Environmental Impact Assessment Screening Report

Reconstruction of Berths 9, 10 & 11 Montrose Port

September 2025

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Contents

Appendices

Document history

Report Reference	Date	Notes
P2018-18-EIASC-R1	23 September 2025	Final issue

1. Introduction

Montrose Port Authority (MPA) is seeking to reconstruct the existing Berths 9, 10 and 11 within Montrose Port, as shown on Figure 1.

This document supports a request to Marine Directorate – Licensing Operations Team (MD-LOT) for a screening opinion under The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 for the proposed works.

2. Environmental impact assessment (EIA) Screening criteria

The works fall under paragraph 10(g) of Schedule 2 (Construction of harbours and port installations, including fishing harbours (unless included in schedule 1)) of Schedule 2 of the Marine Works (EIA) Regulations (Scotland) 2017, for which the EIA screening threshold is 'The area of the works exceeds 1 hectare'.

When determining whether Schedule 2 works are an EIA project, Scottish Ministers must take into account such of the selection criteria set out in Schedule 3 of The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 as are relevant to the works. These include the characteristics of the works, the location of the works, and the characteristics of the potential impact. Information to support this determination is provided in Sections 3 - 5.

3. Characteristics of the works

3.1. Size and design of the works

The works involve creating a new quay line and reclaiming land to create a new berthing face for Berths 9, 10 and 11, as shown on the drawings in Appendix A. The area to be reclaimed is approximately 6,800 m^2.

An associated capital dredge of up to 100,000 m^3 will deepen the approach to the berths and the berthing areas, as shown in Appendix A. The dredge area is approximately 23,200 m^2.

3.1.1. Construction method

A stone bund will be constructed within the reclamation area to facilitate the installation of the sheet piled wall. Stone will be sourced from a local quarry and screened at source to remove fines. Stone will be directly tipped into the reclamation area, with secondary placement by excavator.

Delivery of piles to site will be via sea. Tubular piles will be installed along the new quay line, within the stone bund, using either vibro or impact piling, followed by sheet piles. Once the combi wall is complete, the area behind will be backfilled to the design level and the stone bund seaward of the new quayside will be excavated and used as reclamation fill.

Services will be installed, then concrete will be poured to create the quay surface.

