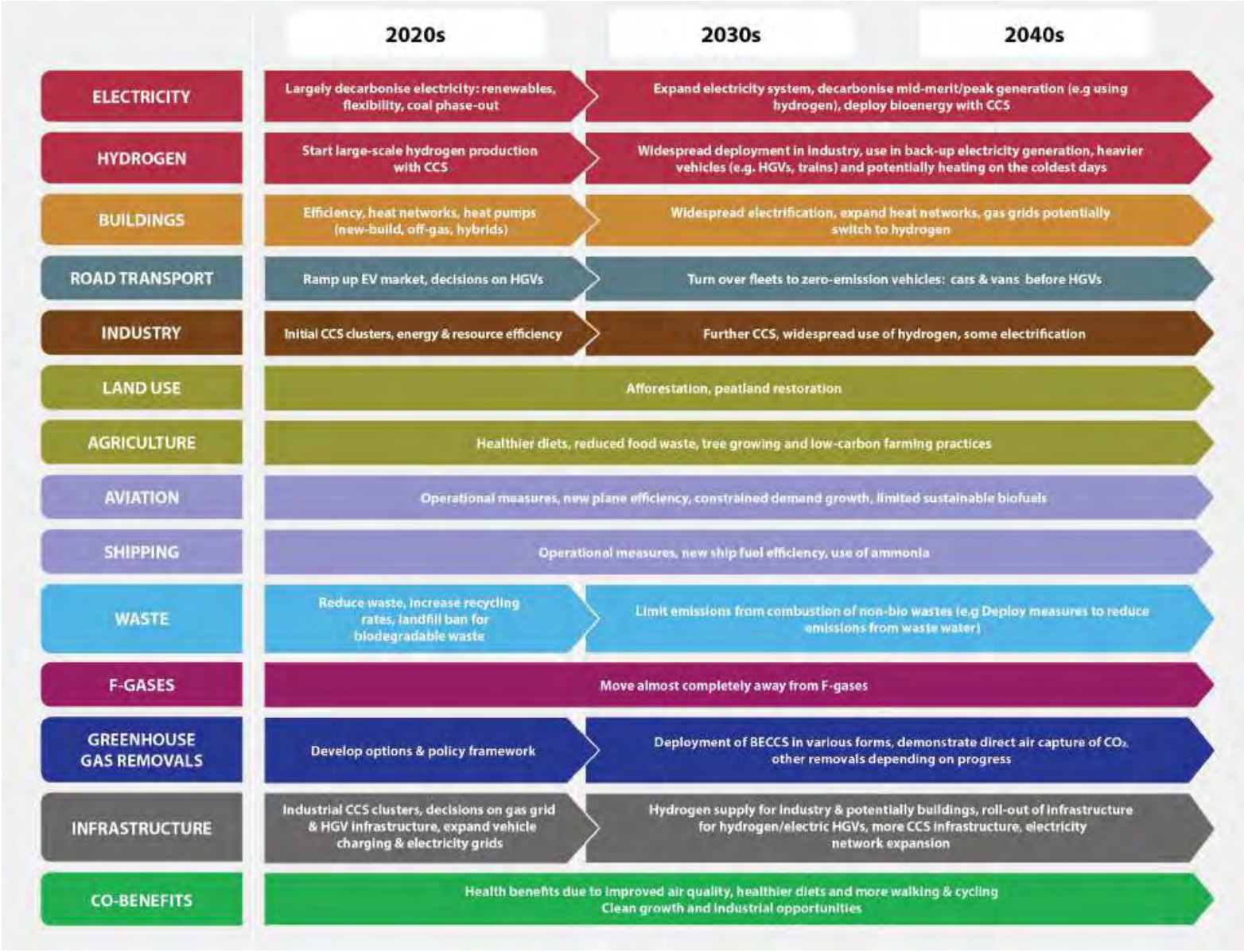
OIC has also declared a climate emergency with a declaration made at a Special General Meeting in May 2019. Thus Orkney is committed to reducing its carbon footprint, starting from a strong baseline of pioneering renewable energy development.

The masterplan proposals were already at a well-developed stage when the climate emergency was announced by Government and OIC. Nonetheless it is important to be cognisant of what is a very ambitious plan for decarbonisation in Scotland and to align masterplan proposals as far as possible with the emerging policy and legislation.

The diagram overleaf indicates the required action to achieve net-zero emissions by 2050 as proposed by the Committee on Climate Change in May 2019.

Orkney Harbour Authority is committed to making every effort towards realising net-zero emissions – hydrogen and locally produced electricity are already being used to power ferries in Orkney.

Proposed transition to net-zero emissions



Source: Committee on Climate Change, NetZero The UK's Contribution to stopping global warming (Figure 6.1).

Infrastructure and decarbonisation

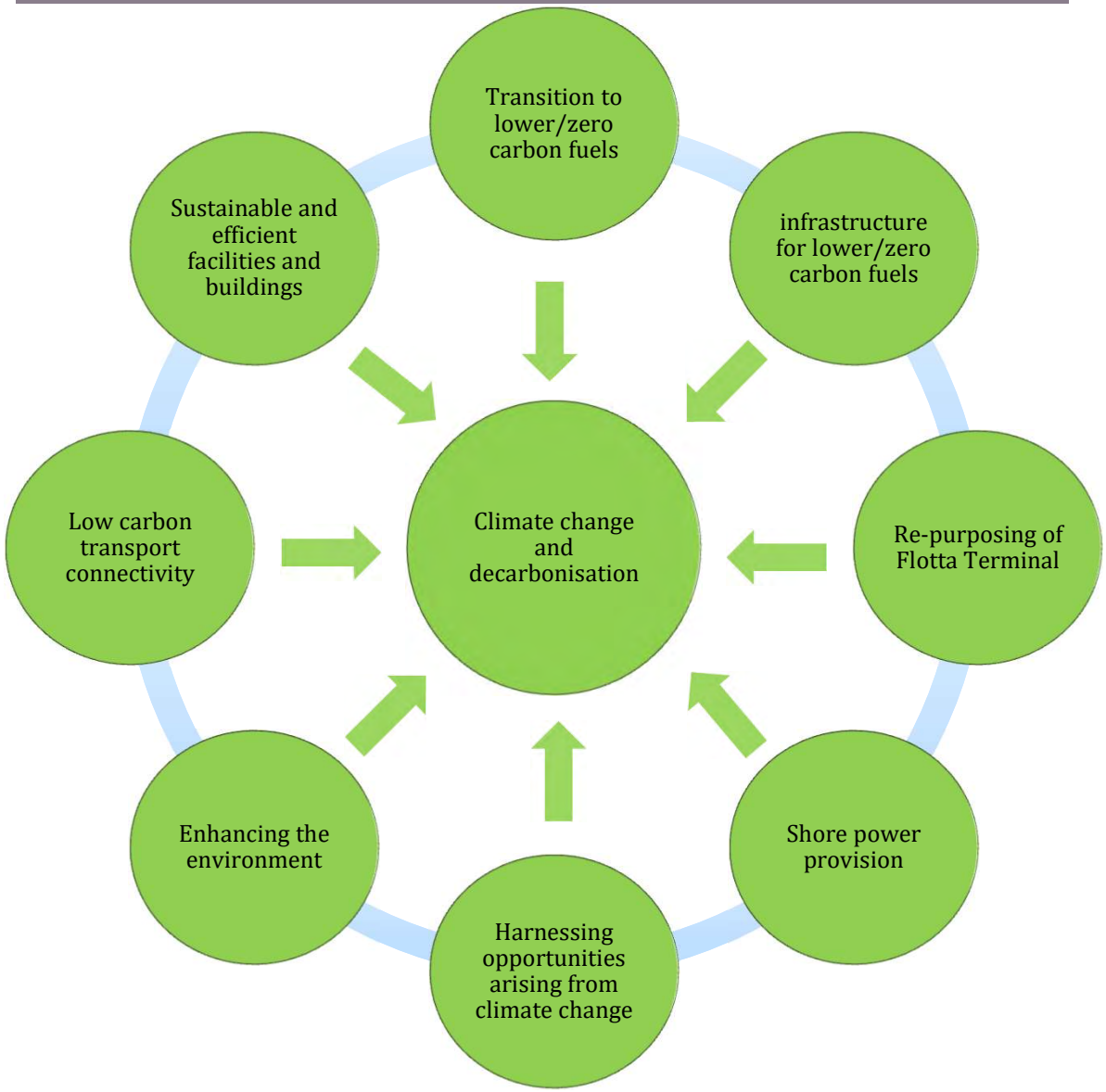
There are now many organisations and individuals who are of the view that there should be no investment to support activities in the oil and gas sector. We know and acknowledge that activity in this sector will diminish over time; however, at this point in time and for the foreseeable future, the efficient transport and delivery of oil and gas products continues to be essential to support the industrial sector and society in general. There is considerable opportunity for port operations, jobs and economic activity that will benefit businesses and residents living in Orkney. Indeed, Orkney's wealth as demonstrated by the Strategic Reserve Fund is predicated on the successful Scapa Oil Port business over the last 40 years.

Orkney Harbours must remain competitive with other ports if it is to enhance its revenue potential and part of this means targeting and attracting some business from the oil and gas sector, particularly given Orkney's proximity to the West of Shetland oil reserves.

Orkney Harbour Authority is nonetheless committed to supporting the transition from fossil fuels to lower carbon and eventually carbon-free alternatives – this is a strategic priority.

The aspects highlighted opposite will be embedded in the further development and refinement of all proposals.

Measures focussed on decarbonisation



Transition to less polluting fuels in shipping

Maritime transport emits around 940 million tonnes of CO_2 annually and is responsible for about 2.5% of global greenhouse gas emissions globally (International Maritime Organization (IMO) 3rd Greenhouse Gas Study). The IMO, through MARPOL (International Convention for the Prevention of Pollution from ships), is responsible for enforcing emission standards to limit the main air pollutants contained in ship exhaust gas, particularly sulphur oxides (SO_x) and nitrous oxides (NO_x).

MARPOL enabled the introduction of emission control areas (ECAs) to reduce emissions in designated sea areas – Orkney is located in one of these: the North Sea. Within the ECAs the limit for SO_x was reduced to 0.10% from January 2015. Outside ECAs the limit will be reduced from 3.5% to 0.5% effective from 1st January 2020.

A number of 'special areas' have been identified where a higher level of protection is defined. The North Sea is one and more stringent limits for NO_x will enter into force on 1st January 2021 in accordance with the IMOs Tier III control standards.

The UK Government has just published its 'Clean Maritime Plan', an action plan to take UK maritime sector towards the vision for zero emission shipping set out in Maritime 2050, its strategic vision for the future of the maritime sector in the UK.

By 2035:

- The UK has built a number of clean maritime clusters and low or zero emission marine fuel bunkering options are readily available across the UK.
- The UK is home to a world-leading zero emissions maritime sector.

Futureproofing infrastructure for low/zero carbon fuels

There is already a move towards LNG within the shipping industry, and there is now significant research and development into zero-emission technologies and fuels.

Orkney is at the forefront of this innovation, with the first hydrogen-powered ferry currently under development.

- There is an opportunity for Orkney to be a leading player in the development of clean maritime clusters and to inform the development of the Clean Maritime Plan.
- Whilst marine gas oil bunkering is incorporated into the masterplan proposals all infrastructures will be futureproofed so that alternative fuelling systems can be accommodated in the future, whether this is LNG, hydrogen, ammonia, methanol or biofuel.
- A pricing policy may be developed in the future to incentivise the use of lower carbon or zero carbon fuels and technologies.
- It is envisaged that OIC will develop an internal decarbonisation strategy which would include harbour operations.

Re-purposing of Flotta Terminal

As previously stated, diversification and extending the longevity of the Flotta Terminal are important aspirations. Whilst the re-purposing of Flotta Terminal is not a masterplan proposal (on account of harbour infrastructure on Flotta not being within the ownership of Orkney Islands Council), it is of significant importance.

The COMAH site at the Flotta Oil Terminal could be repurposed towards lower carbon energy use so as to avoid the closure, decay and loss of employment of a world class facility, which would happen if the facility was to remain an oil terminal. This collective repurposing initiative is a significant and innovative alternative to decommissioning and a very different way of managing the transition from oil to a lower carbon future.

Shore power

Shore-side power comprises powering a vessel's auxiliary systems at the berth and can significantly reduce emissions.

The provision of shore-side power to the MV Hamnavoe (ferry vessel) in Stromness is planned to be available from early 2020, with the power coming through Orkney's renewable energy resources. This power supply system, known as 'cold ironing', will cut the current overnight carbon footprint from the vessel's diesel generators and engines, lowering fuel consumption by at least 500 tonnes a year and resulting in a significant reduction in carbon dioxide (CO2). It will also make a contribution towards further reducing nitrogen oxides (NOx), sulphur oxides (SOx) and noise. This will also reduce operating costs for the ferry operator.

Shore-side power is already provided to vessels operated by Marine Services (e.g. tugs, pilot boats, inter-isle ferries). Whilst not available at all port facilities, the vision is to identify where this could be provided and to offer the facility to more vessels in the future. Any new infrastructure would be futureproofed to accommodate the provision of shore-power where possible.

Harnessing opportunities from climate change

Scapa Flow is already identified as a strategic asset for the UK, being Europe's largest natural harbour with very deep water anchorages. This location will become an increasingly valuable strategic asset as shipping traffic volumes between the Far East/Russia and Europe and North America through the arctic waters increase due to the impact of global warming on polar sea ice coverage.

This is aligned with Scotland's focus on developing stronger links with communities in the Arctic region; an Arctic Strategy is being prepared which considers climate change, the geopolitical relationship between Scotland and the region, academic and research collaboration, economic opportunities and community links.

The UK Government reported in research (Future of the Sea: Implications from Opening Arctic Sea Routes, 2017) that there are specific opportunities for the UK as and when the arctic shipping routes open up: namely cruise tourism, trans-shipment port infrastructure and services and the supply of specialist marine services.

For Orkney and in the marine space there could be significant opportunity to develop new trade links and provide infrastructure and services to capitalise on increasing shipping traffic in the region. This further strengthens the current and future role of Scapa Flow as a strategic asset for Scotland and the UK.

Enhancing the environment

Many of the masterplan proposals have potential to have a positive impact on the local environment, townscape and visual amenity, through sensitive design, improvements to layouts, traffic flows and removing conflict between different operational activities.

There will be other opportunities to enhance the environment, particularly through the creation of green infrastructure; this might include landscaped features positioned to aid vehicular or pedestrian traffic management; or planting to make particular spaces more attractive.

Following construction there will be opportunities for landscaping, re-vegetation and habitat enhancement which would be undertaken in line with appropriate guidance to maximise benefit for biodiversity.

Futureproofing infrastructure, buildings and facilities

Any new infrastructures, buildings or facilities will be designed to incorporate sustainable and efficient systems, utilising renewable energy where possible.

This may tie in with outcomes from the ReFLEX project which concerns the storage of electricity when output of renewable energy systems are highest and utilising this efficiently.

SEPA report that the expected sea level rise for the Orkney Islands is 0.93m by 2100 based on the latest UK climate change predictions reported in 2018. SEPA recommend that this allowance is taken into consideration to ensure that any new developments are sustainable – this is common practice when developing new marine infrastructures.

With such a rise in sea level predicted there could be significant threat to existing settlements around Orkney and this in turn could impact on existing marine services and infrastructures. It is not possible to say at this time what measures could be implemented; future iterations of the masterplan will take cognisance of potential eventualities and give consideration to potential mitigation measures.

Consideration will be given to best practice examples elsewhere, drawing upon the work being undertaken by organisations such as the United Kingdom Marine Climate Change Impacts Partnership (MCCIP) which brings together scientists, government, its agencies and NGOs to provide co-ordinated advice on climate change impacts and adaptation around the coast and seas.

Low carbon transport connectivity

Transport connections to and from quayside infrastructure and accessibility are important factors.

The Stromness Multi-Modal Low Carbon Transport and Active Travel Hub comprises key components that will be considered at feasibility stage for other infrastructure proposals, particularly where people need to be transported.

- Installation of electric vehicle charging points at Kirkwall and Hatston Piers for ferry users and other Electric Vehicle (EV) owners.
- Provision of electric bicycles at ferry and cruise terminals.
- Pool of electric vehicles available for residents and visitors at ferry terminals.
- Linking harbour facilities to existing and future walking and cycling networks to encourage active travel.

Planning status

It is proposed that the final Orkney Harbours Masterplan (Phase 1) be adopted as Planning Policy Advice providing status for the masterplan, including the masterplan proposals and Proposed Development Policy Principles (see opposite) in planning decisions.

The masterplan proposals are indicative and will be subject to change and iteration as they progress through business case appraisal, feasibility, design and further environment assessment. The aspirations of the masterplan will be taken forward in accordance with adopted planning policy with due regard to known constraints.

As an adopted Council strategy and Planning Policy Advice, the masterplan will inform the future development of policies and plans, particularly the Orkney Local Development Plan, the Orkney Aquaculture Supplementary Guidance and the Orkney Islands Regional Marine Plan – all of these will also be subject to formal public consultation.

Appendix A provides legal context to the definition of harbour areas, port premises and permitted development, with an overview of land owned and operated by the Orkney Harbour Authority.

Proposed Development Planning Policy Principles

As part of the masterplanning process a number of policy principles to safeguard harbour operations in Scapa Flow have been developed. The Proposed Development Policy Principles are particularly relevant to planning authority responsibilities for consenting aquaculture and guiding aquaculture development proposals.

It is paramount, both from a Harbour Authority point of view and from a wider community perspective that existing and future harbour operations in Scapa Flow are safeguarded as far as possible in terms of safe navigation, manoeuvring, anchorages and provision of necessary harbour infrastructure.

Scapa Flow is an important EU location for STS operations for the transfer of crude fuel oils and LNG. At present there are 15 designated anchor berths in Scapa Flow including four STS berths. There has been significant growth in the volume of STS coupled with new operations involving the supply and maintenance of oil platforms at anchor.

Looking to the future there is significant potential for growth, encapsulated in the masterplan proposals for Scapa Flow.

Whilst this masterplan only covers the period up to 2040 there may be well be longer term requirements for more harbour infrastructure around Scapa Flow. At the same time, Flotta may offer a unique industrial opportunity in the longer term, with its current facilities transforming to meet future market needs.

It should be noted that these Policy Principles are not intended to affect existing operations, such as aquaculture sites already consented in Scapa Flow; they will however apply to any new developments or extensions to existing sites.

Three Development Policy Principles are presented in Appendix B.

Issues and constraints

Actual and perceived issues and constraints underpin the development of outline requirements and masterplan proposals. Issues and constraints have been identified through the following means:

- Consultant review and analysis of data relating to current harbour operations and activities.
- Internal discussions with the Harbour Authority.
- Workshops and discussions with harbour users and other stakeholders.

Some harbours are struggling to efficiently accommodate multiple users and activities; such conflicts impede efficiency and economic activity

- At Hatston there can at times be insufficient quay length and quayside space to efficiently accommodate operational activity. This is particularly the case when cruise liners are alongside during the summer months – whilst cruise is a key component of Orkney Harbour's business base it is also a barrier to other sectoral activity and growth.
- At Kirkwall there are many different types of vessel competing for berthing/landing space, plus there is limited space on the quayside for operational activity and transportation.
- The marina at Kirkwall cannot meet demand for resident berths or larger visiting yachts; there is also some demand from commercial boat owners for pontoon berths.
- Efficient servicing of ships and platforms at anchor is constrained by lack of berthing space, laydown area and water depth at Scapa Pier. This also renders the pier unsuitable for aquaculture support.

There is a lack of appropriate infrastructure and facilities to accommodate existing and future operational activity

- According to recent analysis there are opportunities for Orkney in oil and gas which are only achievable with the right infrastructure in place – e.g. very deep water to attract rigs and platforms alongside.
- Orkney cannot become a successful oil and gas supply base without adequate harbour infrastructure in terms of water depth, available berthing space all year round, lay down/storage and other essential services and supplies.
- There are other growth sectors which will require support facilities and harbour infrastructure in the medium to long term – particularly fisheries, aquaculture and renewables. There may also be a potential opportunity with regard to the development of boat repair, lift out and maintenance facilities in the future.

Ability of harbour infrastructure to ensure future resilience of Orkney's fuel supply

- It is possible that the next generation of tankers which deliver Orkney's fuel supply will have a Length Overall (LOA) that cannot be accommodated at Scapa Pier. The only fuel tanks/offload facilities in Orkney are located at/in close proximity to Scapa Pier and are not likely to be at the end of their usable life for a considerable time.

Issues and constraints

The nature of some infrastructures is such that they are inflexible in what kind of activity or vessels they can accommodate

- Smaller boats struggle to utilise some of the main piers such as Copland's Dock and Kirkwall Pier – this is because the quayside is either high or there are insufficient bollards or fenders that are suitable for small boats.

Layout, buildings and traffic management in operational harbours areas can be inefficient, which raises safety issues

- At Kirkwall the condition and use of all buildings requires review and assessment – some may be in the wrong location; others are not fully or efficiently utilised. The waiting room for the inter-isle ferry service, for example, is too far from the linkspan.
- Traffic management and marshalling is constrained at Kirkwall due to lack of space.
- There is uncontrolled parking at many piers including Stromness and Kirkwall.
- There are many areas where there are conflicts between pedestrian and vehicle movements/operations – at Hatston and Kirkwall.
- Overall there is poor visual amenity, poor accessibility and poor information for visitors travelling on ferries at Kirkwall.

Opportunities

A market assessment was undertaken, which considered the opportunities in existing and potential markets. This was based on a review of relevant sectors in terms of:

- Current situation.
- Market drivers.
- Opportunities.

A summary of findings is presented overleaf, followed by an indication of masterplan priorities.

With regard to opportunities in the oil and gas sector, EY (formally Ernst & Young) undertook a separate market assessment – these findings are also incorporated overleaf.

