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Background

This proposal comprises approx. 597m long main quayside berth with general -15m CD water depth, incorporating a 135m quayside pocket with -20m CD water depth. Further north tug (3No.) and pilot boat (2No.) berth approx. 180m long with depths between -6 and -9m CD. Laydown area directly behind quay face approx. 22.85 Hectares. There will also be an access road from the A961 to the site.

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.

The proposal for Hatston comprises a 300m extension to the existing pier and the creation of 7.5 hectares of quayside laydown area through reclamation; there will be a ship lift and fuel facility incorporated in the development.

Both of these projects are currently being developed into scheme design and a site investigation has now been completed for both sites.

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Appendix A – Layout Drawings

1.0 Introduction

The following RAMS looks at the proposed construction activities of providing a deep water quay development, with general fill provided from the creation of laydown area and potential industrial site, and armour protection imported from both local and imported sources.

The overall location plan (Drawing 202042EIA-110) and phased layouts (Drawings 202042EIA-400 (Works Phase 1 Overall), 202042EIA-500 (Works Phase 2 Overall) and 202042EIA-600 (Works Phase 3 Overall) attached in Appendix A) shows phased details of proposed development together with surrounding infrastructure that requires to be protected during the works and when the facility comes into use.

The main areas of risk are the existing foreshore marine environment during quay construction together with disturbance of land through waste overburden excavation and storage (organic and clay) and water runoff protection of land and marine habitat.

2.0 Information Available

A hydrographic and sub bottom survey of the seabed has been obtained from Orkney Islands Council and existing OS maps for the proposed site with all levels indicated as being relative to Chart Datum for marine and land sites.

It is proposed that the main quay berth depth at the site should be a minimum of minus 15m to Chart Datum with a further phased deep water site to between minus 20 and 24m Chart Datum to allow for potential future requirements.

Based on Admiralty Charts and Tide Tables, the sea levels assumed in the feasibility report have been taken as follows based on most onerous data for quay design -

Mean High Water Springs +3.6m Chart Datum

Mean Low Water Springs +0.7m Chart Datum

0.0m Chart Datum is 1.69m below Ordinance Datum

3.0 Site Conditions and Services

After considering a number of other site locations, the chosen site for the proposed deep water development is just south of Burn of Deepdale in the Bay of Deepdale on the east side of Scapa and approx. 1200m from Royal Oak Military Wreck exclusion zone and approx. 835m from a fish farm site to south. The site would be accessed from a new two lane bitmac road approx. 1000m long and one footpath off the proposed realigned A961 road (by others). New services would be routed down the new access road within verge and adjacent swale ditches.

4.0 Scheme Proposal

Laydown Site

The primary principal of creating the deep water development site is to maximise and balance all excavated inert stone excavation from land to fill and form reclaimed land and quay works in the sea with all waste material not suitable for this purpose (organic soil, vegetated peat and clays) deposited and managed into material bunds on perimeter of the phased development site.

Initial construction will commence to form the access road to main cut and fill site together with laying of all ducts and services to the site within road verge. Initial bitmac surfacing will only be at new junction onto main A961 road until completion of deep water development site, at which time, the final road surfacing would take place.

The site would then have perimeter V ditches cut and silt retention installed ahead of land being stripped of all non- inert material (organic soil, vegetated peat along with unsuitable clays).

This shall be temporally stockpiled until the initial laydown areas are created to commence site perimeter storage bunds. Excavation would then progress to select, screen and stock pile inert stone and suitable glacial till that are free from all organic and clay material. This operation is likely to take place over several months (estimated 10 to 14 months per phase) and will involve heavy tracked plant to both excavate and rip material, together with pre-treatment of the harder strata through drilling 100mm dia. holes and controlled delayed explosives (approx. 25Kg per hole.)





Further to market engagement with specialist contractor then land earthworks production is currently estimated at **10,000m³ / week** (20,000T / week) per drilling rig used.