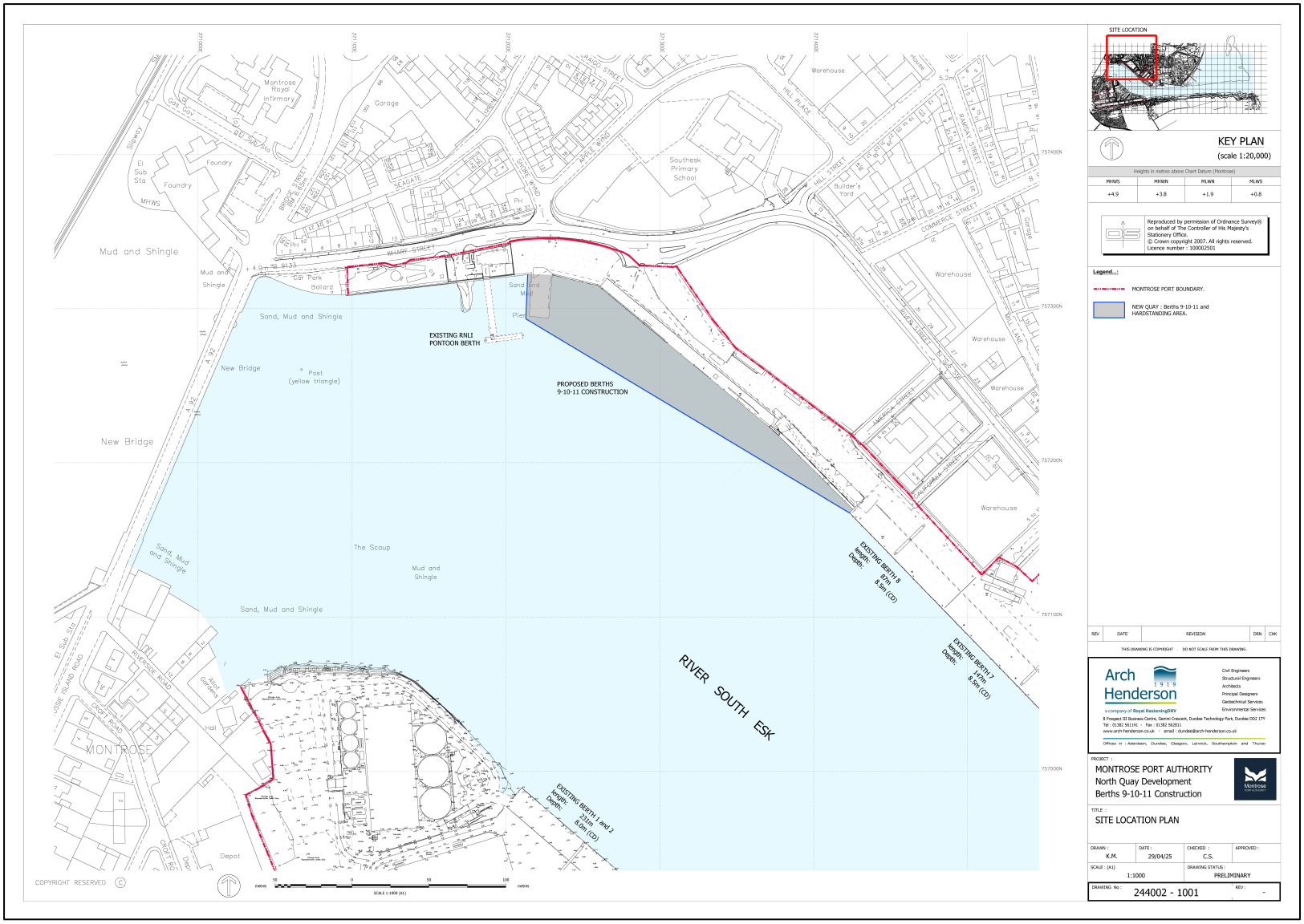


Figure 1 Location of Berths 9, 10 & 11

Capital dredging of the berths and approach area (see Appendix A) will commence once combi wall construction is complete, using a trailer suction hopper or backhoe dredger. It is envisaged that dredged material will be taken to a licensed sea deposit site – this will be subject to a Best Practicable Environmental Option (BPEO) Assessment.

Further detail is provided in the method statement in Appendix B.

3.1.2. Programme

Works are expected to commence in spring/summer 2026 and take approximately 18 months in total. The marine construction works (installing the stone bund and combi wall) are expected to take approximately 4 – 6 months. Dredging would be carried out towards the end of the programme and is expected to take approximately 1 – 2 months.

3.2. Cumulation with other existing works and/or approved works

No projects have been identified on the Marine Directorate Information licensing portal that are likely to be ongoing at the same time.

3.3. Use of natural resources, in particular land, soil, water and biodiversity

Natural resources to be used in construction include inert stone for the bund and reclamation, steel piles and concrete. Reclamation material will be sourced from a local quarry and delivered using the existing road network.

3.4. Expected residues and emissions and production of waste

The generation of waste in/near the marine environment during the works will be minimal.

Emissions to air are limited to the equipment that will be used for construction. This will include the use of excavators, cranes, piling rig, dredging vessels and ancillary equipment.

3.5. Pollution and nuisances

Adherence to the Scottish Environment Protection Agency's (SEPA) Guidance for Pollution Prevention (GPP) 5: 'Works and maintenance in or near water', which is standard practice for marine projects in Scotland, will minimise the risk of pollution incidents during the works.

Due to the nature of the materials used, construction activities will not generate significant levels of dust.

Sediment sampling in the proposed dredge area will confirm the presence of any contaminants of concern, which will dictate any restrictions on the use and/or disposal of dredged material.

3.6. Risk of major accidents and/or disasters which are relevant to the project concerned, including those caused by climate change

The risk of the works causing, or being affected by, major accidents or disasters is minimal.

As stated above, adherence to SEPA's GPP 5: 'Works and maintenance in or near water' will minimise the risk of accidents during the works.

3.7. Risks to human health (air pollution/water contamination)

The proposed works are within Montrose Port estate. As described in Sections 3.4 and 3.5, emissions, production of waste and pollution risks are expected to be small-scale and localised, so the risks to human health are predicted to be negligible.

As stated above, adherence to SEPA's GPP 5: 'Works and maintenance in or near water' will minimise the risk of water contamination during the works. Due to the inert nature of the materials to be used in the works, water contamination is unlikely.

Sediment sampling in the dredge area will confirm the presence of any contaminants of concern, which will dictate any restrictions on the use and/or disposal of dredged material to protect human health.

4. Location of works

4.1. Existing and approved land use

The proposed works are at an existing quay within the MPA area, surrounded by industrial port land. The reconstruction of berths 9, 10 & 11 will improve the existing facility and there will be no substantial change to the land use (terrestrial or marine area) as a result of the works.

4.2. Relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground; absorption capacity of the natural environment

The terrestrial environment is existing industrial port land. The proposed dredging areas are within the MPA area, subject to regular disturbance from existing port activities. The riverbed at this location is likely to be subtidal silt, sand and gravel, which is abundant in the local and wider area. It is considered unlikely that the natural environment/resources will be significantly affected.

There are no landscapes or sites of historical, cultural or archaeological significance that could be affected by the works.

5. Characteristics of the potential impacts

5.1. Potential impacts on designated sites and sensitive species

The proposed works are approximately 320 m from the Montrose Basin Special Protection Area (SPA). There are no other marine/coastal designated sites within 5km of the proposed works.

Montrose Basin SPA is a very large site (981.19 hectares) upstream of Montrose Port, which supports populations of several bird species of European importance year-round. There will be no direct or indirect loss of habitat within the SPA.

The quay construction and dredging will generate localised sediment plumes, which may move upstream into the SPA on flood tides; however, due to the very fast flowing tidal environment and large SPA, this material will disperse quickly and widely. Dredged material is similar in nature to the substrate within the SPA (extensive mudflats), so a limited amount of localised sediment deposition is considered unlikely to adversely affect SPA habitats.

Noise disturbance during the quay construction and dredging could temporarily disturb or displace birds from the immediate area of the works. Piling will create airborne and underwater noise – to minimise effects, all piling will operate soft-start and soft-stop techniques for the vibro-hammers, and for the impact hammers piling will commence at the lowest setting -25% energy, only increasing to 100% energy when required. Underwater noise propagation will be limited by the relatively confined nature of the river at the works location. Airborne and underwater noise will dissipate over distance (the works are 320m from the SPA boundary), and any birds that are disturbed from the locality of the works have ample similar habitat nearby within the SPA, so the risk of significant disturbance to birds is low.

Atlantic salmon from the River South Esk Special Area of Conservation (approximately 5 km upstream of Montrose Port) migrate downstream through Montrose Port in the spring. In accordance with marine licences issued for similar works in recent years, piling will not occur between 19.00 and 08.00; and a clear, unobstructed river channel will be maintained at all times to ensure passage of Atlantic salmon (as well as harbour seals and bottlenose dolphins).