Opportunities (continued)

Market	Key findings and opportunities
Oil and gas – supply base	• Orkney is ideally located to service oil and gas vessels supporting activities West of Shetland in particular. • **Orkney cannot attract this market at present as does not have sufficient infrastructure, guaranteed berth availability and services.**
Oil and gas STS/ crude transport	• Scapa Flow is already a preferred location for STS. **Improvements to Scapa Pier will improve the service offering and attractiveness of this location**.
Oil and gas – rigs at anchor	• Scapa Flow is already an ideal location for setting drilling and accommodation rigs at anchor during temporary downtimes in particular. **Improvements to Scapa Pier will make this activity more efficient**.
Oil and gas – rigs alongside	• Rig operators are looking for alternative sites to carry out large scale maintenance and modification programmes. • **Opportunity for Orkney to target this market through creating a new deep water facility in Scapa Flow.**
Oil and gas – decommissioning	• EY concluded that other ports are better placed for large-scale decommissioning work in the Central and Northern North Sea – and will generally be in closer proximity. • Decommissioning of West of Shetland installations will not come on stream in the short term, rather post 2045: thus **the main opportunity for Orkney will be longer term and related to West of Shetland assets.**
LNG storage and bunkering	• Orkney has the potential to act as a LNG bunkering hub or storage facility, which could be recognised as a National Strategic Asset. • **There are proposals underway to build a blueprint for such infrastructure.**
Renewables	• Renewables industry in Orkney continues to develop, particularly in the testing of new technologies in **wave and tidal energies**. Whilst there are some barriers to growth in this particular area (e.g. grid connection), there is potential for growth which will then rely on the adequacy of **harbour infrastructure for deployment, testing and maintenance of devices**. • There will be opportunities for Orkney to harness activity from the construction and operation of **offshore wind farms** as and when they come on stream. There are several identified sites in close proximity to Orkney, which will be leased in 2019, with a projected construction date of 2027. There will be specific requirements relating to harbour infrastructure, particularly in terms of **sufficient water depth and laydown area**. • There is also an opportunity to support renewable energy technological developments through **identifying suitable locations for specific activities (e.g. production/storage of hydrogen, LNG, synthetic fuels, etc.).**

Opportunities (continued)

Market	Key findings
Cruise	• Underlying demand is increasing across all vessel sizes – the challenge will be accommodating this growing demand through enhancing port infrastructure and developing the wider visitor experience whilst lessening the potential negative impacts locally. • **More opportunity to come alongside at Kirkwall will be attractive to cruise lines – additional infrastructure will reduce conflict between cruise and other operations and lower carbon fuelling opportunities could become an opportunity.**
Ferries	• **Significant uncertainty regarding external and internal ferry services in terms of vessels and service configuration**. • Finalisation of the next Northern Isles ferry services contract (for ferry services between Scotland and mainland Orkney) could result in different infrastructure requirements (e.g. different timetables, service provision, etc.). At the time of writing this contract was due to be awarded in early 2020. • Should the Road Equivalent Tariff (RET) be implemented there could be a significant impact in terms of traffic carried. • Work is ongoing to determine how the future inter-isle ferry fleet will look in terms of type of vessel, number of vessels and configuration of services. • **There may be impacts on harbour infrastructure requirements at multiple locations.**
Aquaculture	• The industry is well developed in Orkney and plays a key role in the economy. • Strong growth is expected in salmon farming with new sites currently being developed. • In the medium to longer term there may be a requirement for **new processing/harvesting facilities**. • At an operational level companies report **issues with significant lack of berth space and provision of facilities.**
Fisheries	• Orkney has a strong and diverse inshore fisheries and seafood processing sector. • Opportunity to improve efficiency of these sectors through **provision of better facilities for fishing and processing**. • The impact of the UK leaving the EU is unclear, but it could be beneficial with the **potential for local control over stocks.**
Marine leisure	• **Demand for resident berths and for larger visiting yachts** in particular – at key locations such as Kirkwall/Stromness. • There is also demand from commercial operators (e.g. dive boats, other tour boats and creel boats) for pontoon berths. • Number of marine tours around Orkney is growing; at present there is no dedicated berth for such tours: **better pier facilities would enhance the attractiveness of this tourism product.**
Boat repair/ maintenance facility	• There is potentially an opportunity to **develop a boatyard repair, lift out and maintenance facility in Orkney** – this view came across strongly during stakeholder discussions. Such a facility could cater for marine leisure craft, fishing, aquaculture boats and other work boats operating around Orkney, potentially even small ferries and oil supply boats in the future.

Priorities for the masterplan

Short (0 – 5 years)	Medium (5 – 10 years)	Long (10+ years)
• **Oil and gas**: build infrastructure so that Orkney becomes a thriving and attractive oil and gas supply base for West of Shetland assets.	• **Internal ferries:** create dedicated lay-by area in Kirkwall and reconfigure marshalling area and buildings.	• **Renewables**: ensure appropriate infrastructure is there to handle and maintain renewable energy devices in the future (tidal/wave).
• **Oil and gas**: optimise efficient operation of anchorages and STS operations through enhancing Scapa Pier.	• **Fisheries:** enhance harbour infrastructure to support fisheries – e.g. expansion of Tingwall or new dedicated fishing port (to be investigated in Phase 2).	• **Oil and gas**: potential decommissioning associated with West of Shetland assets.
• **Fuel supply**: futureproof Orkney's fuel supply delivery for the long-term by enhancing Scapa Pier.	• **Boat repair and maintenance facility**: earmark area for construction of shiplift and undercover facility.	
• **Transition to zero-carbon society**: future proof harbour infrastructure design as transition progresses.	• **Transition to zero-carbon society**: Scapa Deep Water Quay is a suitable location for LNG storage/hub facility.	
• **Aquaculture**: earmark shoreside area for development of new facilities to support this growth sector (e.g. processing/harvesting plant).	• **Cruise**: more smaller cruise liners will come alongside at Kirkwall Pier and at anchor in Stromness, reducing conflict between cruise/other activities.	
• **Fisheries**: improve and increase facilities for fishing boats in Orkney.	• **Marine leisure:** reconfiguration and expansion of Kirkwall and Stromness marinas.	
• **External ferries and freight:** improve freight handling and logistics.	• **Oil and gas**: create very deep water quayside to handle structures and large vessels alongside.	
• **Marine leisure**: create dedicated marine tourism berth at Scapa Pier.	• **Offshore wind**: create harbour infrastructure with sufficient depth of water and laydown area to support construction and operations and maintenance (O&M).	

Key drivers and business needs

Based on the issues and constraints and market assessment there are several factors which make up the case for change:

Key driver 1: if and when operational activity at the Flotta Oil Terminal ceases, there will be a significant drop in harbour income

- One key driver for change is **financial** and is centred around the uncertainty over future income generated through Orkney Harbours, particularly if and when operational activity at the Flotta Oil Terminal ceases.
- If there is no investment in infrastructure/services in the short term, it will be difficult not only to maintain current income levels but also to generate new income from growth in existing markets or from new markets. This in turn will impact on the ability to maintain and invest in any harbour infrastructure around Orkney, including the many small piers and harbours that do not generate substantial revenue.

Key driver 2: lack of appropriate infrastructure is constraining operational and economic activity

- Another key driver is **efficiency**, in terms of how infrastructure is used, conflicts between users, availability of infrastructure and layout and available land area for development and/or operational activity. In terms of **economic development** there are opportunities at Kirkwall to create economic activity and deliver community benefit through a waterfront development and marina expansion in particular.

Key driver 3: without investment in harbour infrastructure Orkney will not attract substantial new business from across a number of key sectors

- Orkney has the potential to develop a successful oil and gas supply base, to support the West of Shetland assets coming on stream. It cannot do this at present with its current infrastructure and service provision.
- Hatston is the preferred location given its proximity to the West of Shetland, alongside the potential area available for laydown and operations and proximity to the supply chain.
- The construction of new quayside infrastructure here would provide the oil and gas sector with unconstrained berthing, as well as an ex-pipe fuelling system, sufficient depth of water and, potentially lower carbon fuel solutions in due course.
- Without investment in new infrastructure this opportunity will be missed, with supply boats operating out of other Scottish ports.
- There is a much larger opportunity, should Orkney decide to deliver a deep water port in Scapa Flow capable of handling structures and vessels alongside. Such investment could give Orkney a real competitive edge in oil and gas and offshore wind.

Key driver 4: futureproofing Orkney's supply of fuel

- It is regarded as paramount that the delivery of Orkney's entire fuel supply is secured for the long term. As the current fuel tanks are not at the end of their life, the only solution for this is to ensure that Scapa Pier can continue to accommodate the tankers that deliver fuels now and in the future.

Importance of policy context

This masterplan has been developed in cognisance of key national, regional and local policies and plans (see opposite). A detailed summary of these is presented in Appendix C.

The level of fit with policy aims and objectives at all levels is pertinent in that this can influence the availability of funding and deliverability.

Subsequent tables show how masterplan proposals fit with some of the key policies.

Key policies and plans

National	• Scotland's Economic Strategy • National Planning Framework 3 (4) • Infrastructure Investment Plan • National Transport Strategy • Scotland's National Marine Plan • Scottish Government Ferries Plan • Marine Tourism Strategy • National Islands Plan • Scottish Climate Change Adaptation Programme • Climate Change (Scotland) Bill 2009 amendments
Regional	• HIE Operating Plan • HITRANS Regional Transport Strategy • Pentland Firth and Orkney Waters Spatial Plan
Local	• Orkney Council Plan 2018 – 2023 • Orkney Community Plan 2017 – 2020 • Orkney Local Development Plan 2017 • Orkney Islands Regional Marine Plan • Kirkwall Urban Design Framework • Orkney Tourism Strategy 2019 – 2025 • Orkney Sustainable Energy Strategy • Orkney Hydrogen Strategy

Fit with Scotland's Economic Strategy

	Investment In people and infrastructure in a sustainable way	Innovation Foster culture of innovation and R&D	Inclusive growth Create opps through fair & inclusive jobs market/regional cohesion	Internationalism Promote Scotland on international stage to boost trade/investment, etc
Kirkwall				
New multi-use quays and berths	✓	✓	✓	✓
Marina expansion and waterfront development	✓	✓	✓	✓
Hatston				
Multi-use quays/berths for oil and gas, etc	✓	✓	✓	✓
Land and facilities available for development	✓	✓	✓	✓
Better management of traffic and access routes	✓			
New ferry/cruise passenger reception facility	✓			✓
New aquaculture processing/harvesting facility	✓		✓	✓
Stromness				
Copland's Dock quay and land improvements	✓			
Marina expansion and cruise tender pontoon	✓		✓	✓
Scapa Pier				
Longer quay, deeper water	✓	✓	✓	
Marine leisure pontoons	✓	✓	✓	
Scapa Deep Water Quay				
Deep water quay and laydown area	✓	✓	✓	✓
Lyness				
Hard standing terminal area	✓	✓	✓	✓

Fit with Scotland's National Marine Plan and Marine Tourism Strategy

	National Marine Plan		Marine Tourism Strategy
	Achieve a sustainable marine economy	Strong, healthy and just society	Marine Tourism Destination of Choice
Kirkwall			
New multi-use quays and berths	✓	✓	✓
Marina expansion and waterfront development	✓	✓	✓
Hatston			
Multi-use quays/berths for oil and gas, etc	✓	✓	✓
Land and facilities available for development	✓	✓	✓
Better management of traffic and access routes	✓	✓	✓
New ferry/cruise passenger reception facility	✓	✓	✓
New aquaculture processing/harvesting facility	✓	✓	
Stromness			
Copland's Dock quay and land improvements	✓	✓	
Marina expansion and cruise tender pontoon	✓	✓	✓
Scapa Pier			
Longer quay, deeper water	✓	✓	
Marine leisure pontoons	✓	✓	✓
Scapa Deep Water Quay			
Deep water quay and laydown area	✓	✓	
Lyness			
Hard standing terminal area	✓	✓	

Fit with HIE's Operating Plan

	Accelerating Business Growth: investment, innovation and internationalisation	Strengthening Communities: growth in social enterprise and place-based development	Supporting Growth Sectors: sectoral development & regional opportunities	Developing Regional Attractiveness: making H&I a globally attractive region
Kirkwall				
New multi-use quays and berths	✓	✓	✓	✓
Marina expansion and waterfront development	✓	✓	✓	✓
Hatston				
Multi-use quays/berths for oil and gas, etc	✓	✓	✓	✓
Land and facilities available for development	✓	✓	✓	✓
Better management of traffic and access routes		✓		✓
New ferry/cruise passenger reception facility	✓	✓		✓
New aquaculture processing/harvesting facility	✓	✓	✓	✓
Stromness				
Copland's Dock quay and land improvements	✓	✓	✓	✓
Marina expansion and cruise tender pontoon	✓	✓	✓	✓
Scapa Pier				
Longer quay, deeper water	✓	✓		✓
Marine leisure pontoons	✓	✓	✓	✓
Scapa Deep Water Quay				
Deep water quay and laydown area	✓	✓	✓	✓
Lyness				
Hard standing terminal area	✓	✓	✓	✓

Fit with Orkney's Council Plan

	Invest in marine infrastructure & business development	Continue to develop strategic projects, to capitalise on renewable sector	Progress Islands Deal to deliver innovative, enterprising & transformational projects	Continue to encourage & support economic opportunities which maximise islands' opportunity & influence
Kirkwall				
New multi-use quays and berths	✓		✓	✓
Marina expansion and waterfront development	✓		✓	✓
Hatston				
Multi-use quays/berths for oil and gas, etc	✓	✓	✓	✓
Land and facilities available for development	✓	✓	✓	✓
Better management of traffic and access routes				✓
New ferry/cruise passenger reception facility	✓			✓
New aquaculture processing/harvesting facility	✓		✓	✓
Stromness				
Copland's Dock quay and land improvements	✓			✓
Marina expansion and cruise tender pontoon	✓		✓	✓
Scapa Pier				
Longer quay, deeper water	✓		✓	✓
Marine leisure pontoons	✓		✓	✓
Scapa Deep Water Quay				
Deep water quay and laydown area	✓	✓	✓	✓
Lyness				
Hard standing terminal area	✓			✓

Outline requirements

A series of outline requirements have been defined, which represent what the masterplan should deliver against (see overleaf).

Delivering these outline requirements will enable the masterplan objectives to be achieved (opposite).

Masterplan objectives

Commercial

- To establish a strategic framework and vision that will guide future infrastructure investment decisions towards a coordinated and sustainable future.

Financial

- To safeguard and enhance the financial sustainability of the harbour business within the context of a competitive business environment.

Socio-economic

- To support and enhance the socio-economic prosperity and social well-being of local communities.

Environment

- To safeguard and support the long-term productivity of the coastal and marine environment through best practice and strong environmental stewardship.

Outline requirements

- A. Address wave climate and weather issues where relevant
- B. Enable Orkney to become a preferred supply base location for offshore oil and gas
- C. Enable Orkney to attract more rigs/platforms for repair, supplies and crew changes
- D. Improve usability of pier infrastructure for smaller boats
- E. Provide necessary infrastructure to enhance resilience of Orkney's fuel supply now and potential diversification in the future
- F. Provide necessary infrastructure to safeguard and attract renewable energy activity and technologies
- G. Enable sustainable growth in cruise
- H. Enhance marine leisure and tourism in Orkney
- I. Facilitate potential growth in fishing
- J. Encourage new developments in boat repair sector
- K. Safeguard and grow aquaculture activity and supply chain development in a manner that is compatible with harbour operations
- L. Facilitate growth in freight traffic and increase efficiency of freight handling
- M. Remove conflicts between pedestrians and operational activity
- N. Improve safety for all harbour users
- O. Improve local character and visual amenity for residents/visitors
- P. Improve integration with transport networks
- Q. Address accessibility issues
- R. Meet future requirements of external and internal ferry services and their users

3. MASTERPLAN PROPOSALS

Masterplan proposals

The Orkney Harbours Masterplan Phase 1 comprises proposals at six harbour locations – see right / overleaf.

The selection of these follows an assessment of proposals against the outline requirements and objectives.

This section covers the following aspects:

- A description of proposals, accompanied by a plan.
- A high level cost estimate for each proposal, where possible.

Kirkwall Pier

- New multi-purpose quayside infrastructure.
- Waterfront development and marina expansion.
- Improvements to quayside area and traffic management.
- Improvements to fish landing areas.

Hatston

- New multi-purpose deep water quayside infrastructure.
- Reclamation and land available for development
- Reconfiguration of marshalling areas, parking and access.
- New passenger reception facility.

Scapa Pier

- Pier extension and deepening.
- Additional shoreside area and marine leisure berths.

Stromness & Copland's Dock

- Improvements to Copland's Dock quay.
- Reclamation to create additional quayside area.
- Marina expansion and cruise tender pontoon.
- Improvements to shoreside area and traffic management.

Scapa Deep Water Quay

- New deep water quayside infrastructure.
- 5+ hectares of laydown area.

Lyness

- Extension of hard standing yard/storage areas.

Hatston Pier

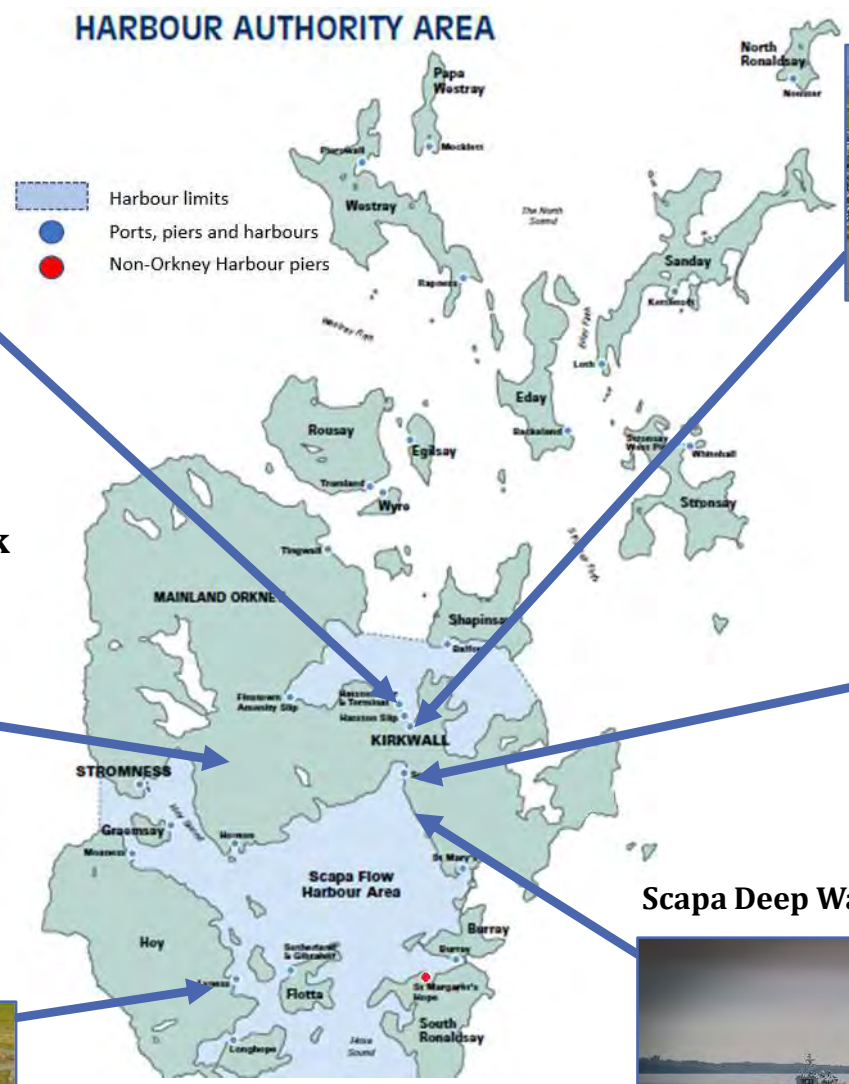
Kirkwall Pier

Stromness & Copland's Dock

Scapa Pier

Lyness

Scapa Deep Water Quay



Kirkwall Pier

Kirkwall Pier sits within the heart of Orkney's largest settlement, offering a picturesque waterfront looking out to sea and accommodating a diverse range of users and activities.

It is the hub for inter-isle ferry routes to the Outer North Isles and Shapinsay and home to the largest marina in Orkney; it is a key port for the inshore fishing fleet, the aquaculture sector and the marine supply chain in general, with many commercial boats operating out of Kirkwall.

Smaller cruise liners sit alongside at Kirkwall whilst larger ones tender in passengers to a pontoon in the Basin; the pier is frequently used for small boat repair on the quayside.

The plan for Kirkwall Pier is focussed on improving usability and efficiency of berths and quayside infrastructure, improving visual amenity, improving safety and better management of traffic and pedestrian movements.

Core proposals comprise new quayside infrastructure, a waterfront development area and marina expansion, as well as improvements to traffic management and facilities on the quayside.

With regard to developing marine tourism the initial focus is on Kirkwall and Stromness, given that these are the primary marinas in Orkney and are both operating at capacity – all yachts and leisure craft visiting Orkney visit one or other of these marinas during their trip. It is accepted that a wider strategy is required encompassing the whole of Orkney to create a network of yacht moorings, landing places and pontoons, as well as developing the services to support what is a growing sector. This strategy will be developed during Phase 2 and will build on what is proposed in Phase 1.

New multi-purpose quayside infrastructure

Aligns with the following outline requirements:

- Meet future requirements of external and internal ferry services and their users
- Improve usability of pier infrastructure for smaller boats
- Enhance marine leisure and tourism in Orkney
- Enhance sustainable growth in cruise
- Facilitate potential growth in fishing

200m of new multi-purpose quayside will be constructed to the north of the existing pier, with water depth of -6.5m Chart Datum (CD). The main purpose is to create lay-by berths for the inter-isle ferry fleet; it could also be utilised for fishing, cargo or slightly larger cruise ships than can currently be accommodated at this location (e.g. up to 130m LOA).

Waterfront development and marina expansion

Aligns with the following outline requirements:

- Enhance marine leisure and tourism in Orkney
- Improve local character and visual amenity for residents/visitors

A waterfront development area (circa 2.75 hectares) will be created through reclamation shoreside of the marina, for a range of uses/facilities: this could be marina facilities, marine leisure club facilities, boat storage, repair/chandlery provision, tourist/travel information, seating, retail, café or parking. The marina can be doubled in size, with 95 additional berths. Some could be dedicated for residents, visiting yachts (and particular sizes thereof) or commercial boats.

Improvements to quayside area and traffic management

Aligns with the following outline requirements:
- Remove conflicts between pedestrians and operational activity
- Improve safety for all harbour users
- Improve local character and visual amenity for residents/visitors

The entire layout of Kirkwall Pier, in terms of buildings, facilities and traffic management will be reviewed and remodelled. It is anticipated that some buildings will be demolished or moved, or that there may be new buildings or facilities constructed. The marshalling and parking areas, and designated routes for vehicles and pedestrians will be reviewed and re-designed, cognisant of changes in harbour infrastructure and potential new configuration of ferry vessels and services. This should also include a strategy for improved signage.