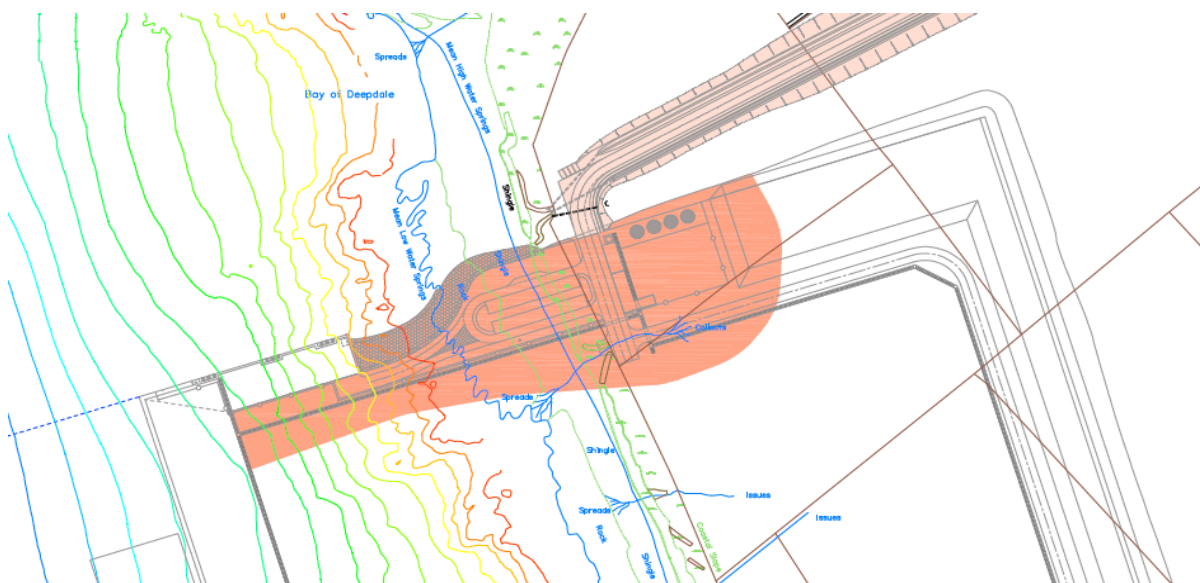
It is anticipated that up to 4no drilling rigs could be used per phase on site at any one time, therefore production would be upwards of **40,000m³ / week** (80,000T / week). With anticipated downtime / other site logistics this is reduced to estimated **35,000m³ / week** (approx. 70,000T / week).

The stockpile material described above would then become the main inert material fill source for future reclamation and quay works. Estimated volume of fill required in Phase 1 is approx. 925,000m³ (26 weeks to produce) with 125,000m³ of unsuitable overburden that will be stored and landscaped in permanent bunds around perimeter of site. Phase 2 approx. 765,000m³ (22 weeks to produce) with 60,000m³ of unsuitable overburden that will again be stored and landscaped in permanent bunds around perimeter of site.

Surface water management - Cut off ditches above works to prevent any water flowing on to site. SUDS settlement ponds likely required to minimise sediment flowing into sea. Potential flocculants balls proposed which can be used to aid ease of removal of sediments within settlement ponds. Would require SEPA approval.

Reclamation and Quay Works

Once sufficient suitable stockpiles of inert fill material is won the initial reclamation works would commence by forming the north perimeter reclamation bund leading from access road to the rear of proposed quay works (Phasing Sketch below).



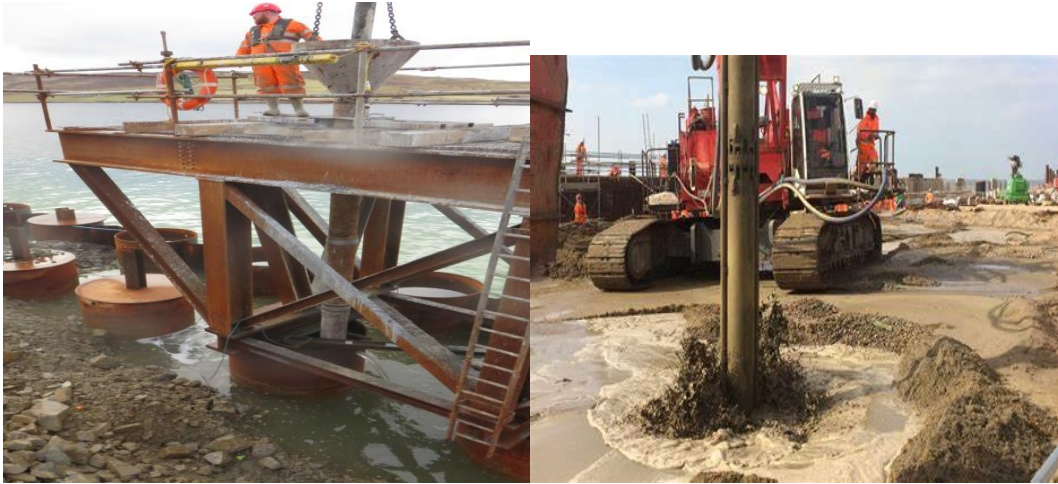
The bund slope faces would have geotextile placed together with silt booms placed in sea as the bund is progressed in order to mitigate the migration of fines followed by the placement of secondary and primary rock armour. While some secondary armour may be won on site, it is considered that the majority of armour stone will require to be imported to the site by either road or sea to cover a rock armour slope area in two interlocking layers of approx. 5,600m³. Once this reclamation perimeter bund and armour slope is formed then this shall provide the main land route to access the quay works construction site (-10m Chart Datum) for labour, plant and construction materials.