To avoid injury to any marine mammals in the vicinity of the works, JNCC guidance (2010) on piling will be followed, as set out in the method statement in Appendix B.

5.2. Operational impacts

There will be no significant change to the operational use of the port facilities due to the works: the purpose of the works is to improve the existing facility. Vessels already use this area of Montrose Port on a regular basis so there are no new operational impacts.

6. References

JNCC (2010) Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise. Statutory nature conservation agency protocol for minimising the ris of injury to marine mammals from piling noise [accessed 23/09/2025].

Appendix A
Project drawings [provided separately due for file size]

Appendix B
Method Statement

Montrose Port Authority

Berths 9,10 & 11 Construction

Technical Submission

General Method Statement for major items of supply

FARRANS

Introduction: The information contained in this method statement takes cognisance of:

- Our experience of previously working in the Port of Montrose (most recently on Berth 7 and 8 reconstruction)
- Our design as developed by Farrans / Arch Henderson
- Our site visits to Montrose Berth 9, 10 & 11 have happened several times over the past 3 months
- The construction methods successfully employed in our previous Berth 7 and 8 reconstruction works i.e. conventional percussive piling techniques.

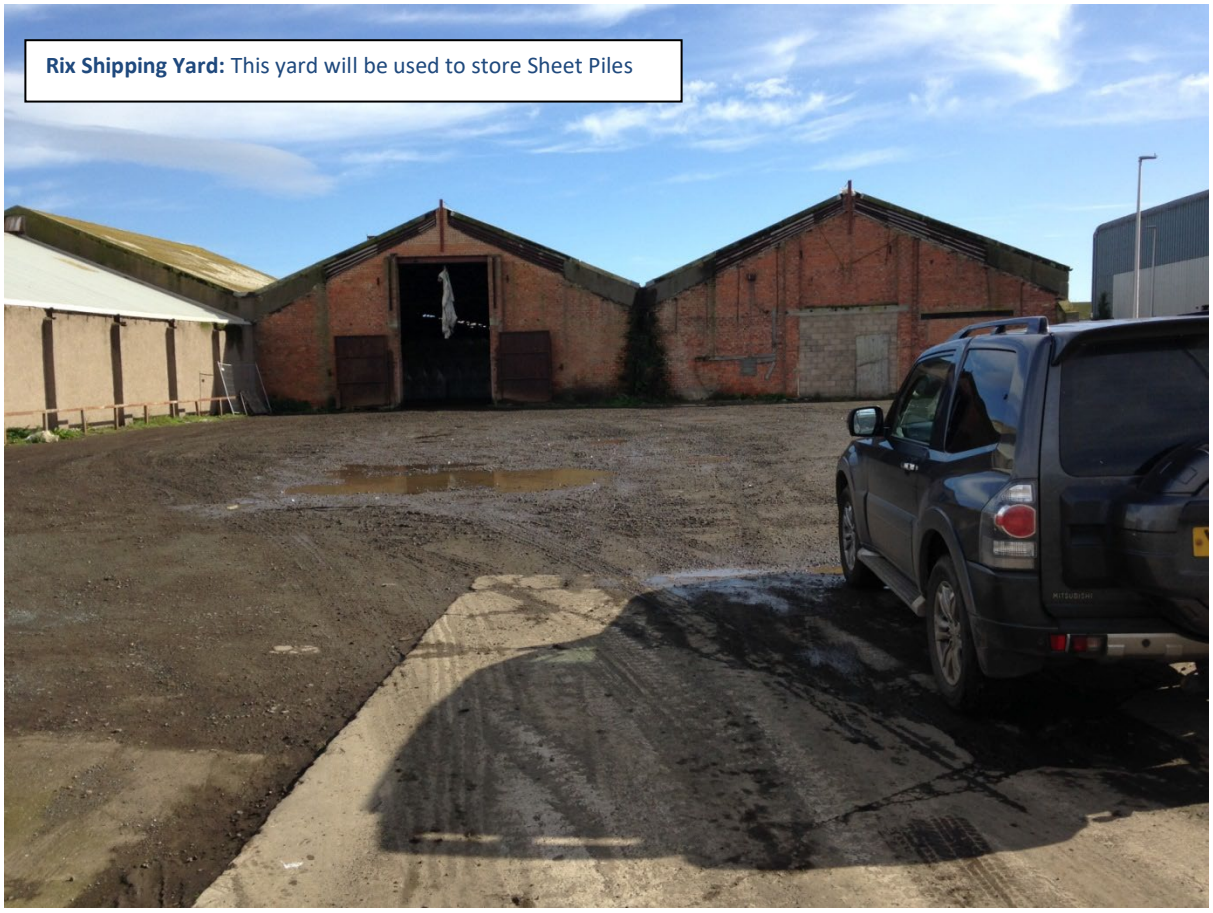
Our site visit was a general reconnoitre of the site, we confirmed all site logistics with regards to Stevedoring tubular and sheet piles, storage areas adjacent to the Berth 8 and 9 site for storing these piles and processing demolition arisings. We also confirmed transportation of materials to our work fronts.

Survey information has confirmed and added to the as built information provided by the Employer. This additional information has informed our design and has allowed us to configure our pile layout to best avoid clashes with the existing structures and services.

During this planning period we will work closely with our designer and have developed our design to a mature state in which we can order piles within a very short time frame should we be awarded the contract. Current procurement lead in periods for steel piles are c12 – 14 weeks.