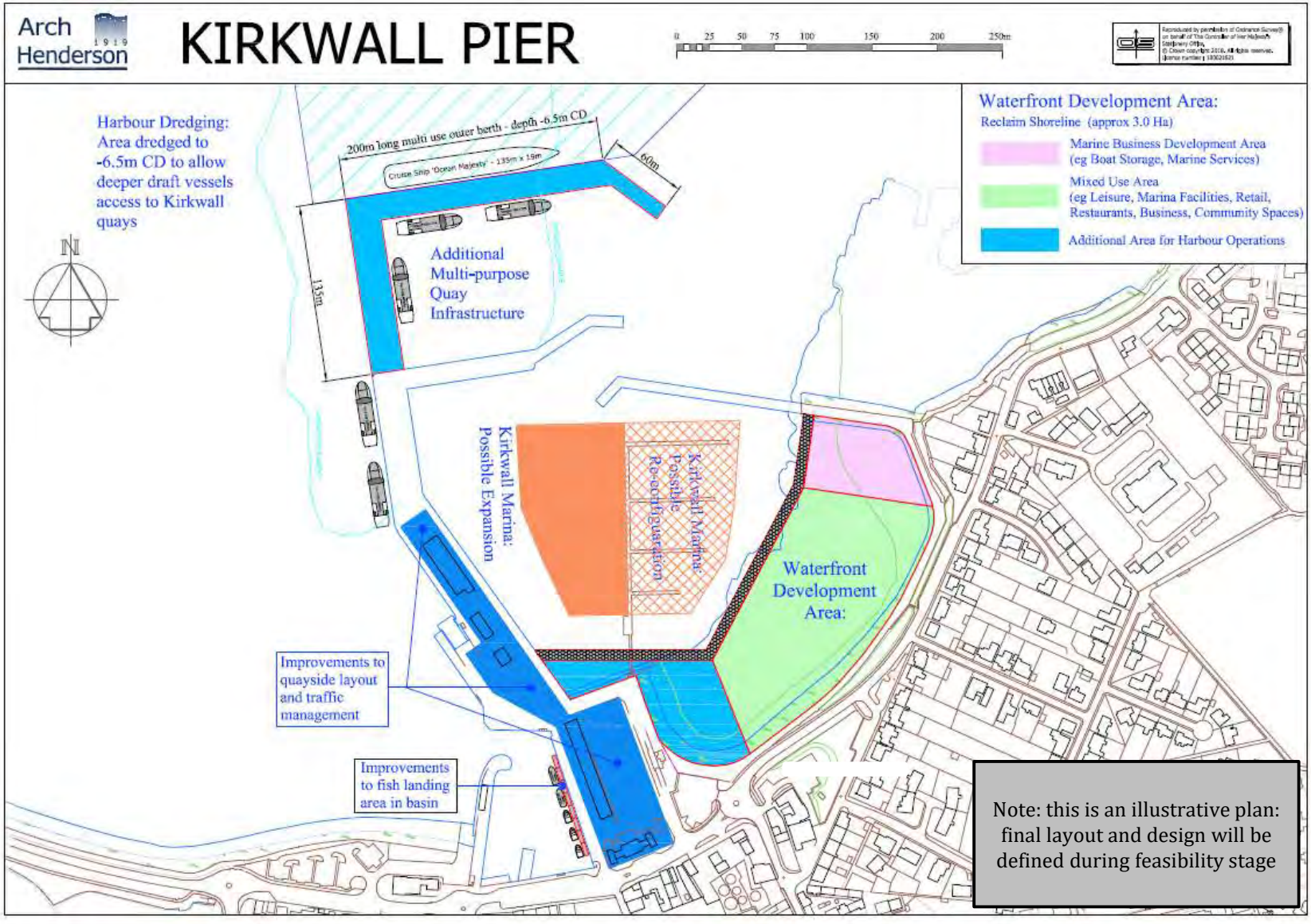
Improvements to fish landing areas

Aligns with the following outline requirements:
- Remove conflicts between pedestrians and operational activity
- Facilitate potential growth in fishing
- Improve safety for all harbour users

Working with key stakeholders in the fishing industry, improvements are planned for the fish landing area at Kirkwall. One option is to relocate the pilot boats and/or RNLI vessels away from this area, freeing up additional quayside for landing, as well as consideration of possible options opposite the crane shed, e.g. removal of railings, changes in traffic management and possible installation of pontoons. The RNLI vessel could sit at the east side of the main pier, for example.

Kirkwall Pier

Masterplan proposals at Kirkwall Pier



FISHER

Masterplan proposals at Kirkwall Pier – high level cost estimate (£m)

Project component	Cost[1]	Contingency[2]	Fees[3]	Total (£m)
New multi-purpose quayside infrastructure	24.930	2.493	1.842	29.265
Waterfront development (reclamation costs only)	3.344	0.334	0.255	3.933
Marina expansion (430m pontoon length allowed)	0.775	0.078	0.067	0.920
Total (projects costed so far)	**29.048**	**2.905**	**2.164**	**34.118**
Reconfiguration of buildings, waiting room, marshalling and traffic management system on Kirkwall Pier	*Cost unknown at present. Could assume construction of at least two new buildings.*			
Improvements to fish landing area in Basin (installation of pontoons, moving railings and relocation of pilot boats)	*Cost unknown at present. Could assume cost of original installation of railings and cost of pontoons and ramp for the east pier in the Basin.*			

- 1. Costs, as developed by Arch Henderson, are based on actual costs incurred on similar projects elsewhere. They are high level estimates and assume that each project is stand alone – should projects be grouped together then there may be savings through shared mobilisation and general item costs. Where a proposal is unlikely to be delivered by the Harbour Authority no cost estimate has been provided.
- 2. Contingency is assumed to be 10% construction risk and does not included Optimism Bias, which will still need to be assessed based on procurement routes finally chosen coupled with client knowledge of potential development constraints.
- 3. Consultant fees associated with design, feasibility and construction including third party Site Investigation cost estimates; excludes costs relating to HRO, legal aspects, EIA and VAT.

Hatston Pier and Terminal

Hatston Pier and Terminal is Orkney's primary commercial terminal and link south to Aberdeen and north to Shetland.

This multi-purpose infrastructure has been hugely successful in accommodating a range of operational activities including the largest cruise ships, renewable energy, ferries, oil and gas and cargo/livestock.

The plan for Hatston is focussed on reducing conflicts between users and operational activity and enabling growth across a range of economic sectors. Seasonal lack of availability of berths due to cruise with a resultant year round constraint on other vessel use would be resolved and the plan also considers how freight and traffic can be handled more efficiently and effectively.

Core proposals comprise a significant extension to the existing pier and expansion of landside area through reclamation to futureproof availability of sufficient land for harbour operations.

Multi-purpose deep water quayside infrastructure

Aligns with the following outline requirements:

- Enable Orkney to become a preferred supply base location for offshore oil and gas
- Provide necessary infrastructure to safeguard and attract renewable energy developments and technologies
- Encourage new developments in boat repair market supply chain
- Safeguard and grow aquaculture activity and supply chain
- Facilitate growth in freight traffic and increase efficiency of freight handling

The existing outer quay would be extended by 300m (with water depth of -10m CD) and there would be a 125m inner berth. There will be substantially more quayside available both for the existing pier and the extension.

Circa 7.5 hectares of additional land would be made available for harbour-related operations through reclamation.

There will also be an ex-pipe fuel supply and fuel storage facility in close proximity to the pier.

This new infrastructure will be able to accommodate a range of activities across several sectors (see overleaf).

As noted earlier, the design of new infrastructure here will be futureproofed so as to accommodate future provision and storage of alternative (less polluting/carbon-free) fuels and provision of shore power to smaller vessels where viable.

Multi-purpose deep water quayside infrastructure (cont.)

With the additional quay length and laydown area, and an ex-pipe fuel supply and storage facility, Hatston would be able to accommodate oil and gas supply operations.

There is scope to create new aquaculture facilities such as a harvesting/processing plant with quayside access, as well as other supply chain activities.

A boatyard with an undercover facility could be developed: this could be a small scale facility handling the smaller leisure, fishing and aquaculture boats (e.g. up to 100 tonnes) or a larger commercial facility incorporating a boatlift adjacent to the new pier infrastructure capable of handling vessels up to 800 tonnes

A facility in close proximity to the quay could be developed for handling renewable energy devices as well as sufficient laydown area.

Sites could be earmarked for the development of a logistics park/common user freight hub.

With regard to the storage of alternative fuels in the future careful consideration will be required regarding the location of such storage and any potential negative impacts on harbour-related operations and activity, particularly the lifeline ferry services which operate out of Hatston.

Reconfiguration of marshalling areas, parking and access

Aligns with the following outline requirements:
- Remove conflicts between pedestrians and operational activity
- Improve safety for all harbour users

This will reduce conflicts between different users and uses. Areas for car and freight marshalling will be reconfigured and there will be better defined pedestrian routes to and from the quayside*:* for example to the long stay car park and the main road. There is also potential for the reconfigured pedestrian access within the harbour area to connect to the proposed coastal path identified within the Kirkwall Urban Design Framework (KUDF).

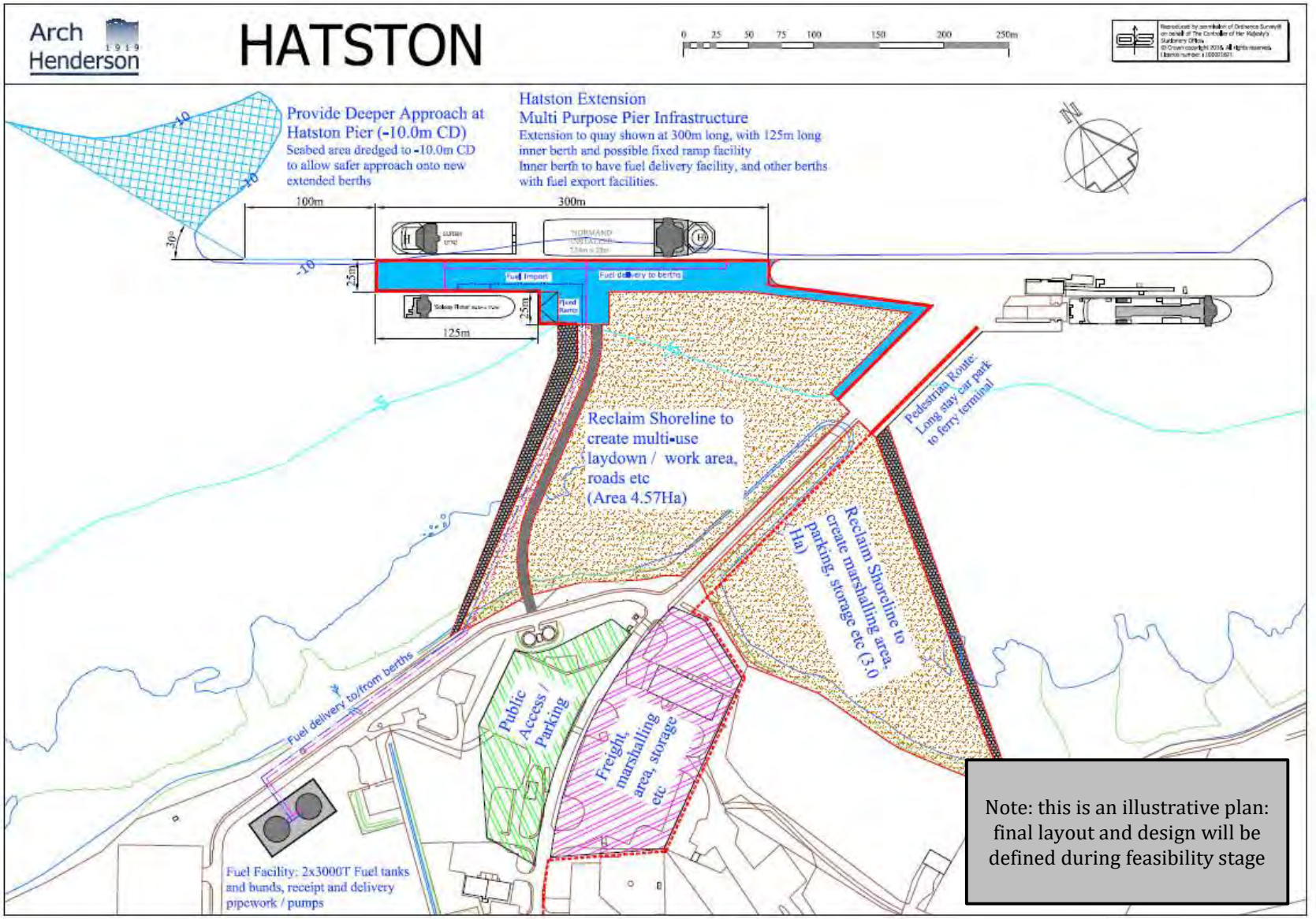
Options to promote sustainable transport will be explored at feasibility stage, such as the provision of electric vehicle charging points, electric bicycles, electric vehicles as part of car pooling schemes and linkages with existing and future walking and cycling networks.

New passenger reception facility

Aligns with the following outline requirements:
- Meet future requirements of external and internal ferry services and their users
- Enhance marine leisure and tourism in Orkney

In the future there may be a need to refurbish and/or extend the existing facility that caters for both ferry and cruise passengers on the quayside.

Masterplan proposals at Hatston



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Masterplan proposals at Hatston – high level cost estimate (£m)

Project component	Cost[1]	Contingency[2]	Fees[3]	Total (£m)
New deep water pier infrastructure (additional 300m quayside and water depth of -10m CD) including 4.75 hectares of reclamation	33.850	3.385	2.465	39.701
Additional reclamation of 3.0 hectares	2.934	0.293	0.074	3.301
Ex-pipe fuel supply and storage	1.900	0.190	0.000	2.090
Reconfiguration of freight marshalling, parking, pedestrian routes and public access	-	-	-	-
Total (projects costed so far)	**38.684**	**3.868**	**2.539**	**45.092**
Boatyard infrastructure (shiplift and facility)	*Cost will depend on what ground works are required and specification of shiplift and adjacent facility. Likely to be in region of £5m - £7m but cannot be estimated until a more detailed specification is provided.*			

- 1. Costs, as developed by Arch Henderson, are based on actual costs incurred on similar projects elsewhere. They are high level estimates and assume that each project is stand alone – should projects be grouped together then there may be savings through shared mobilisation and general item costs. Where a proposal is unlikely to be delivered by the Harbour Authority no cost estimate has been provided.
- 2. Contingency is assumed to be 10% construction risk and does not included Optimism Bias, which will still need to be assessed based on procurement routes finally chosen coupled with client knowledge of potential development constraints.
- 3. Consultant fees associated with design, feasibility and construction including third party Site Investigation cost estimates; excludes costs relating to HRO, legal aspects, EIA and VAT.

Scapa Pier

Scapa Pier is a key component of Orkney's critical infrastructure. As well as supporting Flotta Oil Terminal activities, STS and semi-submersible rig maintenance; it is the single point of entry for Orkney's entire supply of domestic and commercial hydrocarbon fuels.

Three tugs and one pilot boat are based at Scapa Pier, as well as commercial boats – all service vessels and platforms at anchor in Scapa Flow, as well as the provision of marine services for Flotta (this encompasses towage, pilotage, counter pollution, conservancy, port security, etc.). At present there is only just enough depth of water for tugs – in inclement weather they have to use other port facilities. There is limited availability of berthing and quayside space, impacting on operational safety and efficiency.

Fuels are discharged here using dedicated pipelines running from the pier directly into a tank farm located underground in close proximity to the pier, owned by Highland Fuels. One of the main concerns at present is that tankers are increasing in size: new vessels coming into the James Fisher fleet within the next five to ten years cannot be accommodated at Scapa Pier. At the same time it is unlikely that Highland Fuels would wish to relocate the tank farm until such time that it reaches the end of its usable life.

Another concern is that over time the nature of Orkney's fuel supply may change, particularly as climate change targets focus on reducing carbon footprint: in 20 years time we may be looking at a fuel supply comprising not only petrol, kerosene and diesel, but other fuels, such as LNG, hydrogen or even synthetically produced fuels.

Scapa Pier extension and deepening

Aligns with the following outline requirements:

- Provide necessary infrastructure to enhance resilience of Orkney's fuel supply
- Enable Orkney to attract more (semi-submersible) rigs/platforms for repair, supplies and crew changes
- Improve safety for all harbour users

The existing Scapa Pier would be lengthened by circa 100m, and dredging would provide deeper water (from -5m CD to -7.5m CD). The extension is angled with a wider quay. This would enable larger vessels to come alongside and increase berthing space. The quayside would be improved by making it the same level and removing any obstacles, as well as creating some additional laydown area shoreside.

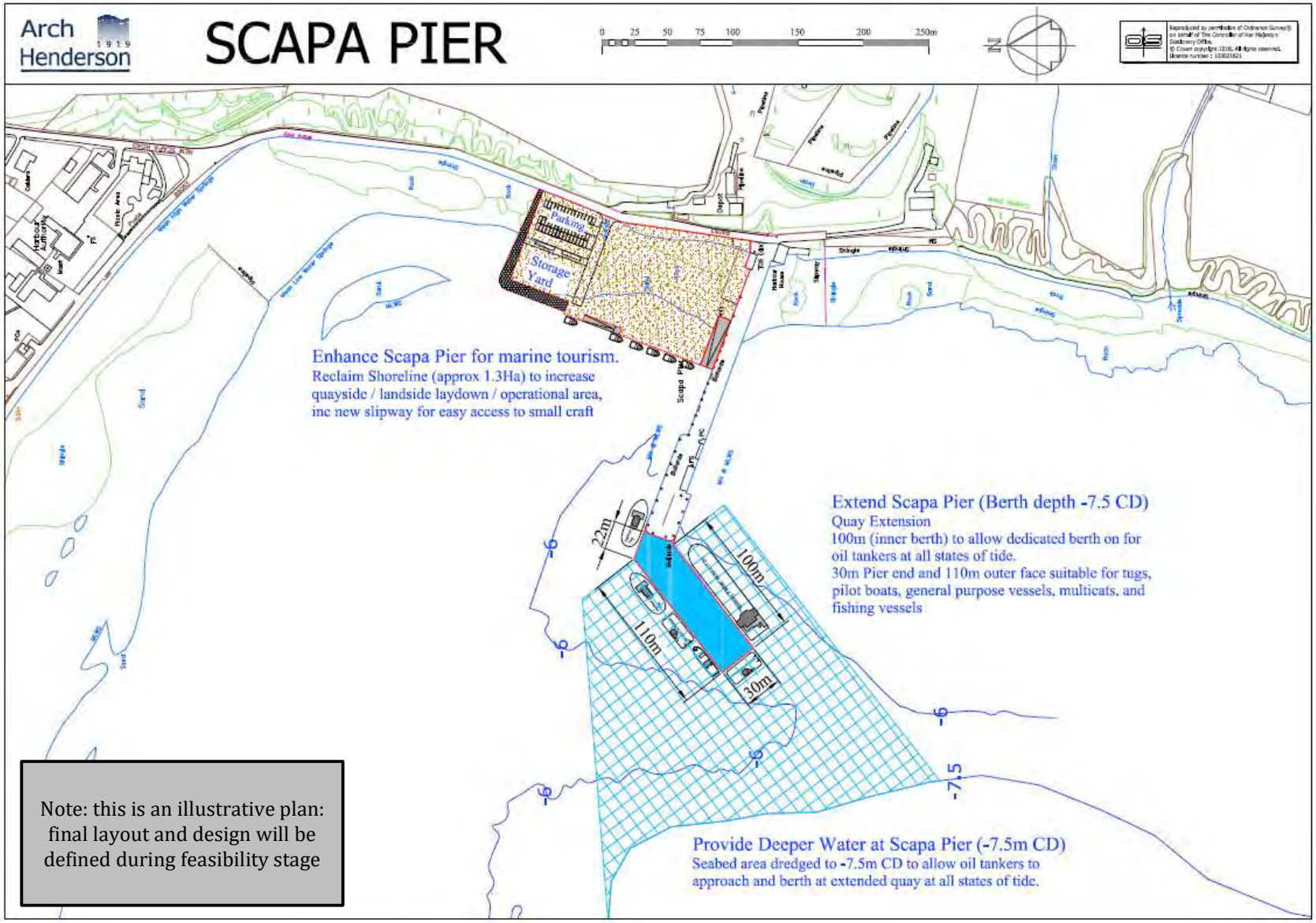
Additional shoreside area and marine leisure berths

Aligns with the following outline requirements:

- Enhance marine leisure and tourism in Orkney
- Enable Orkney to attract more (semi-submersible) rigs/platforms for repair, supplies and crew changes

Through reclamation an area adjacent to the shore would be made available for operational use, storage and/or parking. Several berths for marine leisure, and a small slip to service these would be incorporated – this could be a suitable location for vessels offering marine tours in Scapa Flow, or smaller commercial boats, for example. It is not envisaged that this would be a key location for visiting yachts.

Masterplan proposals at Scapa Pier



Masterplan proposals at Scapa Pier – high level cost estimate (£m)

Project component	Cost[1]	Contingency[2]	Fees[3]	Total (£m)
Scapa Pier angled extension (100m) (pier construction and dredging)	8.692	0.869	0.694	10.256
Increase laydown/operational area/slipway and marine leisure berths	2.302	0.230	0.200	2.732
Total	**10.994**	**1.099**	**0.894**	**12.988**

- 1. Costs, as developed by Arch Henderson, are based on actual costs incurred on similar projects elsewhere. They are high level estimates and assume that each project is stand alone – should projects be grouped together then there may be savings through shared mobilisation and general item costs. Where a proposal is unlikely to be delivered by the Harbour Authority no cost estimate has been provided.
- 2. Contingency is assumed to be 10% construction risk and does not included Optimism Bias, which will still need to be assessed based on procurement routes finally chosen coupled with client knowledge of potential development constraints.
- 3. Consultant fees associated with design, feasibility and construction including third party Site Investigation cost estimates; excludes costs relating to HRO, legal aspects, EIA and VAT.

Stromness and Copland's Dock

The harbour in Stromness is at the heart of this historic town which is located within the Hoy and West Mainland National Scenic Area (NSA). This vibrant harbour is a hub for ferry services, inshore fisheries, marine leisure, cruise and renewables. There are issues with access to the main pier in Stromness and there is competition for berthing space here too. Whilst the construction of Copland's Dock has enabled some operations to be moved out of the town centre, there remains issues of capacity, conflict of use and traffic and the flexibility of Copland's Dock to cater for different types of vessel, particularly small boats. If Copland's Dock could do this, there would be significant opportunity to remove heavy traffic from the historic town centre.

The plan for Stromness is focussed on improving the flexibility and usability of existing infrastructure, as well as creating capacity and facilities to enable growth in all sectors for the future.

Increasing flexibility and usability of Copland's Dock

Aligns with the following outline requirements:
- Facilitate potential growth in fishing
- Improve usability of pier infrastructure for smaller boats
- Improve local character and visual amenity for residents/visitors

This proposals involves increasing the number of fenders at Copland's Dock, which will enable smaller boats to use this infrastructure more easily, as per original design.

An additional area is proposed for reclamation, which will create a development opportunity for shore-based business – this is potentially an ideal location for the relocation of the Orkney Fishermen's Society (OFS) facility. Access to the Inner and Outer Holms will be preserved through this area. Whilst reclamation is considered here, it might also be possible to cut into the existing land behind the area, as an alternative to reclamation. The need to protect and conserve the Special Qualities of the NSA will be an important consideration in any future development of this area.

Expansion of Stromness marina

Aligns with the following outline requirements:
- Enhance marine leisure and tourism in Orkney

The marina in Stromness will be expanded with an additional 12 berths which could be earmarked for resident, visitor or commercial use.

Cruise tender pontoon

Aligns with the following outline requirements:
- Enable sustainable growth in cruise
- Enhance marine leisure and tourism in Orkney
- Remove conflicts between pedestrians and operational activity
- Improve local character and visual amenity for residents/visitors

A modest number of cruise liners call at Stromness each year both alongside and at anchor. Those at anchor tender in passengers generally to a pontoon within the marina. This can cause congestion and security issues with a mix of cruise passengers and marina users entering and exiting the marina facility at the same time.