The main quay berth face is currently proposed as a solid quay constructed of steel tubular piles with interlocking sheet piles forming a combi wall solution with a further inner tied sheet pile anchor wall. This design solution has been assessed as appropriate at scheme design stage but may vary once final design and build tender procurement is progressed and contractors individual construction methods are known. This combi quay wall will support a concrete cope and deck directly behind followed by general hard core surfaced laydown reclamation area and drainage outside immediate wall active wedge area.

The anticipated tubular steel piles (approx. 2.1m dia.) for the quay wall require drilled rock sockets to provide suitable pile toe fixity below -15m CD dredge level. Bauer BG41 Drill rigs or similar will work over water from temporary piling platforms from the reclamation bund or a jack up barge with silt booms placed to seaward side.



Drill cuttings would be directed to temporary filter and silt beds on land with no discharge of cuttings to sea or watercourse. Tubular piles and sheet piles are expected to be vibro hammered to required depth (20 to 40 minutes /day) with no impact hammers anticipated at this stage. Piles will then be filled with tremie concrete.



After vibro piling compaction of reclamation fill and undertaking acceptable plate bearing tests of fill, tie rods are then installed and secured between front face and rear sheet pile wall and pre cast and in-situ concrete cope placed.



As the quay works advance south then the reclamation fill would advance behind thus affording additional sea fetch protection together with added silt boom used to shore.

Once suitable vibro treatment of quay fill has been undertaken to compact and reduce future consolidation and settlement (H pile on vibro hammer) then concrete deck immediately behind quay face will be placed (generally no less than 6 months after fill takes place) with remaining reclamation and laydown area capped and compacted with graded hard core surface with falls to V ditch and French drains.

Works phase 2 will always follow on from phase 1. Phase 3 would follow on after 1 and 2 quay works complete. Works Phase 1 starts Q4 2024 to Q4 2027. Works Phase 2 to be complete Q4 2028. See separate programme for overall durations.

Dredging

A further construction phase to the development is to dredge approx. 86,000m³ in front of Phase 1 and 2 new quay face to a depth of -15m Chart Datum using back hoe dredging technique followed by transfer of inert stone waste to split hopper barge for deposit within reclamation behind quay wall or, if unsuitable (silts – estimated approx. 30%/25,000m³), to a licenced offshore disposal site.

Phase 3 works to dredge approx. 90,000m³ to depth range -20 CD would be undertaken after completion of Phase 2 quays works using mostly back hoe dredging technique together with potentially cutter suction of isolated hard spots. All suitable inert dredge material would again be transferred ashore to Phase 2 south shore return and fill formation support to a precast and reinforced concrete slipway. No blasting is envisaged.

5.0 Risk Assessment & Method Statement

1.0 An updated otter survey to any previous study will be undertaken along immediate foreshore not more than 2 weeks before marine works commence on site. Any actions required from this study will be agreed and implemented before any works commence.

2.0 The total extent of the proposed marine works will be set out from fixed shore based control stations linked to Ordnance Survey coordinated grid system. Moored marker buoys will be placed on perimeter line of marine works to clearly mark the total extent of works.

3.0 Only inert stone fill free of all fine clay and organic material from adjacent industrial site excavation will be used for forming proposed marine access and reclamation core bund construction.

4.0 Ahead of filling works commencing from the foreshore then a silt boom will be moored out from shore ahead of advancing fill operation.

5.0 As core filling commences and advances inside moored marker buoys then completed core bund exposed slope profiles will have geotextile membrane placed and secured to slopes between MHWS and seabed toe to reduce migration of sediment as far as possible.

6.0 The advancing head of the perimeter core bund will be protected by the silt boom moored and advanced in front as core bund works progress.

7.0 Once a slope work front is finished and position and profile accurately checked against contract setting out coordinates then inert secondary and primary stone armour will carefully place over the protective geotextile slope membrane to permanently secure in place.

8.0 During construction works then a banksman will be observing any marine, sediment and material movement including further mitigation as required due to changing weather, wave and tidal action.

Only experienced marine contractors will be invited to tender for the works and they will be asked to submit a Contract Environmental Management Plan (CEMP), RAMS and Contractor Waste Management Plan (WMP) for approval by statutory authorities and construction contract as required and before any works commence on site. The CEMP will include construction restrictions during breeding seasons and methods for preventing and dealing with fuel and construction plant and material spillage during the works.