Site Establishment / Mobilisation: During the mobilisation period our Project Delivery Team led by Farrans Site Manager will establish our site compound and accommodation in the area where we previously set up during the Berth 8 reconstruction works, adjacent to Ferry Road. We will connect to the local services i.e. power, water and sewerage.

We will re confirm all arrangements with Rix Shipping with regards to stevedoring and general logistics including material unloading , laydown, storage areas and material deliveries to Berth 8 and 9. We have agreed the following storage locations:



Rix Shipping Yard: This yard will be used to store Tubular Piles

Rix Shipping Yard: This yard will be used to store Sheet Piles and the waste ground in the background will be used to process and store excavated material

Traffic Management: As part of our Traffic Management Plan our Site Manager will liaise with the Client Project Manager and Supervisor to confirm arrangements for:

- Segregating all work related construction traffic from existing port traffic.
- Transporting steel piles and other materials through the North side of the port to and from Rix yards.
- Transporting our personnel to and from the quay side from our site compound adjacent to Ferry Road.
- Emergency services access through Port Security to Berths 9 and 10 with access off America Street

Farrans Site Manager will also liaise with the Harbour Master on a daily basis to coordinate steel pile deliveries by sea and vessel movements in the adjacent berths to ensure our works do not interfere with ongoing port operations.

During works on Berth 9 access will be maintained to Origin Fertiziers by utilising the existing roadway beside California and America Street as shown below.

Dilapidation Survey: Prior to commencing works on site a detailed dilapidation survey of residential and commercial properties will be carried out.

Whilst all public engagement will be managed by The Employer our customer care team lead by our Public Liaison Manager Marie Buchanan will assist in providing project related information.

Vibration Base Line and Monitoring: We will establish an independent vibration monitoring system for a period of 1 month prior to works commencing to establish a baseline and pick up existing port traffic / lorries / tractors / berthing impacts / road traffic etc. Continual vibration monitoring will then be carried out during combi wall installation, anchor tube installation and bearing pile installation. The vibration monitoring will be managed by Farrans Site Engineers who will issue a report to Montrose Port Authority Port on a weekly basis. The following images highlight the close proximity of residential properties to Berth 9, 10 and 11 work face:

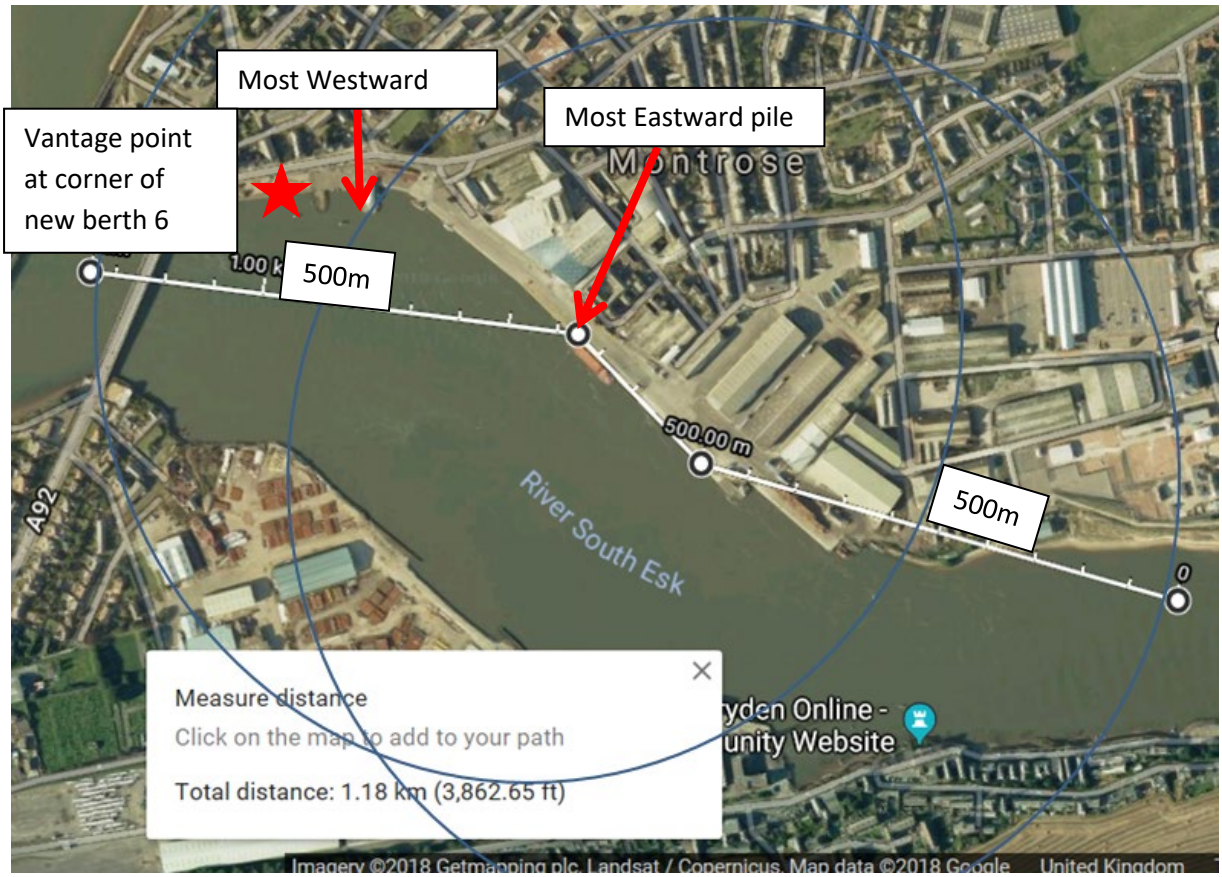
Image highlighting close proximity of residential properties to Berth 9, 10 & 11 work

Existing masonry wall and residents on California Street

Marine Mammal Observer: Our full time and site based team (site manager / engineers / foreman) will be trained in order to fulfil the duties of the MMO. A designated person will fulfil the role of Marine Mammal Observer with others deputising when designated person is not onsite, this will ensure MMO cover onsite site full time during all marine piling works.