From discussions with stakeholders during the community consultation period it has emerged that there is a need for some form of direct pontoon access for the cruise liners. It is envisaged that such a pontoon would be built to cope with Orkney weather and that it could be removed during the winter months.

The pontoon could also be used by vessels operating marine tours.

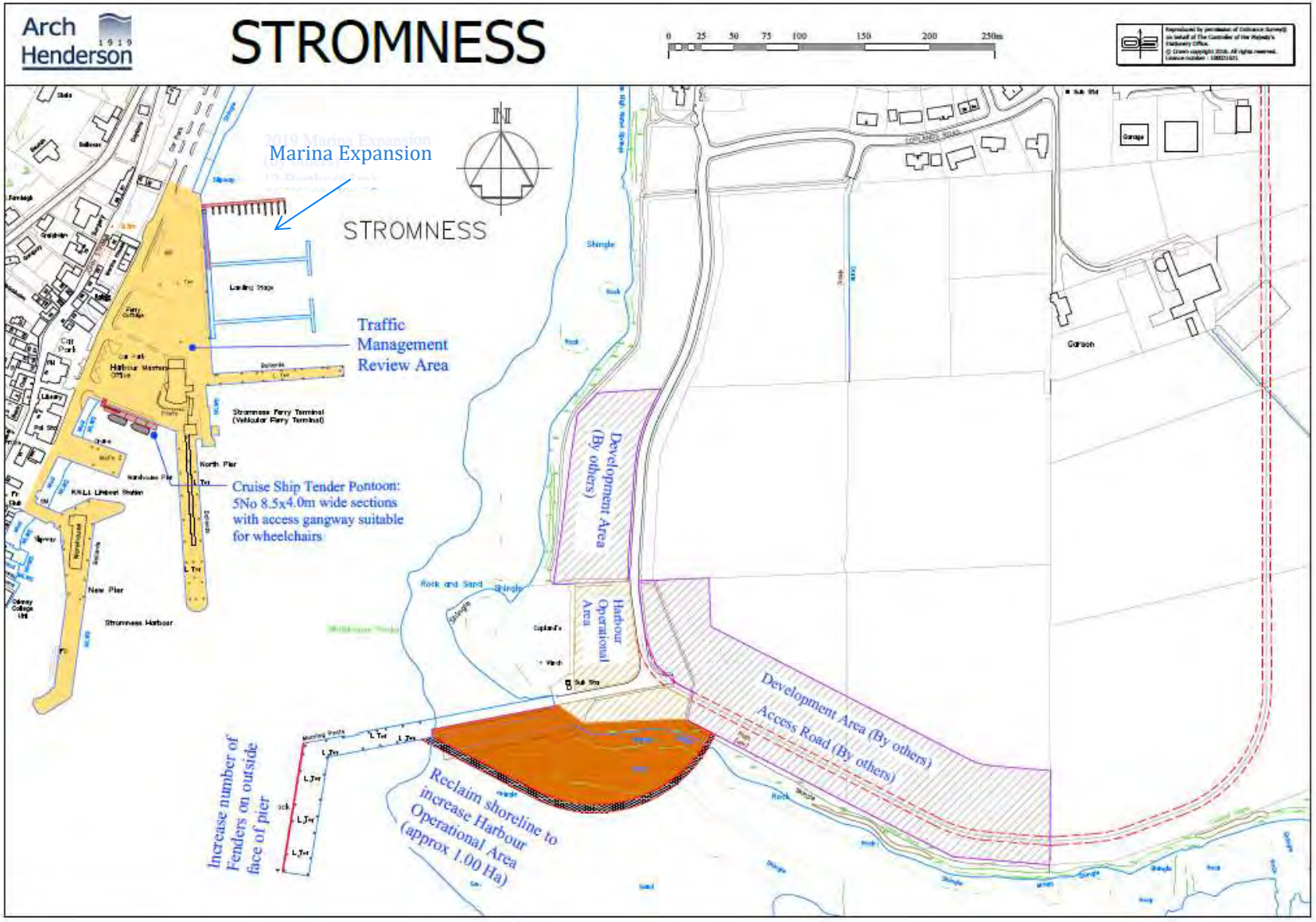
The quay adjacent to North Pier is considered a suitable location given there is sufficient water depth here.

Improvements to shoreside area and traffic management

Aligns with the following outline requirements:
- Remove conflicts between pedestrians and operational activity
- Improve safety for all harbour users
- Improve local character and visual amenity for residents/visitors

A review of current parking, pedestrian routes and traffic management and controls, as well as an evaluation of the location, condition and purpose of buildings and facilities on or close to the quayside in Stromness will be undertaken, which will determine what kind of improvements could be made: this might, for example, look at alternative parking arrangements and controls, reconfiguration of the marshalling area, relocation of marina facilities, waiting room facilities and signage. This should be done in alignment with the Stromness Multi-Modal Low Carbon Transport and Active Travel Hub project which is currently being taken forward.

Masterplan proposals at Stromness and Copland's Dock



Masterplan proposals at Stromness and Copland's Dock – high level cost estimate (£m)

Project component	Cost[1]	Contingency[2]	Fees[3]	Total (£m)
Infill fenders to Copland's Dock	0.200	0.020	0.010	0.230
Reclamation of land at Copland's Dock	1.549	0.155	0.055	1.759
Expansion of Stromness Marina	0.250	0.030	0.010	0.290
Cruise tender pontoon	0.195	0.015	0.005	0.215
Improving shoreside layout and traffic management	*Cost unknown at present.*			
Total (projects costed so far)	**2.194**	**0.22**	**0.08**	**2.494**

- 1. Costs, as developed by Arch Henderson, are based on actual costs incurred on similar projects elsewhere. They are high level estimates and assume that each project is stand alone – should projects be grouped together then there may be savings through shared mobilisation and general item costs. Where a proposal is unlikely to be delivered by the Harbour Authority no cost estimate has been provided.
- 2. Contingency is assumed to be 10% construction risk and does not included Optimism Bias, which will still need to be assessed based on procurement routes finally chosen coupled with client knowledge of potential development constraints.
- 3. Consultant fees associated with design, feasibility and construction including third party Site Investigation cost estimates; excludes costs relating to HRO, legal aspects, EIA and VAT.

Scapa Deep Water Quay

There is no deep water pier infrastructure in Scapa Flow located on the Orkney mainland coast. As part of option development consideration was given to possible locations for deep water quayside infrastructure in proximity to the existing Scapa Pier, with a suitable site potentially identified to the south of Scapa Pier.

Aligns with the following outline requirements:

- Enable Orkney to become a preferred supply base location for offshore oil and gas
- Enable Orkney to attract more rigs/platforms for repair, supplies and crew changes
- Provide necessary infrastructure to safeguard and attract renewable energy activity and technologies

This proposal comprises 300m of quayside with water depth of -20m CD, and a 75m wide approach quay with 5+ hectares of landside area – options for an extended pier or inclusion of dolphins could be considered during feasibility stage, depending on market opportunities at the time.

The main purpose of this facility would be to undertake any/multiple industry activity that requires both deep-water berthing and large laydown area. There are specific market opportunities in the offshore wind and oil and gas sectors. This is also a potential location for the development of a LNG storage and supply hub.

With regard to offshore wind, there are several lease areas earmarked for development around Orkney, with Orkney the preferred location as a hub for construction and O&M – Scapa Deep Water Quay is the optimal site for this activity.

In the oil and gas sector large structures and vessels could come alongside for repairs and maintenance.

Scapa Flow is already identified as a national strategic asset and this development will further enhance its role as such.

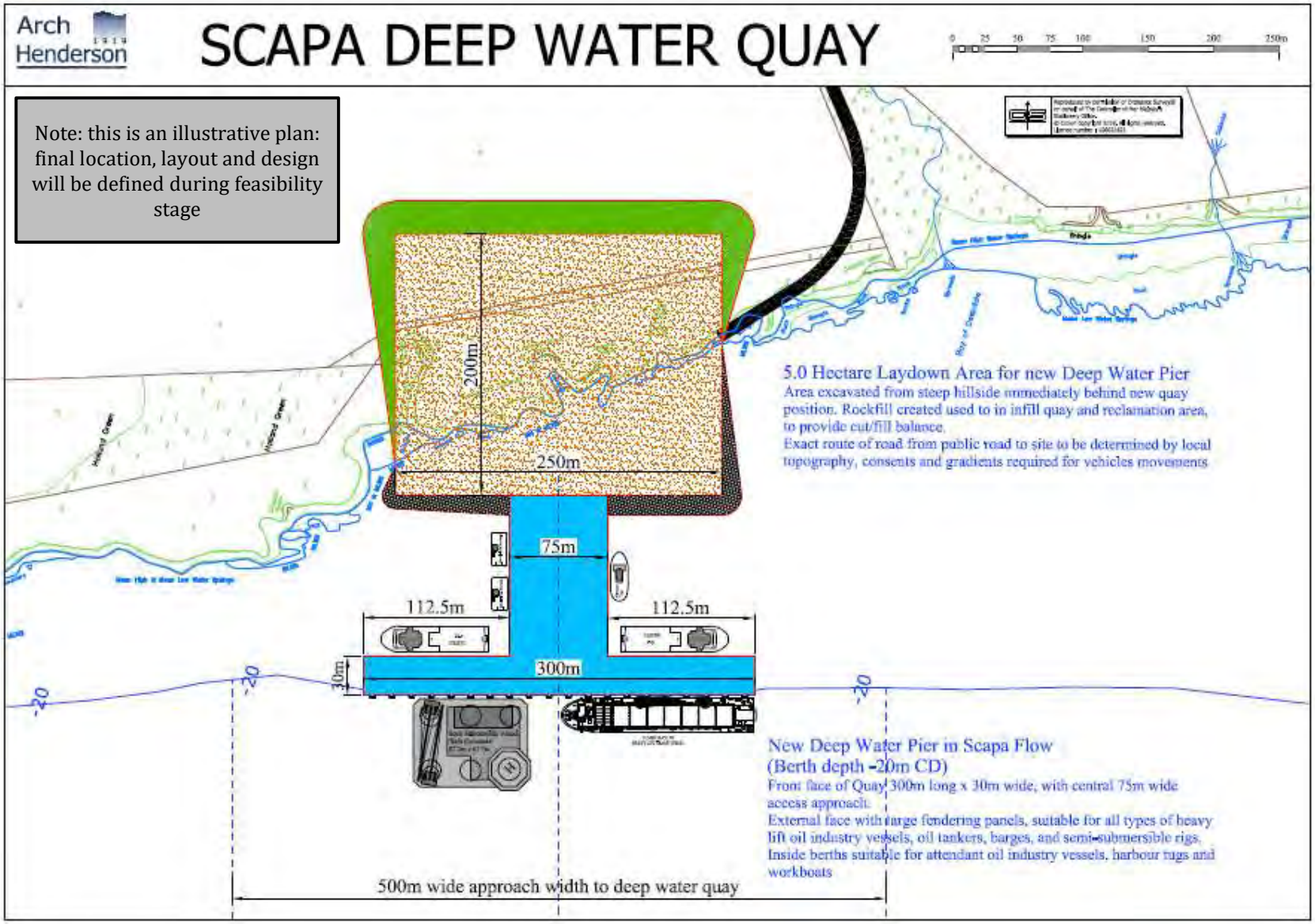
Scapa Flow

There is an opportunity for Scapa Deep Water Quay to be the optimal location for the development of a LNG storage and distribution hub for the supply of lower carbon LNG locally in Orkney and to create a large scale LNG supply and bunkering service for shipping. The facility could potentially take on a variety of other roles and operations as industry develops new technologies and fuels in light of the new decarbonisation targets.

'It is essential that purpose-built staging port facilities, such as the Scapa Deep Water Quay, are available to maximise the weather window for offshore construction. A new, purpose-built deep-water quay in the natural shelter of Scapa Flow would service the growing offshore wind market in the North of Scotland and, in doing so, become a great asset to Orkney's economy.'

Source: offshore windfarm developer

Scapa Deep Water Quay – masterplan proposals



Masterplan proposals at Scapa Deep Water quay – high level cost estimate (£m)

Project component	Cost[1]	Contingency[2]	Fees[3]	Total (£m)
Deep water facility in Scapa Flow (300m quayside and -20m CD water depth, 75m wide approach quay and 5+ hectares of land reclamation	**65.660**	**4.050**	**6.566**	**76.276**

- 1. Costs, as developed by Arch Henderson, are based on actual costs incurred on similar projects elsewhere. They are high level estimates and assume that each project is stand alone – should projects be grouped together then there may be savings through shared mobilisation and general item costs. Where a proposal is unlikely to be delivered by the Harbour Authority no cost estimate has been provided.
- 2. Contingency is assumed to be 10% construction risk and does not included Optimism Bias, which will still need to be assessed based on procurement routes finally chosen coupled with client knowledge of potential development constraints.
- 3. Consultant fees associated with design, feasibility and construction including third party Site Investigation cost estimates; excludes costs relating to HRO, legal aspects, EIA and VAT.

Lyness

Lyness has in the past been earmarked for a variety of operational activities – particularly the development of a container hub, as a potential base for oil and gas and renewable sector operations. In the short-term it could be used as a support base for Scapa Flow, as a laydown and storage area. It could also serve as a suitable site for aquaculture operations such as the building and maintenance of salmon cages. For these operations no additional infrastructure improvements are required. There are longer term opportunities particularly in the oil and gas and renewable sectors; a potential location for decommissioning of smaller scale items in the longer term; a service base for some offshore wind activities around Orkney or handling of renewable devices as and when tidal/wave energy projects come on stream. These activities would be dependent on the size and draft of vessels requiring access to the pier, as well as clear intentions from the market.

Underlying issues at Lyness are summarised below.

Creation of hard standing areas

Aligns with the following outline requirements:
Provide necessary infrastructure to safeguard and attract renewable energy activity and technologies

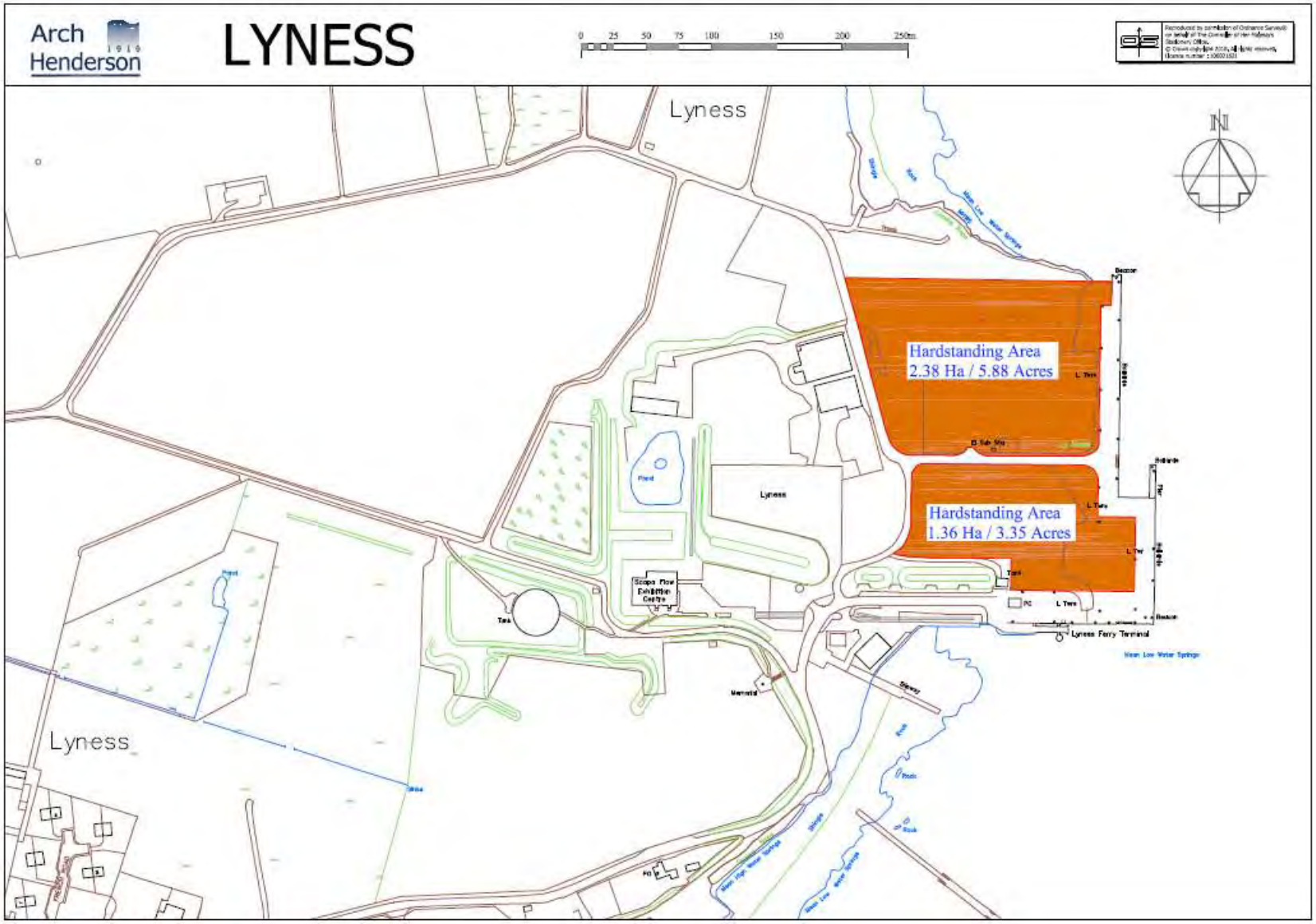
How the brownfield land would be developed and to what extent will depend on the nature of future activity and requirements thereof.

An initial step might be to create hard standing across the two areas closest to the quay edge – 5.88 acres and 3.35 acres respectively (just under 40,000 square metres), providing a suitable storage or yard area.

Costs are based on 40mm Bitmac and 250mm thick reinforced concrete slab plus some elements of drainage.

- Limited water depth: there is only -8m CD at one section of the quay, decreasing to -5m CD along the remaining quay. The access channel has greater depth but significantly less than the -20m CD as planned for Scapa Deep Water Quay.
- There are issues with developing the infrastructure as the existing pier is a listed historic structure.
- To reach a depth of -15m CD or more would require a considerable volume of dredging both in the channel and at a new quayside built out from the existing infrastructure. It is not possible to dredge at the existing pier without undermining the toe of the quay.
- In certain conditions a swell affects Lyness; there are no swell issues on the east side of Scapa Flow.
- For any commercial activity whilst it would be extremely beneficial for the island community in terms of economic activity, Lyness could be less attractive to the market given its location is on an island and the need for double handling of supplies and equipment.

Lyness – masterplan proposals



Masterplan proposals at Lyness – high level cost estimate (£m)

Project component	Cost[1]	Contingency[2]	Fees[3]	Total (£m)
Area 1 hard standing (5.88 acres)	5.718	0.570	0.250	6.538
Area 2 hard standing (3.35 acres)	1.735	0.175	0.110	2.020
Total	**7.453**	**0.745**	**0.360**	**8.558**

- 1.Costs, as developed by Arch Henderson, are based on actual costs incurred on similar projects elsewhere. They are high level estimates and assume that each project is stand alone – should projects be grouped together then there may be savings through shared mobilisation and general item costs. Where a proposal is unlikely to be delivered by the Harbour Authority no cost estimate has been provided.
- 2. Contingency is assumed to be 10% construction risk and does not included Optimism Bias, which will still need to be assessed based on procurement routes finally chosen coupled with client knowledge of potential development constraints.
- 3. Consultant fees associated with design, feasibility and construction including third party Site Investigation cost estimates; excludes costs relating to HRO, legal aspects, EIA and VAT.

Capital expenditure – summary

The table below presents a summary of capital expenditure:

- High level capital costs include consultant fees associated with design, feasibility and construction.
- Costs exclude those relating to HRO, legal aspects, EIA and VAT.
- A contingency of 10% has been applied to all the costs except the engineering fees and the site investigations and consents. This is construction risk and does not include Optimism Bias, which is modelled as a sensitivity test.
- Costs assume that each project is stand alone – should projects be grouped together then there may be savings through shared mobilisation and general item costs.

Proposal location (£m0)	Cost	Contingency	Fees	Total
Kirkwall Pier	29.048	2.905	2.164	34.118
Hatston	38.684	3.868	2.539	45.092
Scapa Pier	10.994	1.099	0.894	12.988
Scapa Deep Water Quay	65.660	4.050	6.566	76.276
Stromness	2.194	0.22	0.08	2.494
Lyness	7.453	0.745	0.360	8.558
Total	**154.03**	**12.887**	**12.603**	**179.53**

4. ECONOMIC CASE

Introduction

The masterplan comprises a range of proposals that will **significantly enhance the operability and attractiveness of Orkney's harbour infrastructure** through the construction of new deep water quayside infrastructures, as well as extensions and enhancements to existing harbours, marina expansion, the creation of additional land for development and improvements to quayside areas and traffic management.

These proposals will create efficiencies within existing operations as well as enable Orkney Harbours to attract more business and generate more revenue thus ensuring financial sustainability for the longer term and ultimately safeguarding and creating employment opportunities in Orkney.

To better understand the benefits associated with each of the masterplan proposals an economic and financial analysis has been conducted, as part of a detailed Outline Business Case (OBC). This analysis looks at the costs and benefits of each proposal, both the financial return to Orkney Harbours, and the wider economic benefit to Orkney as a whole.

High level results from this analysis are presented here along with a qualitative description of how the proposals will be beneficial (see Appendix D).

The quantitative economic and financial analysis has been done for all proposals except several elements at Stromness & Copland's Dock and Lyness – for these there is a qualitative summary of beneficiaries and impacts also at Appendix D.

Core aspects of the financial and economic analysis

The analysis considers the impact of the masterplan proposals (the 'With project' case) against what would have happened without the proposals (the 'Reference case' or 'Do nothing').

In the 'With project' case three potential scenarios have been defined: High case, Base case and Low case which are based on realistic assumptions about what could happen in each of the markets.

The masterplan proposals considered in the economic and financial analysis together return a very positive economic Net Present Value (NPV) in the Base case, which indicates that from an economic viewpoint, they are worthwhile.

Projects expected to generate **£464m** of monetarised benefits (to 2050)

These projects will have a transformational impact on Orkney's economy and society.

Not all benefits have been quantified; thus the quantitative results presented will be higher in reality.

NPV (to 2050)
High case: £194.5m
Base case: £92.8m
Low case: -£30.9m

Base case (2050):
119 jobs
£13.7m GVA

Summary results by proposal

There are considerable uncertainties regarding the capital costs, particularly for Scapa Deep Water Quay. As the projects progress and more information from surveys and design work becomes available, these risks will be reduced as costs are refined. On the advice of the engineers, we have included optimism bias on the capital costs as shown below.

Even allowing for substantial escalation in capital costs, the **projects still return a positive NPV overall in the Base case**:

Project	Capital cost Base case	Optimism Bias	Capital cost (with Optimism Bias)	NPV Base case	NPV (with Optimism Bias)
Kirkwall Pier	34,118	30%	39,927	-£1.3m	-£5.7m
Hatston	45,092	30%	52,828	£59.9m	£53.2m
Scapa Pier	12,988	30%	15,187	-£0.1m	-£2.0m
Stromness	750	30%	884	£4.6m	£4.5m
Scapa Deep Water Quay	76,276	70%	115,673	£29.7m	-£6.2m
All projects	169,224		224,498	**£92.8m**	**£43.9m**

Note: the optimism bias has been calculated by replacing the 10% contingency on the main works (no contingency was included for fees and licences) with the percentages shown above. The outcome will therefore not be equal to the original cost plus the optimism bias; it will be lower.

It should also be noted that Lyness and reclamation at Copland's Dock have been excluded from the economic analysis.

Summary results: Base case

All projects	2020	2021	2022	2023	2024	2025	2026	2030	2040	2050
Costs										
Capital expenditure	£2,838	£6,149	£2,925	£45,320	£45,195	£34,130	£247	£0	£0	£0
Operating costs	£0	£0	£10	£10	£63	£63	£739	£808	£808	£808
Total costs	**£2,838**	**£6,149**	**£2,935**	**£45,331**	**£45,258**	**£34,193**	**£985**	**£808**	**£808**	**£808**
Benefits										
Total direct benefit	**£0**	**£0**	**£98**	**£98**	**£750**	**£763**	**£7,382**	**£14,615**	**£14,472**	**£14,472**
Total indirect and induced	£0	£0	£26	£26	£181	£185	£2,066	£4,700	£4,692	£4,692
Total benefits	**£0**	**£0**	**£124**	**£124**	**£932**	**£948**	**£9,448**	**£19,316**	**£19,164**	**£19,164**
Net benefits	**-£2,838**	**-£6,149**	**-£2,812**	**-£45,207**	**-£44,327**	**-£33,245**	**£8,463**	**£18,508**	**£18,356**	**£18,356**
NPV at 3.5% (£m)	**£92.8m**									
Financial										
Costs	£2,838	£6,149	£2,935	£45,331	£45,258	£34,193	£985	£808	£808	£808
Harbour income	£0	£0	£0	£0	£530	£530	£2,384	£3,986	£3,757	£3,757
Net revenue	**-£2,838**	**-£6,149**	**-£2,935**	**-£45,331**	**-£44,728**	**-£33,663**	**£1,398**	**£3,178**	**£2,949**	**£2,949**
Financial IRR	**-5.7%**									

The masterplan projects return a very positive Net Present Value in the Base case, which indicates that from an economic viewpoint, the projects are worthwhile. On an individual basis, Hatston, Scapa Deep Water Quay and Stromness all generate positive NPVs. Scapa Pier and Kirkwall Pier have slightly negative NPVs, however, it is important to recognise that the role of these investments is not purely commercial. For Scapa Pier, the main objective is to increase resilience of Orkney's fuel supplies and facilitate the development of activities at other locations through the support provided by harbour vessels. Some of the benefits of the other three projects could be attributed to security of fuel supplies as without it businesses would face risks.

Summary of GVA impacts (Base case)

Base case (£000s)	2020	2021	2022	2023	2024	2025	2026	2030	2040	2050
GVA										
Total direct GVA	£0	£0	£62	£62	£303	£312	£2,984	£9,796	£8,917	£8,917
Total indirect and induced	£0	£0	£16	£16	£75	£77	£1,298	£5,017	£4,743	£4,743
Total GVA	**£0**	**£0**	**£77**	**£77**	**£378**	**£390**	**£4,282**	**£14,814**	**£13,660**	**£13,660**

The GVA safeguarded or created in the Base case reaches £14.8m by 2030 (it tails off by 2040 because of the assumptions regarding windfarm installation). The multipliers used are those for the Scottish economy, adjusted for Orkney. This approach should give a reasonable estimate of the impacts within Orkney, and because they are based on Scottish level multipliers, they relate only to impacts that would be fully retained in Scotland.

Summary of employment impacts (Base case)

Base case	2020	2021	2022	2023	2024	2025	2026	2030	2040	2050
Direct employment	35	35	38	38	39	40	53	103	95	95
Indirect and induced employment	14	14	14	14	15	15	18	28	25	25
Total employment	**49**	**49**	**52**	**52**	**54**	**54**	**71**	**131**	**119**	**119**

The number of jobs (FTE) safeguarded or created in the Base case rises to 119 by the end of the period. These include indirect and induced employment. The multipliers used are those for the Scottish economy, adjusted for Orkney. This approach should give a reasonable estimate of the impacts within Orkney, and because they are based on Scottish level multipliers, they relate only to impacts that would be fully retained in Scotland.

5. ENVIRONMENTAL CONSIDERATIONS

Introduction

A Strategic Environmental Assessment (SEA) of the Draft Orkney Harbours Masterplan Phase 1 and a Habitats Regulations Appraisal (HRA), including Appropriate Assessment, have been undertaken by environmental consultants.

- The aim of the SEA is to fulfil the requirement of EU Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (the SEA Directive), as transposed into Scottish Law by the Environmental Assessment (Scotland) Act 2005.
- A Habitats Regulations Appraisal (HRA) is required for all plans deemed likely to have an adverse effect on a protected 'Natura 2000' site. Natura 2000 is the Europe-wide network of protected sites developed under the European Commission's Habitats Directive (Directive 92/43/EEC) and Birds Directive (79/409/EEC). Appropriate Assessment (AA) is the second stage of the HRA process, whereby the first stage (or screening process) has either determined the plan or project, alone or in combination with other plans or projects, is likely to have a significant effect on a Natura 2000 site.

This section presents:

1. A high-level summary of the SEA Environmental Report, potential impacts and mitigation measures.
2. HRA and AA findings.
3. Comments from SNH on the AA.
4. Comments from the Scottish Environment Protection Agency (SEPA) made during the Orkney Harbours Masterplan consultation process relating to flood risk and key regulations.

Summary of SEA findings

The Environmental Report identifies, describes and evaluates the likely significant effects of the masterplan proposals: the assessment of effects is based around a set of SEA objectives and concludes that there is the potential for negative effects on air, biodiversity, flora and fauna, climatic factors, cultural heritage, landscape, material assets, population and human health, soil and water from implementation.

Good planning and selection of mitigation measures and implementation of them may mitigate many of these potential negative effects. Potential environmental effects on the SEA topics and examples of potential mitigation measures are presented overleaf and in Appendix E.

SEA: potential environmental effects arising from the masterplan proposals

SEA topic	Potential effects
Air	• May include increased emissions and dust (during construction); change to local air quality; and additional traffic (sea and road) could lead to higher future emissions during the operation phase. This could be mitigated as shipping and freight sectors move to lower carbon fuel options.
Biodiversity, flora and fauna	• Direct habitat loss and disturbance, both on land and the sea; may include underwater noise and visual impacts resulting in disturbance of birds and marine mammals; effects on designated sites, e.g. disturbance to birds, resulting in displacement from traditional foraging areas (either through vessel movements or disturbance or loss of habitats and species during construction and operation); and the potential introduction and spread of invasive non-native species.
Climatic factors	• May include increase in Green House Gas (GHG) and carbon footprint during construction and operation.
Cultural heritage	• May include disturbance of archaeology during construction; impacts on conservation areas and listed buildings; and long-term effects due to change in the cultural setting.
Landscape	• May include changes to landscape character; effects on the special qualities of the Hoy and West Mainland National Scenic Area; and general deterioration of visual amenity/seascape.
Material assets	• Impacts could arise due to an increase in waste due to dredging and additional vessels visiting harbours and piers. Increased wear on certain roads due to increased traffic.
Population and human health	• May include effects on the safety of harbour users as introduction of new structures present physical barriers affecting navigation; this as well as increased vessel movements could lead to an increase in accidents and incidents. There could also be health effects from increased dust and emissions and disturbance and nuisance impacts from construction and increased shipping traffic. Benefits include sustainable use of material assets through the enhancement of existing port facilities. The development and enhancement of facilities could lead to employment opportunities (both during construction and operation).
Soils	• Negative effects on soils include introduction of new sources of pollution; erosion of coastline due to changes in wave climate; and effects on soil function and land use changes.
Water	• Negative effects on water include degradation of water quality due to short term mobilisation of contaminated sediments and turbidity impacts; hydrodynamic changes due to changes to the shoreline and dredging; and follow on morphological changes, though these are expected to be minor. In addition, potential for degradation of water quality through accidental release of fuel or vessel containment.

Mitigation and enhancement measures

Mitigation measures have been identified through the SEA and HRA processes at plan level and will be further developed during the Environmental Impact Assessment (EIA) at project level and through detailed planning and design – when the specifics of the developments can be optimised through detailed feasibility studies and design in order to limit the potential impacts on sensitive receptors.

The table opposite highlights examples of key mitigation measures proposed in the SEA, split by those required prior to construction to inform proposals and those during construction and operation intended to offset impact. The full table is presented at Appendix E.

The timing of construction works should be planned to avoid the potential for negative cumulative impacts or inter-relationships with other schemes, plans or projects, as well as seeking to minimise and avoid sensitive time periods for designated species.

All works and planning of works should be undertaken with respect to all relevant legislation, licencing and consent requirements and recommended best practice and adherence to NetRegs environmental guidance for businesses.

Examples of mitigation and enhancement measures	
During design optimisation/ EIA	• Surveys to determine European Protected Species and basking shark presence. • Ecological and environmental surveys. • Habitat surveys. • Bird surveys. • Archaeological surveys. • Landscape and visual assessments. • Navigational risk assessments. • Water Framework Directive assessments. • Detailed Flood Risk Assessments. • Hydrodynamic modelling and surveys. • Agree a dredging mitigation strategy, including identification of an appropriate disposal site. • Development of a Construction Environmental Management Plan.
During construction and operation	• Appointment of Ecological Clerk of Works. • Implementation of Construction Environmental Management Plan. • Adherence to best practice sector-specific methodologies as provided in NetRegs. • Timing, e.g. undertake certain types of construction work during less sensitive periods to avoid disturbance to birds. • Presence of marine mammal observer where works may generate loud underwater noise. • Supervision by qualified archaeologist where required. • Re-use of dredged materials where possible. • Implement dredging mitigation strategy. • Post-construction landscaping, re-vegetation and habitat enhancement to benefit biodiversity and visual appearance.

Summary of HRA screening process

The assessment of likely significant effect (LSE) during the HRA screening process concluded that the following sites and pressures should be subject to an AA:

Pressure	Site
Visual disturbance	Hoy Special Protected Area (SPA) Orkney Mainland Moors SPA North Orkney Proposed SPA (pSPA) Orkney Inshore Waters Draft SPA Scapa Flow pSPA
Introduction of light	North Orkney pSPA Orkney Inshore Waters Draft SPA Scapa Flow pSPA
Changes to prey availability	North Orkney pSPA Orkney Inshore Waters Draft SPA Scapa Flow pSPA
Underwater noise changes	Faray and Holm of Fara Special Areas of Conservation (SACs) Sanday SAC
Introduction or spread or non-indigenous species	Loch of Stenness SAC

Summary of Appropriate Assessment findings

The AA concluded that the implementation of the Orkney Harbours Masterplan will not have any adverse effects on the integrity of SACs SPAs, pSPAs and draft SPAS in the area during site investigation and operation phases – there may however be adverse effects during construction.

Given uncertainties around the final project details in the plan level assessment, the conclusion of any adverse effect on site integrity has been deferred to project level HRA. At the project stage detailed mitigation will be proposed, if necessary, to avoid or minimise adverse effects.

The in-combination assessment concluded that the implementation of the Masterplan in combination with several renewable energy development sites (e.g. Brims Tidal Development, Lashy Sound Tidal Array, Billia Croo and Falls of Warness test sites) has the potential to cause adverse effects through visual disturbance and underwater noise changes, on the European sites located within Orkney.

The AA made four key recommendations:

- To review and update HRA at project level and ensure that the development of other relevant plans and projects are considered in the in-combination assessment.
- As masterplan proposals progress further targeted bird surveys are undertaken to inform project-level EIAs.
- Further investigation will be required to determine foraging potential for black-throated diver and goldeneye within Scapa Flow.
- Moult periods should be confirmed for bird species that are qualifying features of the Scapa Flow, North Orkney pSPAs and the Orkney Inshore Waters draft SPA.

SNH comments on the AA

Comments received from SNH on the AA comprise the following:

- Agreement that following project level mitigation it may be possible to conclude no adverse effects on site integrity for harbour and grey seals at Sanday SAC and Faray and Holm SAC.
- Agreement that the Masterplan will not lead to adverse effects on Loch of Stenness SAC.
- Agreement that based on information provided it is unlikely that there will be adverse effects of loss of prey supporting habitat on site integrity for bird species associated with the pSPAs.
- There could be potential disturbance to birds during the site investigation at Kirkwall, Hatston, Scapa Pier and Scapa Deep Water Quay. This will be assessed at the project-level HRA.
- SNH believe that further assessment is required of vessel movements to assess visual disturbance on the qualifying interests of the pSPAs.
- Hen harrier and short eared owl features of Orkney Mainland Moors SPA and peregrine falcon and arctic skua of Hoy SPA can be screened out of further assessment.
- The in-combination effects assessment should screen in fish farm sites for consideration as some had LSE with respect to several qualifying interests of the Scapa Flow pSPA.

In response to the overall conclusion of the AA – that any conclusions of any adverse effect on site integrity has been deferred to project level HRA – SNH advise that, for the masterplan to be adopted there needs to be acknowledgement that individual projects will only go ahead if there is no adverse effect on site integrity.

For each masterplan proposal an HRA will be undertaken at project stage which will build upon the information provided within the AA and include detailed mitigation if necessary to avoid or minimise adverse effects to ensure no adverse effect on site integrity.

Comments from SEPA on flood risk

The Scottish Environment Protection Agency (SEPA) stated that they have no site-specific flood risk advice on the draft plan other than to welcome the commitment for each development to be subject to a detailed Flood Risk assessment.

SEPA went on to provide the following key comments:

- *If consulted at the detailed plan stage, SEPA will be able to provide an approximate 1 in 200 year coastal flood level for each area based on the most up-to-date extreme still water level calculations using the Coastal Flood Boundary Method.*
- *The expected sea level rise for the Orkney Islands is 0.93m by 2100 based on the latest UK climate change predictions reported in 2018. SEPA recommend that this allowance is taken into consideration to ensure that any development is sustainable and to account for uncertainties and the effects of wave action.*
- *With regards to leisure development such as cafés, SEPA recommend a minimum freeboard of 600mm above the flood level is applied to finished floor levels.*
- *It should be noted that, without further flood risk information, we would object to any proposals for overnight accommodation, or any development which falls within the 'Highly Vulnerable Uses' category or our Land Use Vulnerability Guidance.*

Comments from SEPA on regulatory requirements

SEPA provided comment on regulatory requirements:

- *The diversification into other industrial sectors through the ability to handle larger vessels brings with it the possibility that environmental permitting or licensing of associated infrastructure may be required.*
- *Proposals for a fuel storage facility at Hatston would be subject to COMAH regulations. Similarly, any LNG/LPG bunkering hub/storage facility is likely to be captured under the COMAH Regulations and require the production of a Pre-Construction Safety Report.*
- *Development at Lyness will be on a brown field site. There have been previous discussions regarding the need for soil contamination investigation and remediation at this site that will need to be revisited as part of any development here.*
- *A Controlled Activities Regulations (CAR) construction site licence is required for management of surface water run-off from a construction site, including access tracks, which is more than four hectares, is in excess of 5km, or includes an area of more than one hectare or length of more than 500m on ground with a slope in excess of 25° (e.g. Scapa Deep Water Quay). Site design may be affected by pollution prevention requirements and SEPA strongly encourages the applicant to engage in pre-CAR application discussions.*
- *For land reclamation the EIA will be important in determining any potential significant effects and to identify any required mitigation. As the proposals progress SEPA would like details (e.g. quantity, type, source) of appropriate infill material to demonstrate no waste material will be used.*

6. MANAGEMENT AND COMMERCIAL CONSIDERATIONS

Introduction

The masterplan sets out a vision for Orkney Harbours. It is a live document and should be reviewed regularly so that it remains relevant.

This section considers aspects that are key to the implementation of masterplan proposals:

- Potential phasing of proposals.
- Project dependencies.
- Planning policy framework.
- Partnerships and engagement.
- Funding.
- Implementation.

Potential phasing of proposals

The phasing of proposals ultimately depends on a number of key factors:

- Are any proposals critical in terms of maintaining operational activity, safety, etc?
- Are there dependencies between proposals which might influence when they are delivered?
- Is there any merit in delivering some proposals in a phased approach – e.g. cost savings?
- What are the key priorities, are there 'quick wins' that can be delivered easily and quickly but which also offer clear value for money?
- What is the appetite among stakeholders regarding significant investment in infrastructure with a view to securing long-term benefit for Orkney?

A clear understanding of the financial and economic impacts will make it easier to determine which proposals should be prioritised on a value for money basis.

Finally, the level of Council support and commitment will play a pivotal role in prioritising proposals, phasing and funding.

Project dependencies

Project dependencies arise where the delivery of masterplan proposals is affected in some way by other projects or factors:

- Ability to attract funding is a key dependency in that it will govern which proposals can proceed and when. Similarly commitment of key stakeholders politically and operationally, as well as financially, will influence when some proposals might be delivered.
- Outcome of the OIITS Study and the future provision and requirements of internal ferry vessels will have a key influence on masterplan proposals relating to ferry infrastructure.
- Proposals at Hatston may be influenced by the terms of the new Northern Isles ferry services contract – there may be a new operator in place and there could be changes to timetables for external ferries.
- The expansion of the marina at Kirkwall Pier is dependent on being able to remove ferry vessels from the east basin – thus it is dependent on the construction of new quayside to the north.
- Developments and projects within specific sectors may influence some proposals in how and when they are developed – particularly oil and gas, aquaculture, fishing, renewables and boat repair and maintenance.

Integration with the planning and policy framework

From a policy perspective it is envisaged that the Harbour Authority will work closer with Government bodies to ensure that the masterplan is aligned with planning and policy developments, which might lead to funding opportunities through the Scottish Government.

Partnerships and engagement

Ongoing dialogue and engagement with stakeholders is fundamental in ensuring that the masterplan proposals are fit for purpose and meet the needs of existing and future users.

The purpose of engaging with stakeholders is:

- To ensure that they are aware of what is happening in terms of development and the potential impacts.
- To maintain buy-in for masterplan proposals – as these can be developed over a long period of time.
- To obtain information and views on particular projects which can be used to refine proposals and processes.

There has already been substantial engagement with harbour users and local stakeholders throughout the development of the masterplan.

A stakeholder engagement plan will be developed, setting out which stakeholders need to be engaged at what point in the process of delivering each of the masterplan proposals.

A summary of key stakeholders is presented opposite.

Key stakeholders

- Orkney Islands Council.
- OIC Marine Services.
- All harbour users, including aquaculture companies, ferry operators, cargo/shipping/haulage companies, fishing boats, cruise, marina operators and users, renewable energy developers, marine leisure users, users of the existing fish/shellfish facilities, businesses based in the Harbour Estate or using facilities there.
- Potential new users/customers.
- Industry associations and representative bodies.
- Local community through Community Councils and other key local groups.
- HIE.
- Scottish Government.
- UK Government (Department for Transport, Maritime & Coastguard Agency).
- Crown Estate.
- Marine Scotland.
- Transport Scotland.
- Environmental authorities (e.g. SNH, HES, SEPA, Scottish Water).

Funding

There will likely be a range of possible funding sources that will need to be explored:

- Harbour Authority own funds and ability to borrow money.
- Orkney Islands Council through various departments and possible contribution from the Strategic Reserve (formerly the Harbours Fund) in particular.
- HIE.
- Scottish Government.
- Private sector entities.
- Developer contributions.
- If funding is sourced from outside of Orkney, there may be some merit in considering mechanisms developed by the Scottish Futures Trust (SFT).

Implementation

Following publication of the final masterplan, the Harbour Authority will progress implementation of the masterplan proposals. This may comprise the following steps:

- Completion of an Outline Business Case which clearly sets out the financial and economic impacts associated with each proposal, as well as what the funding gaps might be.
- Development of a detailed implementation plan and governance strategy, outlining what the project management arrangements will be for the planning and delivery of proposals. A key element of this will be the succession strategy with regard to Harbour Authority management.
- Preparation of feasibility studies.
- Dialogue with potential funders.
- Ongoing engagement with key stakeholders.

APPENDIX A – HARBOUR AREAS, PORT PREMISES & PERMITTED DEVELOPMENT

Definition of harbour area and port premises

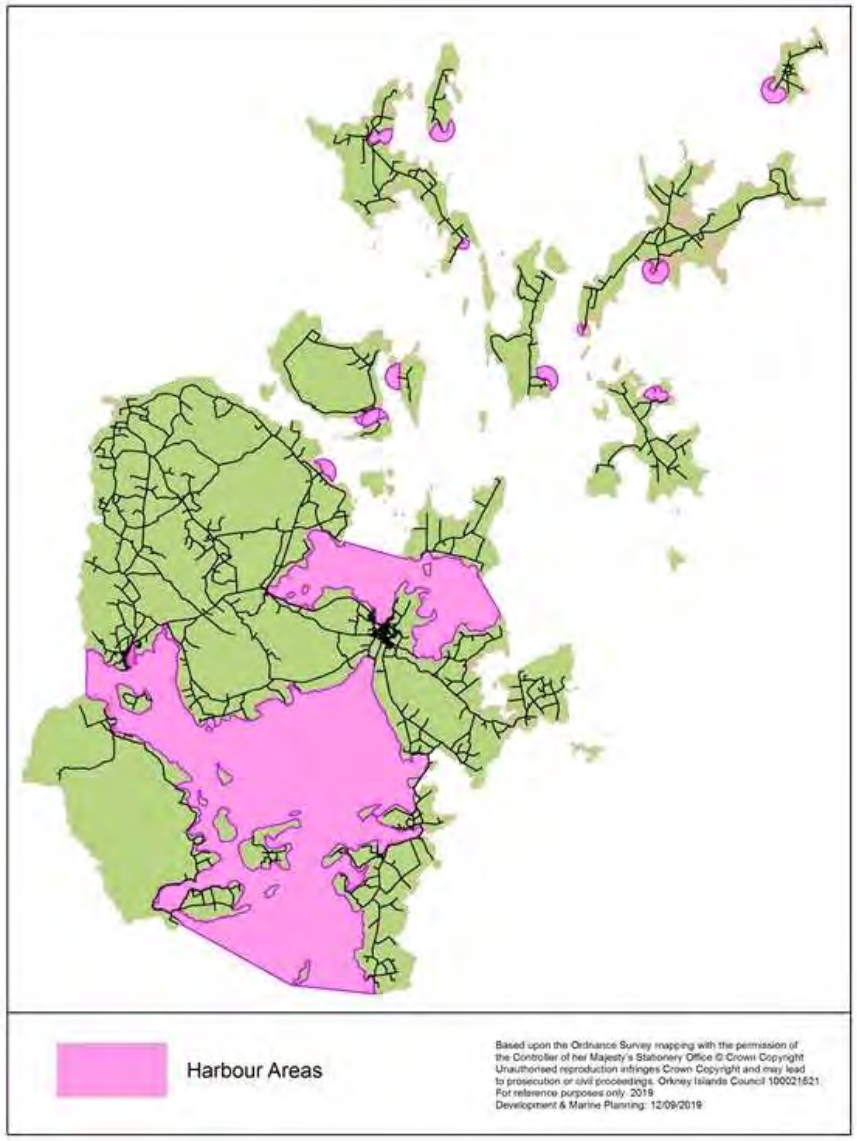
The Orkney County Council Act 1974 section 7 confers powers on the Council to construct harbour related works in harbour areas. The expression "harbour area" is defined in section 3 of the 1974 Act (as amended by section 3(1) of the 1978 Act) and that amended definition provides as follows:

""harbour area" means the areas the respective limits of which are described in the Schedule to this Act and includes port premises adjacent to any of those areas;".