During all marine piling we will follow the principles in `Statutory Nature Conservation Agency Protocol for Minimising Risk of Marine Mammals from Piling Noise` JNCC 2010.

There is a designated mitigation zone of 500m radius around the piling location. This zone can been seen marked up map below. The dedicated MMO will position themselves at a vantage point such that they can see the entire mitigation zone.



Prior to commencing piling the mitigation zone will be monitored for a minimum of 30minutes for the presence of marine mammals including whales, porpoises and seals. If no mammals are observed then piling can commence, if mammals are detected then they will be monitored, and piling will not commence until the mitigation zone has been confirmed clear for at least 20 minutes. JNCC forms including cover page, operations, effort and sightings forms will be completed as required.

When operating the piling hammers a soft-start system will be implemented, i.e. gradually ramping up power until full operational power is achieved. The soft start duration will be no less than 20minutes. If a marine mammal enters the area during the soft start process then, if possible, the piling operation will cease. If a mammal enters the mitigation zone when piling is at full power then there is no requirement to stop piling.

If there is a pause in the piling activities for more than 10 minutes then the pre-piling search and soft start procedure discussed above must be repeated however if the watch has been maintained throughout the piling operation then it is possible to begin the soft start procedure immediately.

Safety Boat: During the mobilisation phase and prior to commencing works on site, we will mobilise a safety boat and a dedicated trained crew. This safety boat will be on site for the full duration of the construction phase.

Installation of stone Bund:

Filling

- Fill to specifications of highway works series 600 table 6/4 method 6.
- * Wheel tipper lorry or ADT to deliver and offload 6A 100mm graded stone.
- Filling to take place by direct tipping and secondary placement by excavator.
- Where vehicles are reverse direct tipping they should be accompanied by a banksman and have stop blocks in place a safe distance from the tipping point.
- 30tonne excavator to place and shape bund in line with temporary works design outlined in this method statement.
- Bund past -3mCD to be constructed using long reach excavator utilizing machine control GPS guidance for dimensional control.
- Where stone is to be stockpiled, stockpiles should not exceed 5m height and be safely and suitably battered for material class.
- Bund to proceed from existing roundhead working due south as dredging works progress.
- Temporary bund to be constructed across proposed quay width to existing sheet pile head until dredging works are completed.
- 6A material to be hydraulically compacted where possible.
- Where Hydraulic compaction becomes challenging above mid water mark ~2.5mCD SHW method 6 compaction.
- Face of bund to be protected by an Underlayer 29Kg class stone 0.45m THK and 1.1m THK 436Kg Rock armour facing.
- **Great care to be taken to ensure no underlayer or main rock amour to be placed inline of pile wall as this could detrimentally affect pile driveability.** Only exception to this is edge protection above 5mCD, see **Figure 4: Cross Section**
- Underlayer material to be used as temporary protection for bund faces exposed to tidal degradation during proceeding works, this is to be in place during large tides or high seas. A member of Farrans Construction management team to make judgement on requirement.
- Temporary protection to be removed before filling works commence.
- Rock armour configuration dependant on seabed depth, see figures 1 – 3 cross section drawings.