The harbour areas are listed in the Schedule to the 1974 Act as amended by the addition of the further harbour areas referred to in section 3(2) of the 1978 Act and article 2 of the 1989 Harbour Revision Order. These harbour areas include Scapa Flow, Wide Firth, Shapinsay Sound and areas in proximity to North Isles piers as detailed on the map opposite.

Subsequent maps in this section delineate the extent of land owned or operated by the Orkney Harbour Authority at the time of publishing this masterplan in 2019. These maps identify the extent of adjacent port premises at Hatston Terminal, Kirkwall Pier, Scapa Pier, New Pier (Stromness), North Pier (Stromness) and Copland's Dock. These adjacent port premises form part of the harbour area as defined in the 1974 Act (as amended).

Map of harbour areas



Permitted development and operational land

The Council has the benefit of the planning permissions granted by paragraph (1)(a) of Town and Country Planning (General Permitted Development) (Scotland) Order 1992 Class 29 for each of the harbour areas and can carry out any of the harbour related works specified in section 7 of the 1974 Act (i.e. "*such works as are required for or in connection with the exercise by the Council of their functions under this Act").* Under the condition set out in paragraph (2) of Class 29, development is not permitted for the buildings and road accesses specified in that paragraph unless the prior approval of the Council, as planning authority, in respect of the relevant detailed plans and specifications is first obtained. It should be noted that a Class 29 development does not require an Environmental Impact Assessment.

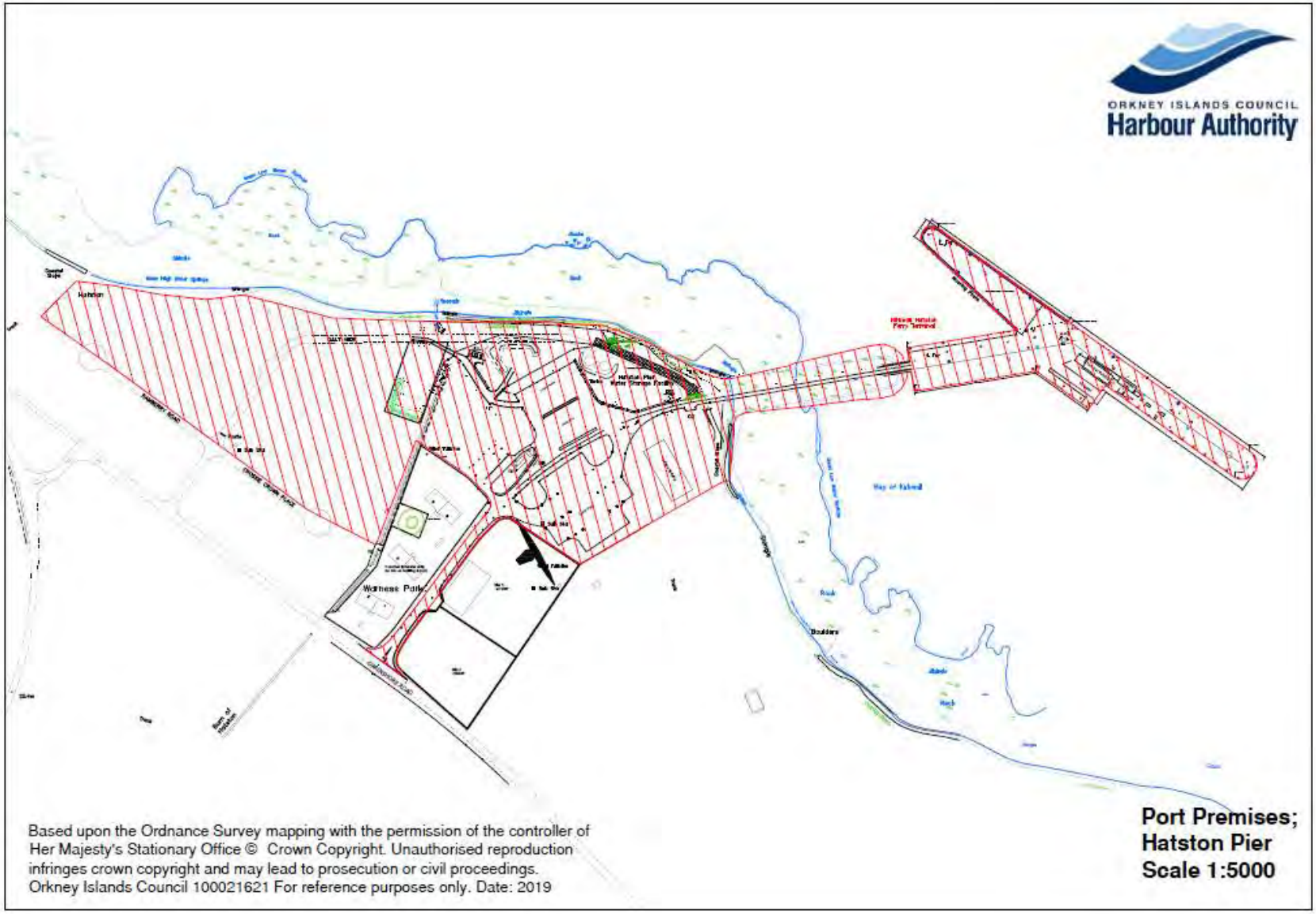
For the purposes of planning permissions granted by Class 29 paragraph (1)(a), the harbour areas include the respective limits described in the Schedule of the 1974 Act (as amended) and the port premises adjacent to those areas.

The Council or their lessees have the benefit of the planning permissions granted by paragraph (1) of Town and Country Planning (General Permitted Development) (Scotland) Order 1992 Class 35 for the developments specified in that paragraph but only on operational land as defined in sections 215 and 216 of the Town and Country Planning (Scotland) Act 1997; and as further defined by the second limb of paragraph (3) of Class 35. Developments referred to in paragraph (1) of Class 35 are restricted by paragraphs (2) and (3) of Class 35. It should be noted that a planning permission is not available under Class 35 where an Environmental Impact Assessment is required.

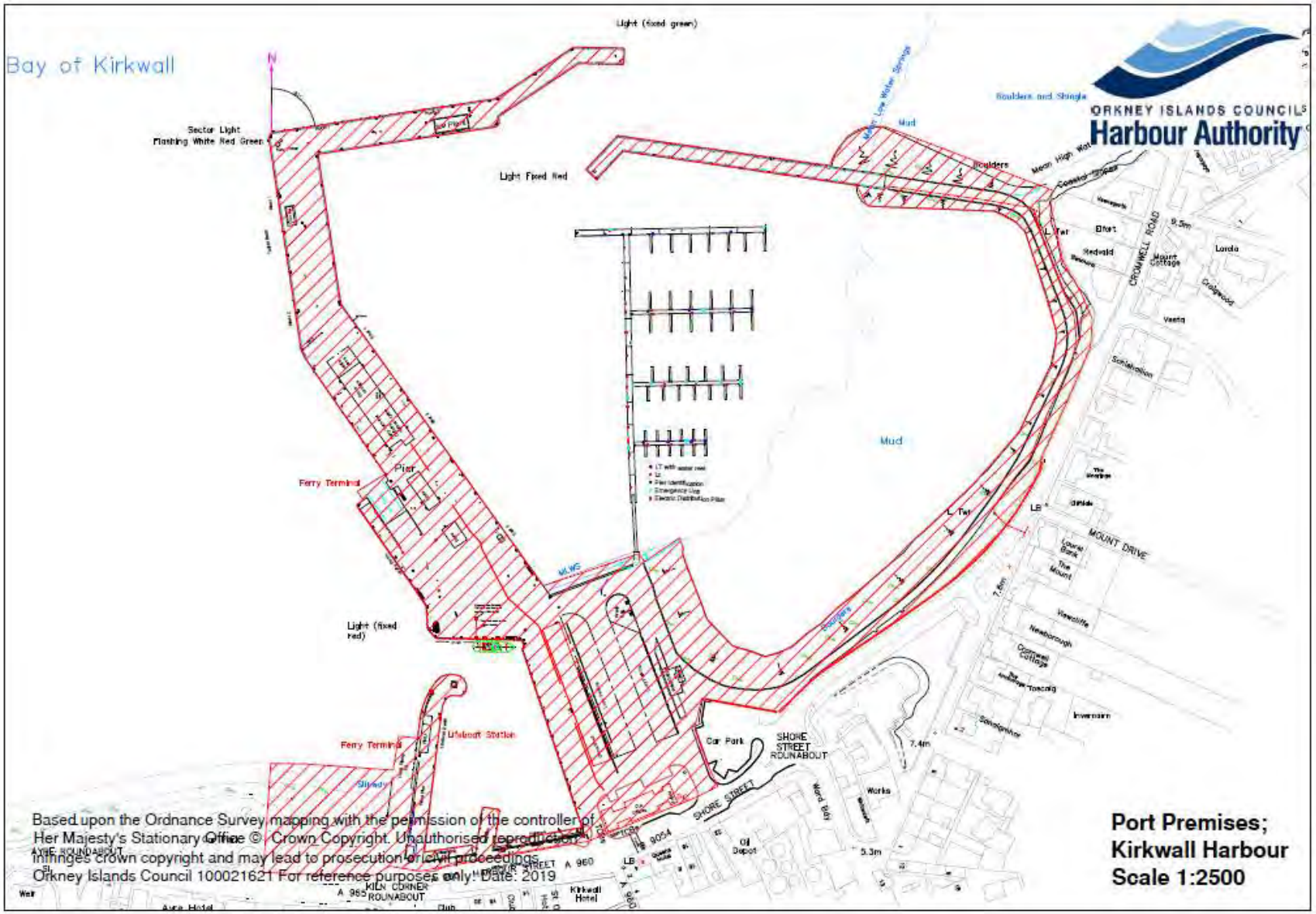
Port premises relating to the harbours specified in the Schedule to the 1974 Act and Schedule 1 to the 1978 Act which was harbour land owned by the Council's statutory predecessors before 8 December 1969 had and has continuing status "operational land" under section 216(1) of the 1997 Act. Furthermore, reference to "Specific planning permission" under section 216(3) of the 1997 Act includes permission granted by Part 11, Class 29 of the GPDO by virtue of section 216(5)(b) and (6)(b)(i).

The extent of operational land will be identified as part of the masterplan Outline Business Case and associated Implementation Plan to clarify the future consenting requirements for the masterplan proposals.

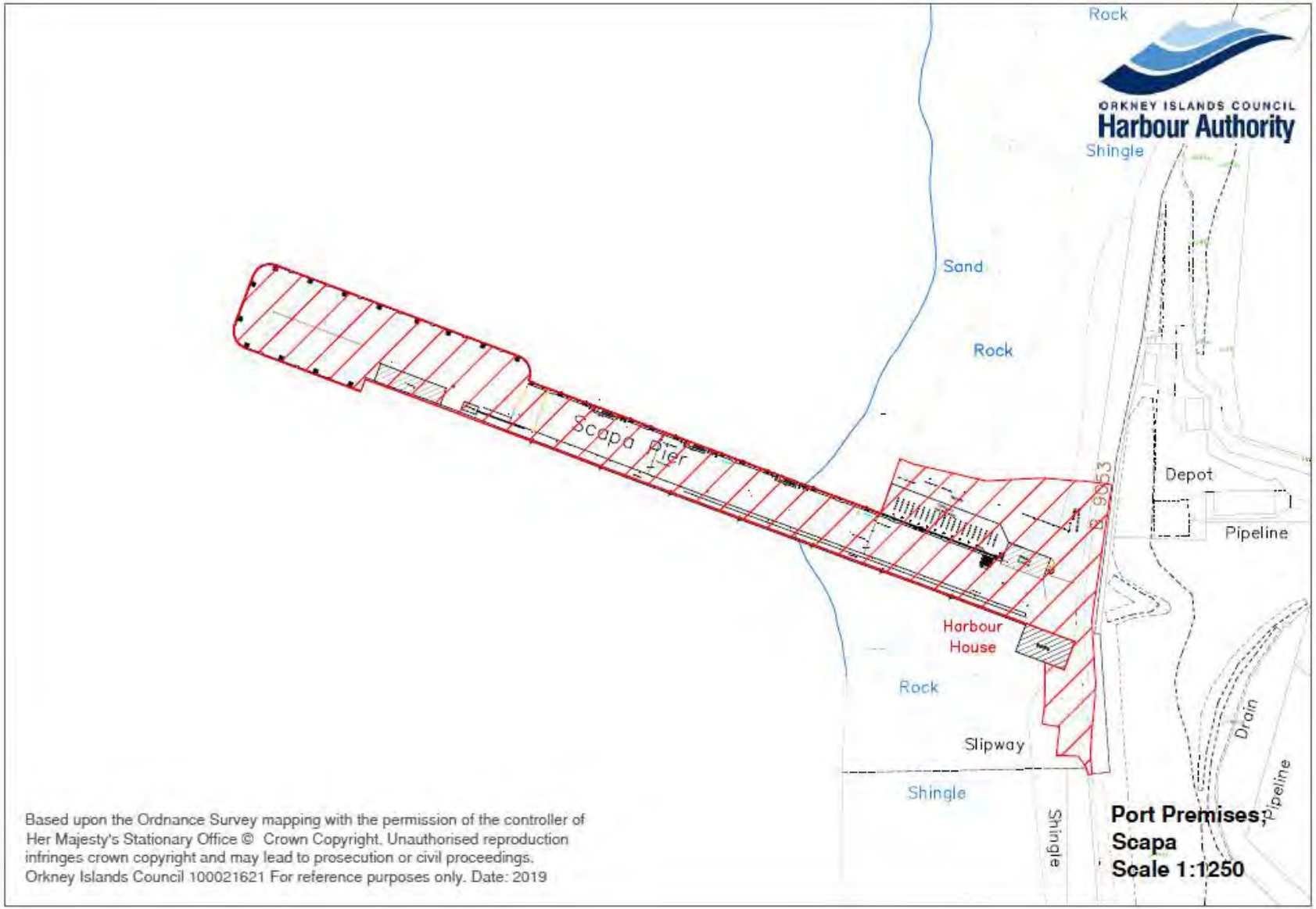
Port premises at Hatston Pier and Terminal



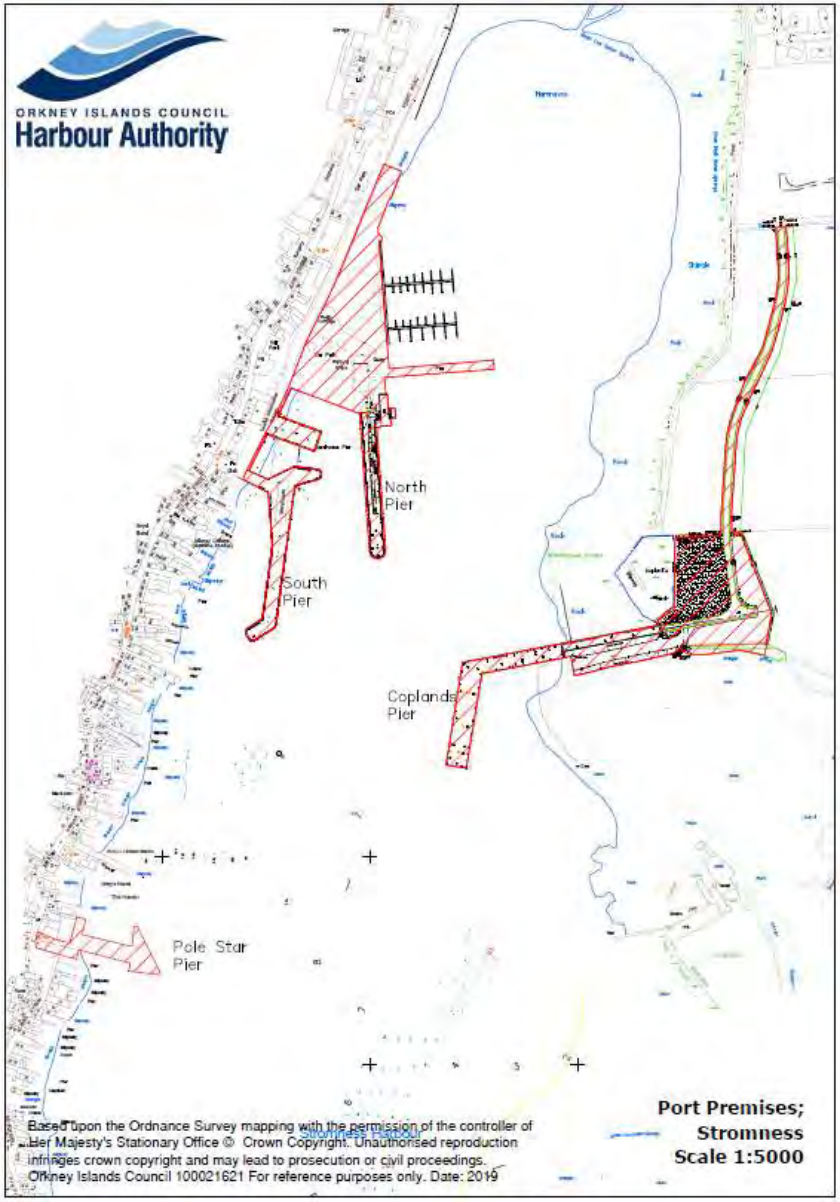
Port premises at Kirkwall Pier



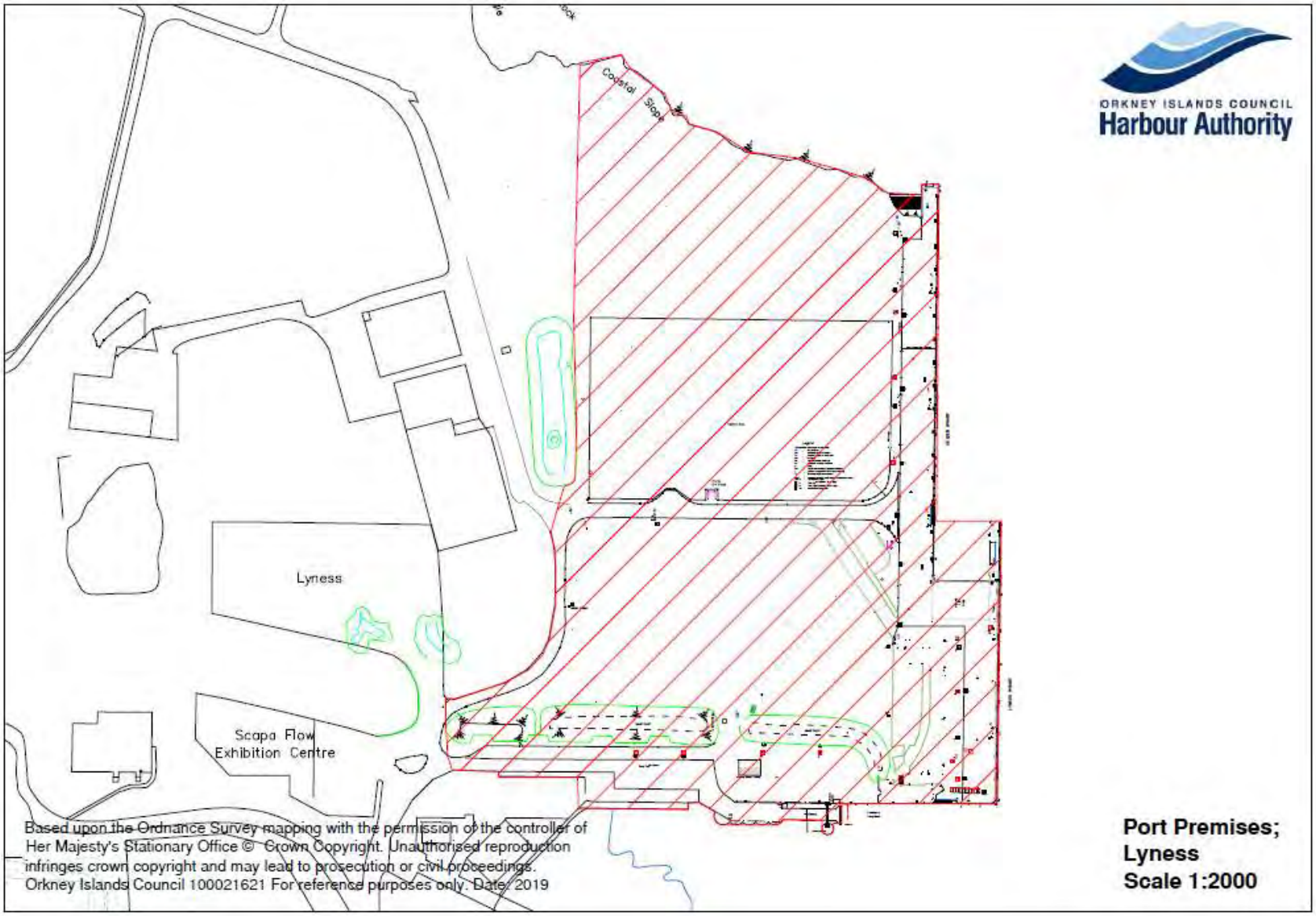
Port premises at Scapa Pier



Port premises at Stromness and Copland's Dock



Port premises at Lyness



APPENDIX B – PROPOSED DEVELOPMENT POLICY PRINCIPLES

Proposed Development Policy Principles: Safeguarding harbour operations in Scapa Flow

Proposed Development Policy Principle 1: Safeguarding strategic importance of Scapa Flow coastal areas

- No marine or coastal development and/or activities should have a significant adverse impact on Harbour Area operations and/or navigational safety on the east coast of Scapa Flow from Scapa Beach to St Mary's within a buffer zone of 1,500m from the shore. The purpose of this is to safeguard any future proposals to build deep water harbour infrastructure, or any other strategically important harbour infrastructure, along this coastline and allow for safe navigation and manoeuvrability.
- The north coast of Scapa Flow stretching from Scapa Beach to Stromness is regarded as a strategically important area for potential future harbour development and could be subject to new harbour infrastructure in the longer term.

Proposed Development Policy Principle 2: Safeguarding strategic navigational channels for all vessels entering and exiting Scapa Flow

No marine or coastal development and/or activities should have a significant adverse impact on the following recognised navigation channels:

- All ferry navigational routes in Scapa Flow.
- Navigational routes for tankers and other large vessels.
- Channels/approaches associated with Flotta and Lyness.

Similarly no marine or coastal development and/or activities should have a significant adverse impact on safe passage through any sound (e.g. West Weddel Sound, Switha Sound, Gutter Sound), including Widewall Bay which acts as a safe escape route for large tankers.

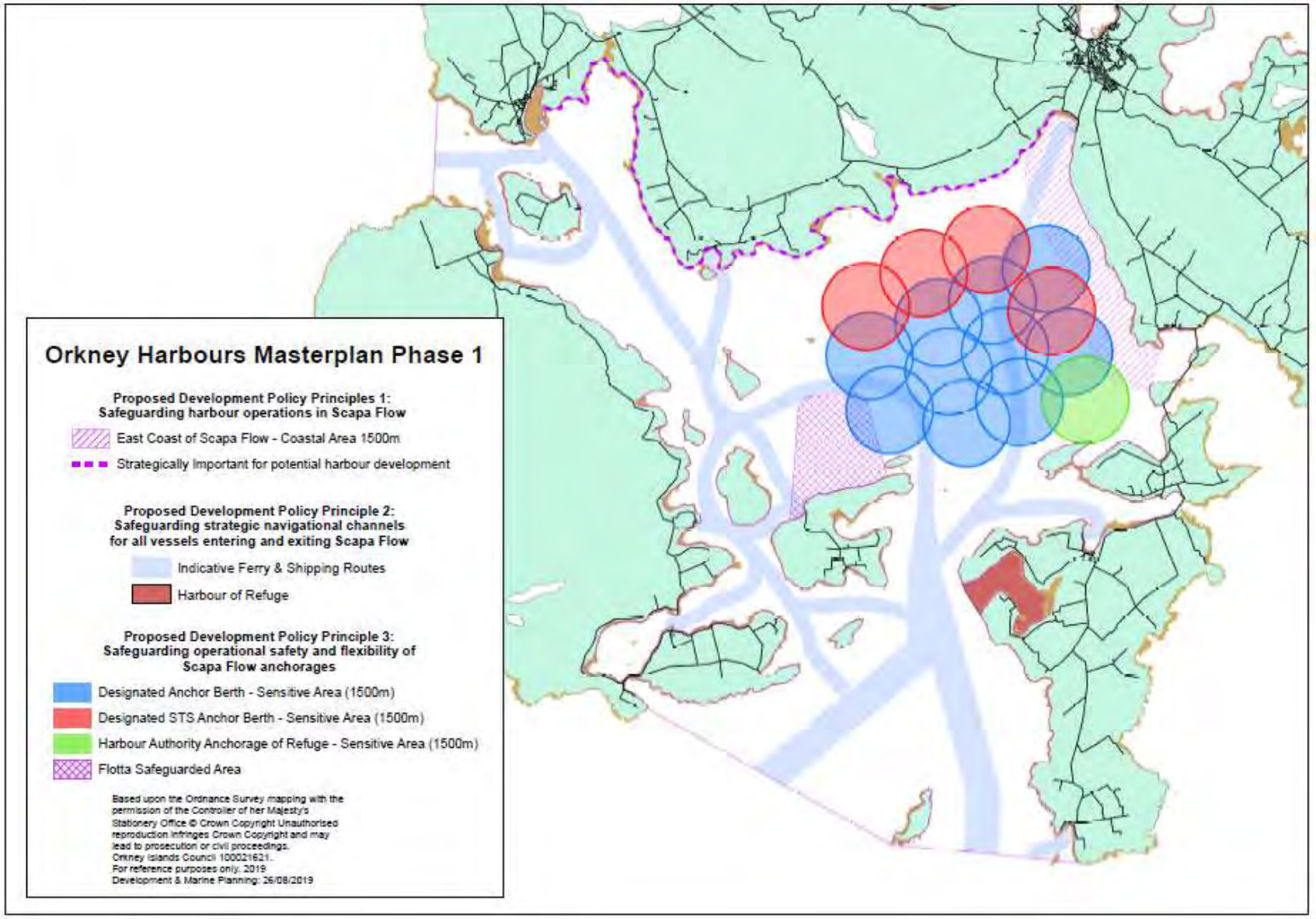
Proposed Development Policy Principle 3: Safeguarding operational safety and flexibility of Scapa Flow anchorages

Based on operational evidence, it is the view of the Harbour Authority that the Aquaculture Supplementary Guidance 1,000m area of sensitivity associated with STS berths and the other designated anchor berths in Scapa Flow is insufficient, for the following reasons:

- If weather changes once a vessel is in position (at for example STS 4), then it can be the case that the vessel is within only 400m of potential fish farm cages located at the 1,000m point.
- Anchor dragging.

A 1,500m area of sensitivity associated with STS berths and the other designated anchor berths is therefore proposed by the Harbour Authority. The operational area to the north of Flotta Oil Terminal should be safeguarded for harbour operations.

Proposed Development Policy Principles: Safeguarding harbour operations in Scapa Flow



APPENDIX C – POLICY CONTEXT

Scotland's Economic Strategy

The Scottish Government's purpose is to create a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth. The Strategy focusses on two pillars to achieve this objective: increasing competitiveness and tackling inequality.

This is underpinned by four priorities for sustainable growth: **investment, innovation, inclusive growth and internationalisation.**

Infrastructure Investment Plan 2015

The Infrastructure Investment Plan sets out priorities for investment and a long-term strategy for the development of public infrastructure in Scotland.

The Plan states that "action is being taken across Government programmes to empower our island communities and, recognising the important role infrastructure plays in realising our islands potential, we will prioritise relevant transport, energy and digital investment."

There is scope for the masterplan outputs to inform the next version of the Plan.

National Planning Framework 3 (4)

This framework sets out a long-term vision for development and investment across Scotland for the next 20 to 30 years.

Hatston and Lyness are identified as 'enterprise areas' and as additional National Renewables Infrastructure Plan (NRIP) sites, whilst Kirkwall is recognised as an 'island hub for investment'.

Pentland Firth and Orkney Waters are earmarked as one of four 'energy hubs' in Scotland.

Scapa Flow is highlighted as one of five key ports in Scotland, on the basis that there could be opportunities arising from the opening up of new shipping routes across the Arctic.

There is scope for the masterplan outputs to inform the next version of the Framework (National Planning Framework 4), in particular to secure a major infrastructure project of national significance.

National Transport Strategy (NTS)

The NTS provides the framework for enhancing Scotland's transport system, in response to the main transport challenges that Scotland faces, which in turn contributes to improvement in its economic, environmental and social performance. There are three key strategic outcomes: tackling congestion and lack of integration; reducing emissions and improving the quality, accessibility and affordability of public transport.

The NTS is due to be refreshed in 2019 – there is scope for the masterplan outputs to inform the next version of the NTS.

Scotland's National Marine Plan

This plan sets out strategic policies for the sustainable development of Scotland's marine resources out to 200 nautical miles.

The key aim of this plan is:

"Achieving a sustainable economy, promoting good governance and using sound science responsibly are essential to the creation and maintenance of a strong, healthy and just society capable of living within environmental limits."

There are 21 General Policies (see opposite) which are considered necessary to achieve sustainable development and use. Through the appropriate consenting processes the masterplan proposals will pay due regard to these General Policies of the National Marine Plan.

National Marine Plan – General Policies

GEN 1 General planning principle
GEN 2 Economic benefit
GEN 3 Social benefit
GEN 4 Co-existence
GEN 5 Climate change
GEN 6 Historic environment
GEN 7 Landscape/seascape
GEN 8 Coastal processes and flooding
GEN 9 Natural heritage
GEN 10 Invasive non-native species
GEN 11 Marine litter
GEN 12 Water quality and resource
GEN 13 Noise
GEN 14 Air quality
GEN 15 Planning alignment A: (sea/shore access)
GEN 16 Planning alignment B: (inshore water only)
GEN 17 Fairness
GEN 18 Engagement
GEN 19 Sound evidence
GEN 20 Adaptive management
GEN 21 Cumulative impacts

Ferries Plan (2013 – 2022) and related studies

The Ferries Plan aims to maximise the economic and social potential of Scotland's remote rural and island communities. Its intention is provide a clear view of the way forward for lifeline ferry services in Scotland, addressing issues of funding, fares, accessibility, responsibility and the environment. With reference to the internal ferry services in Orkney and Shetland, the Plan states that there would be discussions with the relevant local authorities to determine the future running of such ferry services. Negotiations with Transport Scotland are currently underway, which may result in the inter-isle ferry services being operated in-house by the Scottish Government.

Following an Appraisal of Options for the Specification of the Northern Isles Ferry Services (NIFS) in 2017 the tender process is now underway to select an operator for these external ferry services. The contract covers ferry services between the Scottish mainland and the Northern Isles of Orkney and Shetland to transport passengers, vehicles and freight.

The full specification for these services will be made available to bidders during the tendering process. The contract is due to commence in October 2019 and run for a maximum of eight years.

A revised Ferries Plan is due to be published in 2022.

Scottish Climate Change Adaption Programme

A five-year Climate Change Adaptation Programme for Scotland (2019 – 2024) is in the process of being developed. This new Adaptation Programme will build on progress made under the 2009 Adaptation Framework and will take account of more recent Climate Change Risk Assessments.

The Programme must set out progress on the previous Programme, Scottish Ministers' objectives on adaptation, proposals and policies and their timescales, and arrangements for wider engagement.

The Programme comprises seven high level outcomes:

- Our communities are inclusive, empowered, resilient and safe in response to the changing climate.
- The people in Scotland who are most vulnerable to climate change are able to adapt and climate justice is embedded in climate change adaptation policy.
- Our inclusive and sustainable economy is flexible, adaptable and responsive to the changing climate.
- Our society's supporting systems are resilient to climate change.
- Our natural environment is valued, enjoyed, protected and enhanced and has increased resilience to climate change.
- Our coastal and marine environment is valued, enjoyed, protected and enhanced and has increased resilience to climate change.
- Our international networks are adaptable to climate change.

Climate Change (Scotland) Bill 2009 amendments

A new Climate Change Bill was introduced to Parliament on 23 May 2018, amending the Climate Change (Scotland) Act 2009.

In line with advice from the Committee on Climate Change (CCC) on 2 May 2019, amendments to the Bill were lodged, to set a target date of 2045 for reaching net-zero emissions. The amendments to the Bill also raised the ambition of the 2030 and 2040 targets to 70% and 90% emissions reductions respectively. The Scottish Parliament's Environment Committee voted in favour of these targets at Stage 2 on 18 June 2019.

'Net-zero' is when emissions of greenhouse gases to the atmosphere are balanced by removals of those gases (such as carbon being absorbed by forests). This is equivalent to a 100% reduction in net emissions from baseline levels.

Scotland's headline targets are based on reducing emissions across all the greenhouse gases covered by the Kyoto Protocol. This means carbon dioxide, but also methane and other gases.

(Source: www.climate.scot)

Marine Tourism Strategy

The vision of Scotland's Marine Tourism sector strategic framework, "Awakening the Giant" is: "By 2020 we want Scotland to be "a marine tourism destination of first choice for high quality, value for money and memorable customer experience delivered by skilled and passionate people."

The strategy seeks to increase visitor expenditure from sailing tourism from £101m in 2010 to £145m by 2020 and to increase the overall economic value of the sector to over £450m by 2020.

National Islands Plan

The proposed Plan, published in October 2019, provides a framework for action intended to improve outcomes for island communities. It includes proposals relating to a set of 13 strategic objectives and has been informed by legislation and talking to stakeholders across the islands. Of particular relevance are Strategic Objectives 2 and 3 concerning economic development and transport:

To improve and promote sustainable economic development	• Promote a thriving business environment that allows individuals to pursue a wide range of economic opportunities on islands. • Build on Scotland's National Marine Plan to ensure that fishing and other economic activities stemming from the sea provide increased opportunities for island communities. • Work in partnership with UHI, HIE and others to support strategic projects which deliver sustainable economic growth in the islands.
To improve transport services	• Ensure that existing and future transport-related policies, strategies and services are fully island proofed so that they truly meet the needs of island communities. • Produce a long-term plan and investment programme for new ferries and development at ports to improve resilience, reliability, capacity and reduce emissions.

HIE Operating Plan

HIE's Operating Plan (2018-2019) sets out HIE's purpose, vision and priorities and the actions required to build the region's future.

- Accelerating Business Growth: supporting businesses to grow through investment, innovation and internationalisation.
- Strengthening Communities: enabling communities, particularly in remote and rural areas, to make a significant contribution to place-based development.
- Supporting Growth Sectors: sectoral development with a focus on sub-sectors and supply chains offering distinctive regional opportunities.
- Developing Regional Attractiveness: making the Highlands and Islands a globally-attractive region in which to live, work, study and invest.

HITRANS Regional Transport Strategy (RTS)

The RTS vision is to deliver connectivity across the region which enables sustainable economic growth and helps communities to actively participate in economic and social activities. To achieve these high level objectives, there are four transport objectives:

- Reduce journey times and improve reliability and resilience.
- Improve safety of transport and travel.
- Tackle capacity constraints.
- Improve quality, accessibility and integration of travel.

Pentland Firth and Orkney Waters Spatial Plan

The Plan sets out an integrated planning policy framework to guide marine development, activities and management decisions, whilst ensuring the quality of the marine environment is protected. The vision is as follows:

"Pentland Firth and Orkney Waters will be a clean, healthy, safe, attractive and productive marine and coastal environment that is rich in biodiversity and managed sustainably to support thriving and resilient local communities."

Orkney Council Plan (2018 – 2023)

The Council Plan sets out the key priorities of Orkney Islands Council and details the projects and activities through which these priorities are to be implemented, within agreed budget.

The Plan's mission is focused on 'working together for a better Orkney'. There are five strategic priorities and a number of key priorities and aspirations which the masterplan proposals could potentially deliver against (see opposite).

Orkney Community Plan (2017 – 2020)

The Orkney Community Plan incorporates Orkney's Local Outcomes Improvement Plan (LOIP) and describes what the Orkney Partnership (this is a partnership between OIC and other stakeholder organisations) aims to achieve, setting out its strategic priorities for action. There are three strategic priorities:

- Positive ageing – independent living; positive and valued participation in the community; long-term health and wellbeing.
- A vibrant economic environment – opportunities for young people; Orkney innovation zone; community-based enterprise and employment.
- Healthy and sustainable communities – healthy lifestyles; inclusiveness and equality; access; a sustainable health and care workforce.

Relevant priorities and aspirations (Council Plan)

Strategic Priority	Priorities/aspirations of relevance
Connected Communities	• Invest in marine infrastructure and business development.
Caring Communities	• Address workforce development to make sure we have the right people in the right place at the right time.
Thriving Communities	• The Orkney Community is able to access work, learning and leisure through a modern, robust infrastructure which supports all our communities and meets the requirements of 21st century life.
Enterprising Communities	• Continue to develop strategic projects, particularly to capitalise on the renewables sector. • Progress the Islands Deal to deliver innovative, enterprising and transformational projects. • Continue to encourage and support economic opportunities which maximise islands' opportunity and influence.
Quality of Life	• Orkney has a flourishing population with people of all ages choosing to stay, return or relocate here for a better quality of life.

Orkney's Local Development Plan (LDP) 2017

OIC adopted a new Local Development Plan (LDP) for Orkney in April 2017. It sets out a vision and spatial strategy for the development of land in Orkney over the next 10 to 20 years.

The plan sets out 15 policies for each type of development. All of the policies in the Plan are afforded equal weight in the determination of planning applications; if a proposal is contrary to any single policy then it does not accord with the Plan.

There are several supplementary guidance documents for specific planning issues and sectors.

The Plan's vision incorporates the following:

- To ensure that effective planning policies are in place to strengthen and support Orkney's communities by enabling those developments which will have a positive and sustainable socio-economic impact, and utilise locally-available resources, whilst striving to preserve and enhance the rich natural and cultural heritage assets upon which Orkney's economy and society depends.
- Orkney's settlements will act as a focus for growth in order to support existing facilities and services such as shops, schools and public transport links. Facilitating active travel will be an integral part of development planning across the county with a commitment to include well-integrated footpaths and cycleways within new developments and to connect any fragmented sections of the existing network to encourage active and healthy living.
- The Plan supports Orkney's strong maritime links and guides relevant developments to key land around ports and harbours.

Orkney Regional Marine Plan

The Marine (Scotland) Act 2010 introduced a provision for local stakeholders to prepare statutory regional marine plans at the local level. A regional marine plan is the marine equivalent of a local development plan, containing statutory local policies and spatial plans to guide marine consenting and management decisions.

Regional marine plans are prepared by Marine Planning Partnerships (MPPs) representing the economic, community, environmental and recreational interests within a local marine region. MPPs are established to enable local ownership of policy development and decision making taking account of local circumstances.

OIC is currently leading the development of the Orkney Islands Marine Planning Partnership with the aim of establishing the partnership in 2020.

Kirkwall Urban Design Framework

The Urban Design Framework (UDF) sets out land use planning policy and development land allocations for Kirkwall.

A number of planning and design principles are focussed on enhancing Kirkwall's sense of place, improving connectivity within the town, visual amenity and public realm aspects. There is also a principle to create a robust landscape framework for the future development of Hatston industrial area, a coastal pathway linking the town centre to Hatston, a proposed Harbour Re-purposing Zone at Kirkwall Marina and developments in other areas around Kirkwall.

Draft Orkney Tourism Strategy 2019 – 2025

A draft Orkney Tourism Strategy is being developed by the Destination Orkney Strategic Partnership; its vision for 2025 is:

Orkney will be the natural choice for discerning visitors seeking a world class experience on this unique archipelago which offers rare archaeological discoveries in a pristine, tranquil and welcoming setting.'

Marine tourism is one of four identified authentic experiences: this broad theme includes leisure sailing, windsurfing and other uses of the marine environment. It also includes cruise ship travel, with Orkney now being one of the most successful cruise ports in the UK and Europe. The strategy highlights the impact of cruise on local services and the conflict between day and staying visitors – these aspects are considered within a Destination Management Plan which is being developed.

Orkney Sustainable Energy Strategy

In 2009 the community in Orkney published the Sustainable Orkney Energy Strategy which sought to define three overarching aims to bring a strategic direction to its energy ambitions. These three aims sought to:

- Ensure Orkney uses energy as efficiently as possible and has a secure and affordable energy supply to meet its future needs.
- Add value to Orkney's renewable energy resources, for the benefit of the local economy and local communities, whilst minimising damage to the environment.
- Reduce Orkney's carbon footprint.

In 2017, this was superseded by the Orkney Sustainable Energy Strategy. The vision statement of this strategy was:

'Orkney: a secure, sustainable low carbon island economy driven uniquely by innovation and collaboration, enabling the community to achieve ambitious carbon reduction targets, address fuel poverty and provide energy systems solutions to the world.'

This vision was supported by the following thematic pillars:

1. Maximising local value and efficiency (from local resources).
2. Smart, Low Carbon Transport and Heat.
3. A secure transition to renewable and carbon energy systems.
4. Smart, Supportive Infrastructure Investment.
5. Influencing and developing policy and access to energy markets.

Orkney Hydrogen Strategy

The Orkney Hydrogen Strategy: The Hydrogen Islands seeks to identify how hydrogen can best be applied to Orkney in developing local energy systems to maintain the early mover advantage, fulfil wider strategic goals set by the governments in Scotland and UK and how solutions developed in Orkney can be applied to other communities facing energy challenges of their own as we transition to a low carbon society.

This strategy seeks to encourage a wide range of hydrogen end-users to aid development of the associated economy and create conditions conducive to adopting hydrogen technologies while investment opportunities are available. There are five hydrogen development themes within the strategy.

Hydrogen is fast becoming a key energy resource in the world transition to a low carbon future. The Orkney Hydrogen Strategy seeks to aid development towards an Orkney appropriate sustainable hydrogen economy to provide economic benefits such as: local jobs; establishing a local supply chain; and an increased resilience in the local energy system. Orkney will maintain its leading edge on the development of local energy systems that make use of a range of renewable technologies, develop local hydrogen economies and increase the efficacy of local grid infrastructure to better meet the needs of the local population. This strategy should seek to attract further inward investment to build on hydrogen technology deployments where appropriate.

APPENDIX D – SUMMARY OF ECONOMIC BENEFITS

Kirkwall Pier proposals – who will benefit and potential impacts

New multi-purpose quayside infrastructure	**Ferry operator and users** Benefit from having dedicated, sheltered overnight berths. Provision of additional berths will safeguard future provision of lifeline internal ferry services.	• Increase efficiency and safety for ferry operator. • Increase number of larger vessels using new infrastructure. • Increase volume of smaller vessels using east basin. • Increase number of cruise passengers and spend. • Increase efficiency and safety for vessel owners, potentially leading to higher productivity, cost savings, etc. • Increase number of resident marina berths taken/visiting yachts and associated spend on goods and services. • Safeguard/create employment in marine leisure supply chain. • Increase financial sustainability of Harbour Authority through additional income. • Increase efficiency of Kirkwall Pier.
	Other vessel owners (cruise, aquaculture, cargo, fishing) Vessels with larger drafts able to use Kirkwall Pier. Larger cruise liners can come alongside rather than tender in, as some slots at Hatston will be freed up by more small vessels using Kirkwall. Improved experience for cruise passengers at Kirkwall. More space in the east basin for smaller boats alongside. Less operational conflict on quayside as more quayside available. More pier and berth space for aquaculture vessels.	
	Marina users Marina can only be expanded if ferries are relocated away from east basin.	
Marina expansion	**Resident and visiting marina users** Additional berthing capacity for local people who wish to take up a resident berth and visiting boats, including larger yachts.	• Increase take up of resident and visitor berths. • Increase spend on local goods, services and marine supply chain – this leads to an increase in supply chain capabilities and provision, turnover and employment. • Make Orkney more attractive as a marine leisure destination/over wintering location. • Increase financial sustainability of Orkney Marinas through additional income.
	Local businesses Increase in customer base (e.g. marina users) which may lead to expansion within marine supply chain or other sectors (e.g. retail, food, etc.).	
	Tourism sector in Orkney Enhance overall marine leisure market in Orkney.	
	Orkney Marinas Increase utilisation of berths.	