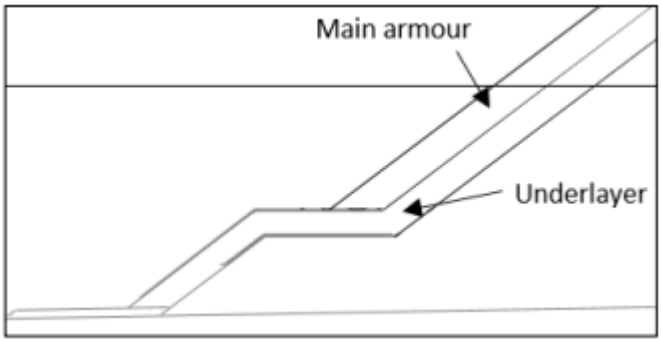


Figure 1: Depth greater than -7.0mCD

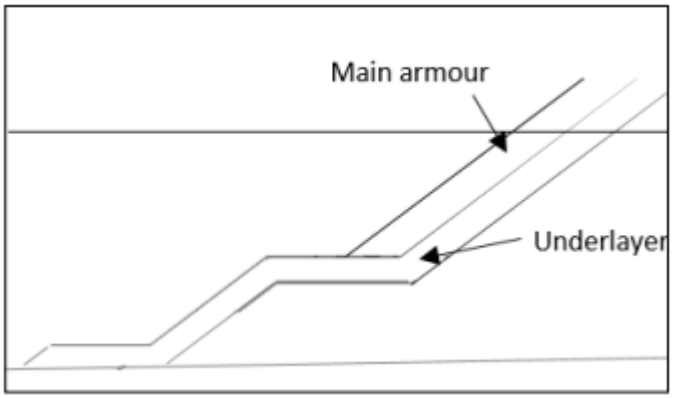


Figure 2: Depths greater -3.0mCD

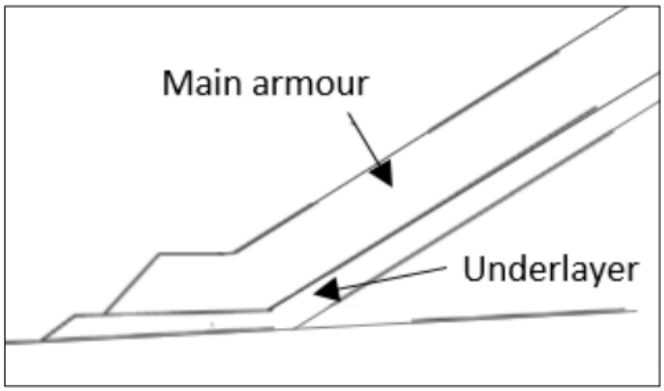


Figure 3: Depths less than -3.0mCD

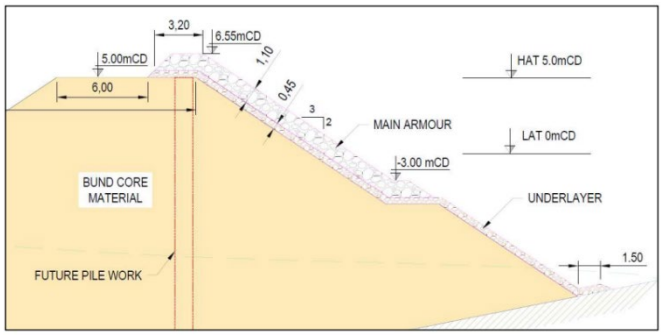
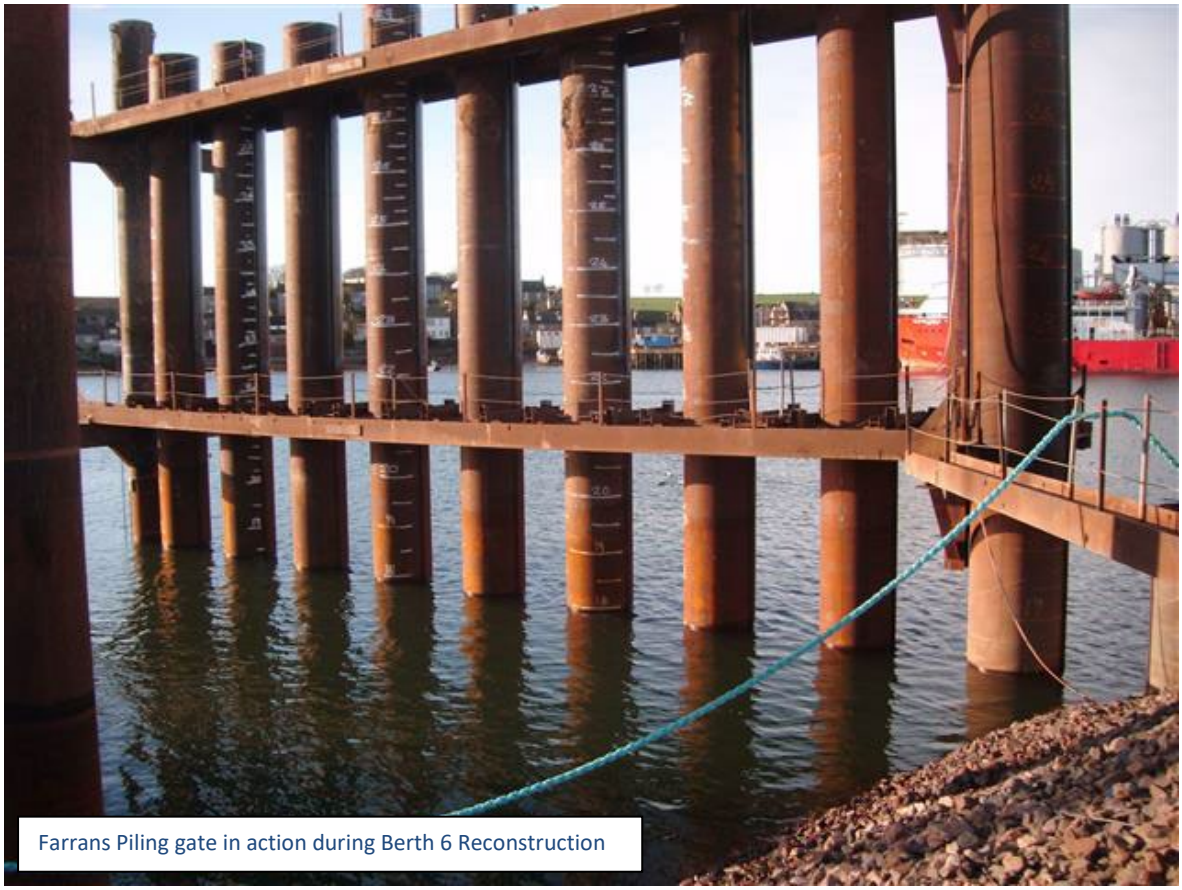