Kirkwall Pier proposals – who will benefit and potential impacts

Waterfront development	**Local businesses** Stimulate business development, enabling local businesses to create new business units (e.g. retail, café, chandlery).	• Increase business turnover and employment, plus potential increase in the number of businesses. • Improve visual amenity and improve quality of life for local community, supporting population retention and growth. • Increase visitor spend and encourage return visits. • Increase well-being and health. • Increase financial sustainability of Harbour Authority through additional income (e.g. lease/sale of land/business units). • Increase efficiency of Kirkwall Pier.
	Residents Improve experience in terms of visual amenity/sense of place. More choice of where to spend money. More employment opportunities for residents.	
	Visitors Marina visitors will benefit from improved services/facilities. Area will be more attractive for visitors. More choice of where to spend money.	
	Local groups (e.g. sailing, etc.) Improve facilities, making groups more sustainable and attractive.	
Improvements to fish landing areas	**Fishing boat owners/operators** Additional berths and improved access arrangement available to land fish and transport it from the Pier.	• Increase efficiency and safety for fishing vessel owners.
Improving quayside layout and traffic management	**Harbour users, pedestrians, ferry passengers and freight** All will benefit from improved buildings and facilities located in more appropriate locations, a safer and less congested quayside, improved marshalling areas. Incorporate development opportunities as part of facility enhancements.	• Increase efficiency and safety for all. • Improve connectivity and accessibility for ferry users. • Potentially increase economic activity if opportunities arise through improvements to facilities/buildings.

Kirkwall Pier – key assumptions

Marina expansion

- Marina will double in size with an additional 95 berths.
- 65 berths will be for residents and 30 for visitors.
- Flexibility for visitors to use unoccupied resident berths for short stays, though this is not included in the analysis.

Cruise

- The additional depth and quayside at Kirkwall will enable greater flexibility in terms of meeting unmet demand in the cruise market.
- In particular, if Kirkwall can accommodate small cruise ships that currently go to Hatston (on the 'first come first served' policy), then Hatston could accommodate some of the medium/larger cruise ships that decide not to visit because they do not want to/cannot tender passengers in from anchor.
- Modest increase in the number of smaller cruise ship calls, though potential upside not included in analysis.

Waterfront development area

- Area of 2.75 hectares will be created through reclamation.
- Could be for wide range of uses – marina facilities, more general marine leisure facilities, retail, tourism, transport, etc.

Kirkwall Pier – high level results

Project cost	£34.118m
NPV	-£1.3m
Financial IRR	-£8.6m
Employment (direct + indirect & induced) in 2050	46
GVA in 2050	£1.2m

Hatston proposals – who will benefit and potential impacts

New multi-purpose quayside infrastructure and available land	**Oil and gas operators/vessel owners** Sufficient availability of berths, laydown area and ex-pipe fuelling to attract oil and gas supply vessels servicing West of Shetland assets – offers the sector more choice in terms of supply base locations. **Local businesses and residents** Increase business opportunities for existing/new businesses in supply chain (e.g. to enter new markets/diversity, etc.). Employment, training and upskilling opportunities.	• Cost savings for oil and gas companies. • Increase turnover in supply chain, alongside potential business creation and increase in skills base. • Increase employment, population and skill levels/qualification take up. • Increase financial sustainability of Harbour Authority through additional income.
Site for boatyard repair and maintenance facility	**Existing boatyard operator/new boatyard operator** Either expansion or new business opportunity for boat repair and maintenance operator. **Local businesses** Increase in demand for supply chain to support boatyard operation. **Boat owners** Fishing, aquaculture and other work boats will be able to have their vessels handled in Orkney, rather than steaming to North East Scotland. **Local residents** Employment, training and upskilling opportunities.	• Increase in turnover for existing/new boatyard operator and supply chain, leading to safeguarding/creating employment in sector. • Increase in boat repair skills base. • Increase in efficiency for local boat owners through convenience and cost savings from having local repair facility. • Increase employment, population and skills levels/qualification take up. • Increase financial sustainability of Harbour Authority through additional income.
Site for new aquaculture facilities	**Aquaculture companies/supply chain** Opportunity to develop facilities (e.g. harvesting/processing plant with quayside access). **Local businesses and residents** Increase business opportunities for existing/new businesses in supply chain. Employment, training and upskilling opportunities.	• Increase in productivity/turnover for aquaculture companies and supply chain, leading to safeguarding/creating employment. • Increase in aquaculture skills base. • Increase employment, population and skills levels/qualification take up. • Increase financial sustainability of Harbour Authority through additional income.

Hatston – key assumptions

Oil and gas supply base

- Additional berthing and quayside space, along with ex-pipe fuelling will enable Orkney to better serve the oil & gas sector as an operations/supply base, served by platform supply vessels (PSVs) and subsea support vessels (SSVs) and other offshore vessels.
- Orkney is in close proximity to the West of Shetland oil assets.
- Assumptions are based on Orkney handling between 2% and 5% of 2017 traffic at Aberdeen.

Aquaculture

- Potential requirement in short to medium term for a processing/harvesting facility with quayside access.
- One existing processing plant is near capacity and relies on all salmon transported by road tanker.
- This development would enable greater efficiencies and growth in the volume of farmed salmon in Orkney.

Other potential outcomes (unquantified)

- There are many other possible developments and benefits arising from enhancements to harbour infrastructure at Hatston: e.g. potential for the establishment of a boatyard repair facility, facilities for handling renewables, facilities to support other aquaculture activities, the development of a logistics hub, improving efficiencies around ferry and cruise operations, for example.
- These opportunities have not been quantified at present, given lack of clarity with regard to market requirements at this time.

Hatston – high level results

Project cost	£45.092m
NPV	£59.9m
Financial IRR	-£8.5m
Employment (direct + indirect & induced) in 2050	52
GVA (direct + indirect & induced) in 2050	£9.7m

Scapa Pier proposals – who will benefit and potential impacts

Pier extension and provision of deeper water	**Fuel operators and suppliers** Certainty that Orkney's internal fuel supplies can continue to be delivered to the existing tank farm at Scapa. **Oil and gas operators and businesses** Increased safety and efficiency will make Orkney Harbours more attractive as a service provider in this sector and enable much better support to vessels/platforms utilising the deep sheltered anchorage. **Local businesses** Continuity of supply of oils and fuels required by local businesses. Maintain and increase role of supply chain in servicing activity in Scapa Flow. **Residents** Continuity of supply of oils and fuels required by residents.	• Resilience of fuel supply for Orkney safeguards businesses and employment across all sectors. • Fuel operator can continue to operate fuel tank farm at Scapa, rather than construct a new farm elsewhere. • More efficient 'at anchor' operations, which will safeguard and potentially enable this sector of business to grow, which in turn leads to higher spend on supply chain activities. • Certainty of domestic and vehicular fuel supply enhances population retention.
Reclamation and marine leisure berths/slipway	**Local business – marine leisure sector** Provision of berths for marine leisure may act as catalyst for marine tour operators to grow their business or start new businesses. **Visitors** Provision of a dedicated berth for marine tour operators may enhance the visitor experience.	• Increase in marine leisure sector business activity. • Increase in marine tours offered in Scapa Flow, leading to increased visitors and spend.

Scapa Pier – key assumptions

Orkney's fuel supply

- Scapa Pier is the single point of entry for Orkney's entire supply of domestic and commercial fuels.
- Should the pier be out of action for any reason, then fuel would need to be shipped by road tankers across the Pentland Firth, then by road to the storage depot.
- Vessels bringing in fuel are getting bigger and some struggle to come alongside already.
- The project will reduce the probability of this being required, and hence deliver a potential cost saving over the current situation.
- Some vessels delivering fuel already struggle to come alongside, and this problem will continue to get worse as vessels get larger.

Vessel displacement and efficiency

- Lack of berthing and quayside space impedes efficient and safe handling of rigs and vessels at anchor – on occasion harbour vessels have to divert to Stromness which costs time and money.
- Should STS volumes continue to grow, there will be considerably more pressure on this infrastructure; with growth potentially impeded.

Marine tourism

- Assumed that a berth would be made available for marine tourism and a possible tour provider, given the lack of suitable berths for this elsewhere.
- At the same time berths could be used by small boat users, both leisure and commercial (not quantified).

Scapa Pier – high level results

Project cost	£12.988m
NPV	-£0.1m
Financial IRR	-£0.1m
Employment (direct + indirect & induced) in 2050	1
GVA (direct + indirect & induced) in 2050	£0.3m

Scapa Deep Water Quay proposals – who will benefit and potential impacts

New deep water quayside and yard terminal

Offshore wind farm developers
An option to manage offshore wind farms (construction and O&M) in Orkney rather than ports located further away – a new choice of port.

Oil and gas operators
A new choice of port for taking rigs and platforms alongside for much more efficient support and maintenance.

Local businesses
Increase business opportunities for existing/new businesses in supply chain.

Local companies may need to diversify/upskill/employ more people.

Residents
Employment, training and upskilling opportunities.

- Cost savings for oil and gas companies and offshore wind farm developers.
- Increase turnover in supply chain, alongside potential business creation and increase in skills base.
- Increase employment, population and skill levels/qualification take up.
- Increase financial sustainability of Harbour Authority through additional income.

Scapa Deep Water Quay – key assumptions

Oil and gas – handling rigs and platforms

- There are few facilities in Scotland and the UK that offer 20m depth of water that enables 6th generation rigs and platforms to be brought alongside for maintenance. Most of these rigs are serviced alongside in Norway.
- A rig generally comes alongside for 40 to 50 days and undergoes all maintenance requirements, which contributes significantly to the local economy: based on what happens now with rigs at anchor in the region of £400K per visit.
- It is envisaged that circa seven rigs could be serviced per year initially.
- There is already market interest in this facility.

Offshore wind

- Several sites for offshore wind farms are located in close proximity to Orkney, making Orkney the ideal port location for construction and O&M. Each site could host between 80 and 100 turbines.
- These sites are due to be leased in 2019, which could mean consent in 2024 and start of construction in 2027.
- In the base case, we have modelled sites going ahead from 2027 each with 80 turbines, which amounts to 20 turbines a year from 2027 to 2049.

Passing trade and vessel calls

- With this facility in place there is a likelihood that larger vessels, such as tankers, may choose to come alongside for maintenance.

Scapa Deep Water Quay – high level results

Project cost	£76.276m
Economic NPV	£29.7m
Financial IRR	-£3.4m
Employment (direct + indirect & induced) in 2050	16
GVA (direct + indirect & induced) in 2050	£2.4m

Stromness proposals – who will benefit and potential impacts

Marina expansion	**Visiting marina users** Additional berthing capacity for visiting boats **Local businesses** Increase in customer base (e.g. marina users) which may lead to expansion within marine supply chain or other sectors (e.g. retail, food, etc.) **Tourism sector in Orkney** Enhances the overall marine leisure market in Orkney **Orkney Marinas** Increased utilisation of berths	• Increase visitor nights • Increase spend on local goods, services and marine supply chain – this leads to an increase in supply chain capabilities and provision, turnover and employment • Make Orkney more attractive as a marine leisure destination • Increase financial sustainability of Orkney Marinas through additional income
Cruise pontoon	**Cruise ship owners/operators** Safer and easier tendering in of passengers safeguards port of call. **Cruise passengers** Improved access to shore excursions	• Increase number of cruise passengers coming ashore and spend on local goods and services .
Improving shoreside layout and traffic management	**Harbour users, pedestrians, ferry passengers and freight** All will benefit from improved buildings and facilities located in more appropriate locations, a safer and less congested quayside, improved marshalling areas. Incorporate development opportunities as part of facility enhancements.	• Increase efficiency and safety for all • Potentially increase economic activity if opportunities arise through improvements to facilities/buildings
Improvements to Copland's Dock and reclamation nearby	**Local businesses – fishing sector** Copland's Dock will be more efficient and easier to use for fishing boats Additional area of land for development close to the pier and water could be developed by fisheries-related businesses.	• Increase in efficiencies and safety for fishing boat owners • Increase in turnover for fisheries-related businesses

Stromness – key assumptions

Marina expansion

- The marina will be expanded with 12 new berths and there will be increased activity arising from this.

Cruise

- With a cruise pontoon located in Stromness, tendering will be safer and easier, thus safeguarding the current number of visiting cruise liners and encouraging more.

Marine leisure tours

- The presence of a cruise pontoon may be attractive to providers of marine tours and dive boats, providing safe access and egress for boat passengers.

Stromness – high level results

Project cost (of that considered in OBC)	£0.750m
Economic NPV	£4.6m
Financial IRR	-£5.1m
Employment (direct + indirect & induced) in 2050	5
GVA (direct + indirect & induced) in 2050	£0.1m

Lyness proposals – who will benefit and potential impacts

Creation of hard standing yard/storage area	**Scapa Flow activities/companies operating in oil & gas sector** Port site in close proximity to Scapa Flow activity, as well as West of Shetland sites for later decommissioning.	• Increase turnover in supply chain, alongside potential business creation and increase in skills base. • Increase employment, population and skill levels/qualification take up. • Increase sustainability of Hoy as fragile island community, retain/increase population, etc.
	Local businesses Increase business opportunities for existing/new businesses in supply chain. Local companies may need to diversify/upskill/employ more people.	
	Residents Employment, training and upskilling opportunities.	

APPENDIX E – ENVIRONMENTAL MITIGATION AND ENHANCEMENT MEASURES

Examples of mitigation and enhancement measures

SEA topic	Issue/impact identified	Mitigation measure	Proposed timescale
Air	Localised short-term effects of dust due to construction work.	Construction sites will be damped down in periods of dry weather; all equipment subject to regular audits plus good operating practices and maintenance programmes.	Construction
Biodiversity, Flora and Fauna	Works involving excavation and soil disturbance cause physical damage to and loss of habitats and, if active remediation is not carried out, these habitats may not return to former condition.	Design/implementation of schemes should minimise disturbance to biodiversity as well as wildlife protection measures. Undertake a peat survey and prepare a Peatland Management Plan, in accordance with Orkney Local Development Plan Policy 9E Peat and Soils. This will enable the project to be designed to minimise loss of, or disturbance to, peat. Identify appropriate areas for both the storage of surplus peat and overlying vegetation, and the relocation of these materials.	Design/EIA
Biodiversity, Flora and Fauna	Construction of Scapa Deep Water Quay would lead to damage and to loss of habitat in Gaitnip Hill Local Nature Conservation.	Development of a Construction Environmental Management Plan detailing how impacts on biodiversity, flora and fauna should be avoided/mitigated; appointment of Ecological Clerk of Works (ECoW). This should include preparation of a Peatland Management Plan as described above.	Construction
Biodiversity, Flora and Fauna	Impacts to European Protected Species through underwater sound changes during construction and operations.	Surveys to determine EPS and basking shark presence; where necessary application made for EPS license; where works may generate loud underwater noise a marine mammal observer should be present to undertake pre-searches prior to commencing work to ensure no cetaceans or otter are within 500m of operations for a 30 minute duration; appointment of ECoW. JNCC guidelines for minimising the risk of injury to marine mammals from geophysical surveys; minimise duration of impulsive sound activities (piling, rock blasting and sub-bottom profiling, follow JNCC guidelines for minimising the risk of injury to marine mammals from using explosives; follow Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling; use of bubble curtain.	EIA/ Construction
Biodiversity, Flora and Fauna	Disturbance to birds during construction.	Bird sensitivities should be taken into account and addressed through the Construction Environmental Management Plan. This may include timing certain activities to avoid the winter months, and others to avoid the breeding season. Consideration should be given to seasonal restrictions to avoid periods when birds are present in the pSPAs; construction works could be undertaken during less sensitive periods; appointment of ECoW.	Construction

Examples of mitigation and enhancement measures

SEA topic	Issue/impact identified	Mitigation measure	Proposed timescale
Biodiversity, Flora and Fauna	Disturbance to birds during operation.	Consideration will be given to identifying appropriate approach routes to piers and limiting vessel speeds in sensitive areas; consultation with key parties to identify and agree embedded mitigation measures.	Ongoing
Biodiversity, Flora and Fauna	Impacts of dredging on flora and fauna.	Ecological and environmental surveys; implementation of dredging mitigation strategy and good practices; careful timing of dredging activities; consultation with SNH. Agree with SNH and SEPA a suitable location for disposal of dredge spoil. Disposal of dredge spoil should be carried out in licensed areas where it would not impact negatively upon vulnerable marine habitats or the activities of other marine users.	Design/EIA
Biodiversity, Flora and Fauna	Habitat disturbance and loss due to shoreline reclamation.	Habitat survey should be undertaken to inform plans for re-vegetation and habitat enhancement, with a view to achieving net biodiversity gain; appointment of ECoW.	EIA/Construction
Biodiversity, Flora and Fauna	Impacts on conservation objectives of designated sites.	Undertake HRA at Project Level, to identify likely impacts on qualifying species and mitigation measures which should be implemented to avoid or minimise adverse effects to ensure no adverse effect on site integrity. Implement these mitigative measures through the Construction Environmental Management Plan. Good planning and timing of works and good construction and management practices; appointment of ECoW.	Ongoing
Biodiversity, Flora and Fauna	Introduction of invasive species during construction and operations.	Analyse proposed activities and shipping movements and identify potential sources of risk. Identify and agree biosecurity measures and implement Ballast Water Management Plan where appropriate; cleaning of equipment and plant machinery with management practices to prevent the spread of invasive species.	Construction
Cultural Heritage	Construction can result in the loss or damage to, historic environment features or may affect their setting.	Undertake a cultural heritage survey, the findings of which should be used to inform project design. Incorporate any mitigative measures into the Construction Environmental Management Plan. Construction will be undertaken in a manner that is sensitive to the cultural heritage and/or historic environment of the surrounding area.	Design/EIA

Examples of mitigation and enhancement measures

SEA topic	Issue / impact identified	Mitigation measure	Proposed timescale
Cultural Heritage	Possible presence of undiscovered archaeology.	Undertake an archaeological survey, the findings of which should be used to inform project design.	Design/EIA
Cultural Heritage	Construction of new infrastructure resulting in damage to, or loss of, cultural heritage including the maritime heritage.	Undertake an archaeological survey, the findings of which should be used to inform project design. Construction will be undertaken in a manner that is sensitive to the cultural heritage; any cultural features identified in the EIA and planning phase should be fed into the detailed design.	Design/EIA
Cultural Heritage	Construction of new infrastructure resulting in damage to, or loss of, cultural heritage including the maritime heritage.	If archaeological features are identified construction should be supervised by a qualified archaeologist and combined with sensitive construction methods and restoration to minimise potential damages. Any new discoveries will be logged and recorded.	Construction
Cultural Heritage	Changes to cultural setting (e.g. Impact on conservation areas).	Impacts kept to a minimum through sensitive design and planning.	Design/EIA
Landscape	Construction of new infrastructure may potentially cause negative impact on landscape during both construction and operational phases.	Undertake landscape and visual assessment to help inform design of individual projects through appropriate mitigation. Construction of new infrastructure will be undertaken in a manner sensitive to the natural heritage and/or historic environment of surrounding area.	Design/EIA
Landscape	Construction of new infrastructure may potentially cause negative impact on landscape during construction.	Impacts kept to minimum through sensitive design, good site practice and planning and adoption of Construction Best Practice.	Construction
Material Assets	New/extended infrastructure would require use of non-renewable resources (e.g. sand and aggregates).	Where possible, rock and aggregate should be sourced locally; where possible the use of secondary aggregate will be considered; it is also anticipated that a proportion of dredged materials could be re-used for developments.	Construction
Material Assets	Disturbance of local infrastructure during construction.	Address disturbance issues through the Construction Environmental Management Plan, in consultation with the relevant organisations, e.g. OIC Roads Service. Good site management, traffic and construction management plan and ongoing public consultation; adoption of Construction Best Practice.	Construction

Examples of mitigation and enhancement measures

SEA topic	Issue / impact identified	Mitigation measure	Proposed timescale
Material Assets	Increase in waste generation.	Prepare and implement a waste management plan.	Ongoing
Population and human health	Uncertainty over potential road safety.	Address road safety issues through the Construction Environmental Management Plan, in consultation with the relevant organisations, e.g. OIC Roads Service. Undertake road traffic assessments.	Design/EIA
Population and human health	Uncertainty over potential vessel collisions with new/extended piers.	Undertake navigational risk assessments.	Design/EIA
Population and human health	Health and safety risks due to presence of new infrastructure.	Address health and safety issues through the Construction Environmental Management Plan, in consultation with the relevant organisations. Good construction management practices and adoption of Construction Best Practice.	Ongoing
Population and human health	Disturbance and nuisance impacts from construction and operation on local communities.	Address disturbance and nuisance issues through the Construction Environmental Management Plan, in consultation with the relevant organisations. Good working practices, planning and timing; noise-producing activities such as piling should only take place during daylight hours; adoption of Construction Best Practice, continued liaison with communities regarding air, noise and vibration emissions during construction and operation.	Construction and maintenance
Soils	Construction of access roads would require land take and lead to land use changes and loss of soils.	Land take should be kept to a minimum.	Design/EIA
Soils	Removal of seabed sediments from dredging.	Re-use of dredged material where possible.	Design/construction
Soils	Contamination of sediments.	Address potential contamination of sediments through the Construction Environmental Management Plan prior to construction. Good management and planning to minimise contamination.	Ongoing

Examples of mitigation and enhancement measures

SEA topic	Issue / impact identified	Mitigation measure	Proposed timescale
Soils	Disturbance to and loss of peat.	Undertake a peat survey and prepare a Peat Management Plan, in accordance with Orkney Local Development Plan Policy 9E Peat and Soils which will enable the project to be designed to minimise loss of or disturbance to peat. Identify appropriate areas for both the storage of surplus peat and overlying vegetation, and the relocation of these materials. Good construction practices to minimise damage and loss of sensitive soils and habitat.	Design/construction
Water	Drainage of surface water from roads and other developed areas.	The inclusion of sustainable drainage systems should be incorporated into the design at planning phase.	Design/EIA
Water	Construction or maintenance dredging has the potential to result in increased suspended solids.	Development of dredging mitigation strategy; designs should ensure that Water Framework Directive (WFD) objectives are not compromised; undertake WFD Assessment for all developments.	Design/ EIA
Water	Construction or maintenance dredging has the potential to result in increased suspended solids.	Completion of all relevant licensing and permitting for dredging activities; timings of dredging to be planned appropriately.	Construction and ongoing maintenance
Water	Dredging required around certain piers in order to accommodate larger vessels impacting on flora and fauna.	Good management and planning should keep water quality impacts to a minimum using BAT techniques and technologies at all times.	Construction
Water	Potential for pollution incidents during construction and operation.	Strict planning and management of construction activities; preparation of emergency response plans; good working practices, in line with NetRegs guidance.	Construction and ongoing maintenance
Water	Potential for flood risk.	Each project should be subject to a detailed Flood Risk Assessment at planning phase. Design of new piers and related infrastructure should take account of climate-related predicted sea-level rise.	Design/EIA
Water	Potential for alterations to coastal processes.	Project design will be informed by detailed surveys and hydrodynamic modelling.	Design/EIA
Cross-sectoral	Dredging required around certain piers in order to accommodate larger vessels impacting on flora and fauna.	Agree with Marine Scotland, SNH and SEPA a suitable location for disposal of dredge spoil. Disposal of dredge spoil should be carried out in licensed areas where it would not impact negatively upon vulnerable marine habitats or the activities of other marine users.	Construction and ongoing maintenance