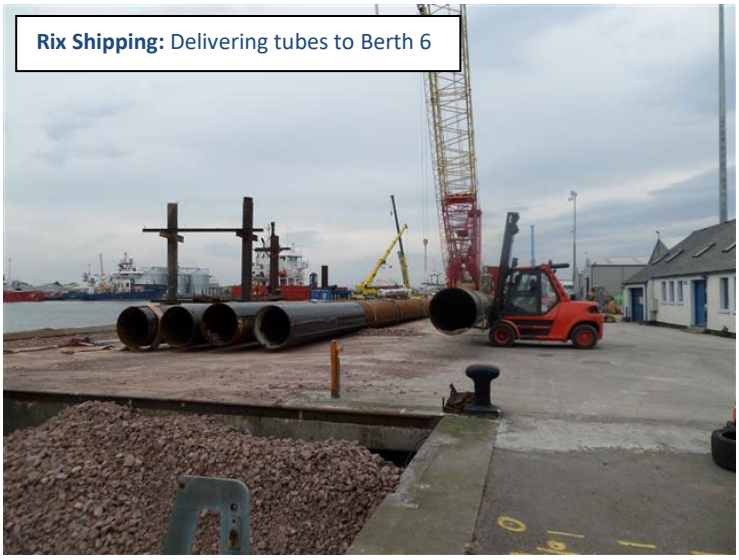
Figure 4: Cross Section

Fabricate Temporary Piling Gate: Immediately after the stone bund has been installed we will commence fabrication and testing welds on our piling gate in preparation for combi wall construction on Berths 9,10 & 11. All piling gate materials will be transported via triple extender trailer from our Oakbank plant yard in Edinburgh to Montrose Port for alteration / fabrication to suit the temporary works design from RPS for the conventional piling gate. During this fabrication period we will utilise a crane and forklift to offload and move gates about to facilitate safe fabrication.



Farrans Piling gate in action during Berth 6 Reconstruction

Delivery tubular and sheet piles: Delivery of all tubular and sheet piles to site will be via sea. The piles will be delivered to site in two phases to suit. The piles will be unloaded by Rix shipping and delivered to Rix yard outside the port. All logistics have already been confirmed and agreed with Rix Shipping and is similar to the operation we successfully carried out during Berth 8 reconstruction works. We have established that we can accommodate 6 no. tubes on the berth at one time therefore Rix will deliver on demand on a daily basis utilising their triple extender, 2 no. 16 T forklifts. Rix will also move the piling gates back and forth from the storage area to site.



Rix Shipping: Delivering tubes to Berth 6

Anchor Tube Installation: The 660mmØ anchor tubes will be installed from +4.9mCD to -7m CD utilising a hard drive rig. The anchor tubes will be backfilled with U/S to below tie rod level and cover with a temporary steel plate to protect during backfilling works. The entire area will then be backfilled back up to existing ground level to allow access for the 300T crawler crane. In an attempt to mitigate noise and vibration during all piling operations we will operate soft-start and soft-stop techniques for the vibro-hammers, and for the impact hammers we will commence at the lowest setting -25% energy, only increasing to 100% energy when required.

On completion of the anchor piles we will then install the temporary crane platform in position to accommodate the 300T crawler crane. The temporary works design will accommodate a 300T crane to travel safely along the existing quay. The design of this temporary crane platform will highlight the limits in which the 300T crane should not pass especially in Berth 8 where the existing suspended quay and masonry wall is located. The 300T crane will be mobilised to site (20 lorry loads approx.) and built with a slave crane that Farrans will supply in the area dedicated to site accommodation. When complete it will be tracked down to the quay.

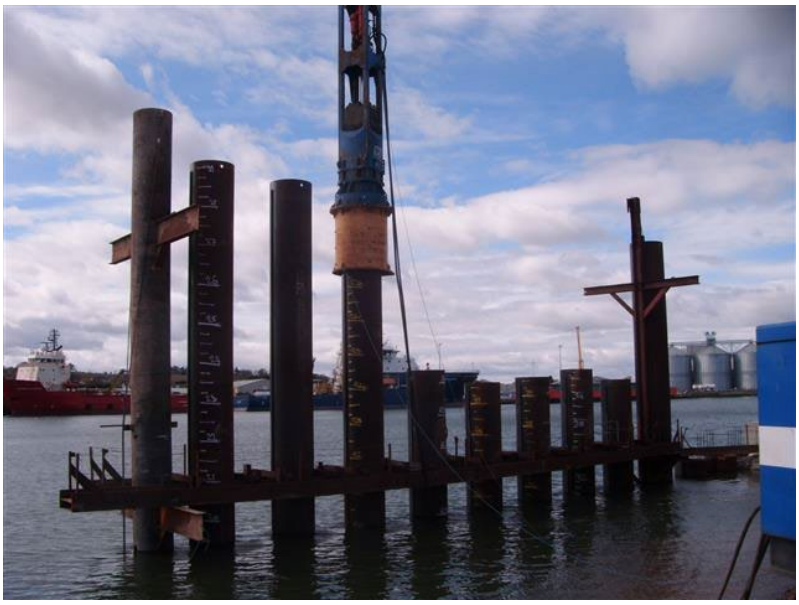
Combi Wall Installation: We will mobilise our piling crew and set up the pre-fabricated piling gate ready for combi wall installation.

Our Engineer will confirm line and toe position of existing quay wall prior to commencing piling.

Fully install the phase 1 combi wall

Install 1219mm Ø Tubes: Set up the first gate using 2 no. 914mm, 20mm thick spud piles, 2 no. sliders, heavy walled box pins, 914 beams and weld into position as set out by the site engineer. Each tubular position will then be marked out by Farrans engineer on the gate on both levels of the gate and the cross bracing welded to retain the pile during vibro and impacting. Each gate will contain 6 no. tubular piles. There will be 6 gates to set up along the first phase. The last tubular pile will not be fully driven in each gate to allow the hanging bracket to be installed for the next gate set up. All tubes will be installed for phase 1 via vibro and impacting

keeping close eye on noise and vibration levels utilising PTC 65 and CG300 hammers. With our recent experience of working in Montrose and studying the recent SI information we are assuming no rock out crops and no need for drilling and driving.



Install AZ18-700 Sheets: The piling gates will be removed for storage at Rix yard. All sheet piles will be transported by Rix back to quay over c3 days. The sheet piles will be split from the bundles and set down individually and the weep holes burned out in each section of pile, and paint repaired locally. A walkway beam and hanging brackets will be placed on the combi tubes to allow sheet pile installation utilising PTC 30 and CX110 hammers. The toe of our Sheet piles will be to the design depth.

Noise and vibration: Please see earlier section on MMO for controls regarding marine mammals. In an attempt to mitigate noise and vibration during all piling operations we will operate soft-start and soft-stop techniques for the vibro-hammers, and for the impact hammers we will commence at the lowest setting - 25% energy, only increasing to 100% energy when required. We will also utilise the CG Hammer Noise Suppression System ***(Please refer to Appendix 1 for details).***

When the combi wall is fully installed we will fill the gap between the new combi wall and the existing quay with imported material up to c-4mCD, this fill level will limit outward deflection of the new wall. The clay ground is very sensitive to deflection and we get an outward deflection without much benefit of pre-bend in the piles. Therefore a limited amount of backfilling is feasible before the tie–rods are installed. After the tie rods are installed, we will install the remaining fill to allow jacking of the tie rods and locking off at a pre-set value of c30%-50% of the final load.

We will then install a walkway beam with double handrail the full length along the landward side of the combi wall for safe access to the tubes.

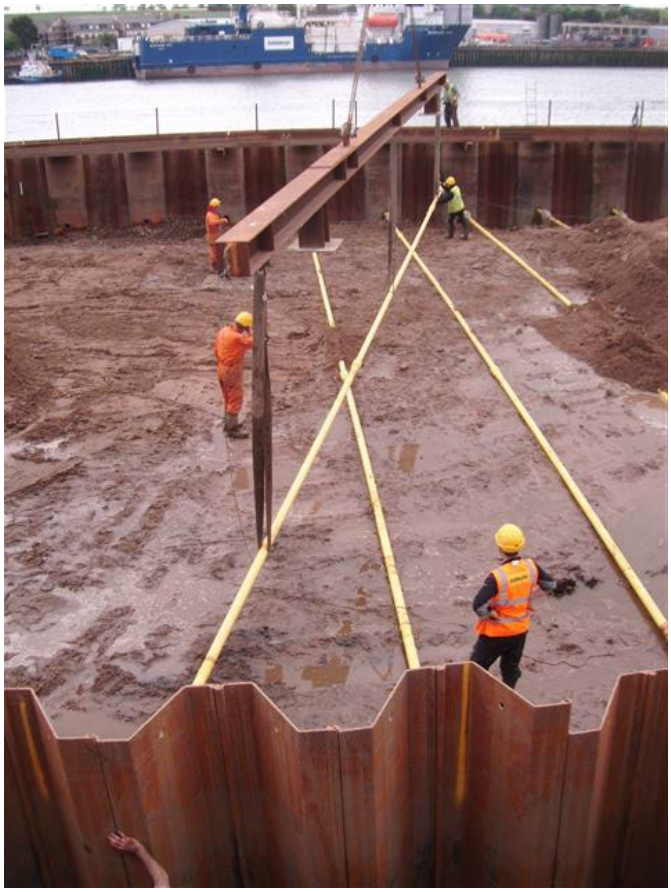
The tubes will then be filled up to tie rod level and concrete poured to seal and provide a dry footing for operatives working inside the tubes. We will then install a PFC to inside of tube and weld in position. We will mark out and cut a circular hole for the tie rod, it should be noted that the tube is now tidal. All exposed steelwork above -2.0 CD will be factory blasted cleaned to SA 2½ grade and black epoxy painted 400 microns d.f.t. Local repairs to the paint will be applied on site if required.

Tying into Berth 9: We will airlift the seabed and place a Proserve bag (or similar) between the back of our combi wall and the existing sheet piles and fill with concrete. The airlift will allow the bag to fill the main void down to future dredge level. We will then install a section of short sheet pile to form a return wall to close off behind the existing quay wall line once the deck is removed.

Tie Rod Installation We will then break out existing suspended deck slab along the entire Berth 9 and 10 and take away to Rix yard for processing utilising 2 excavators and dump trucks. We will utilise welder / burners to deal with existing reinforcement steel in the existing concrete deck slab.

Processed fill will be delivered from Rix yard and placed (in suspended jetty footprint) up to the underside of new tie rod level, to the rear of the existing sheet pile wall. This will naturally displace the existing silt in the suspended jetty area. We will ensure that a coarse graded material c100mm down is used to displace the silt.

It is noted that the existing sheet pile wall is tied through the masonry structure to an existing dead man wall. The length of these existing sheet piles are unknown. At all times we will ensure the integrity of the existing quay wall, tie rods and anchor wall. It is not our intention to destress the existing tie rods at any time. Our design has been developed with a safe system of work to mitigate the risk of deep excavations by keeping the new tie rods as high as possible and above the existing tie rods.



We will then demolish the existing masonry wall structure down to our tie rod design level and clear the ground of all obstructions right back to the preinstalled anchor tubes. We will utilise excavators and dump trucks drawing material back to Rix yard for processing. The existing cope beam will be removed at this stage and taken to Rix yard for reprocessing. At this point the positions of the new 339mmØ bearing piles will be marked out and the excavator will excavate a hole locally to check for existing obstructions. It is anticipated that a hole 1m x 1m will be cleared through all concrete structures including the existing relieving slab to allow the bearing piles to be installed at a later date. This activity will take a number of tidal shifts depending on structures encountered.

All localised holes excavated to accommodate the new bearing piles will be refilled with graded recycled material to the underside of the new tie rod level.

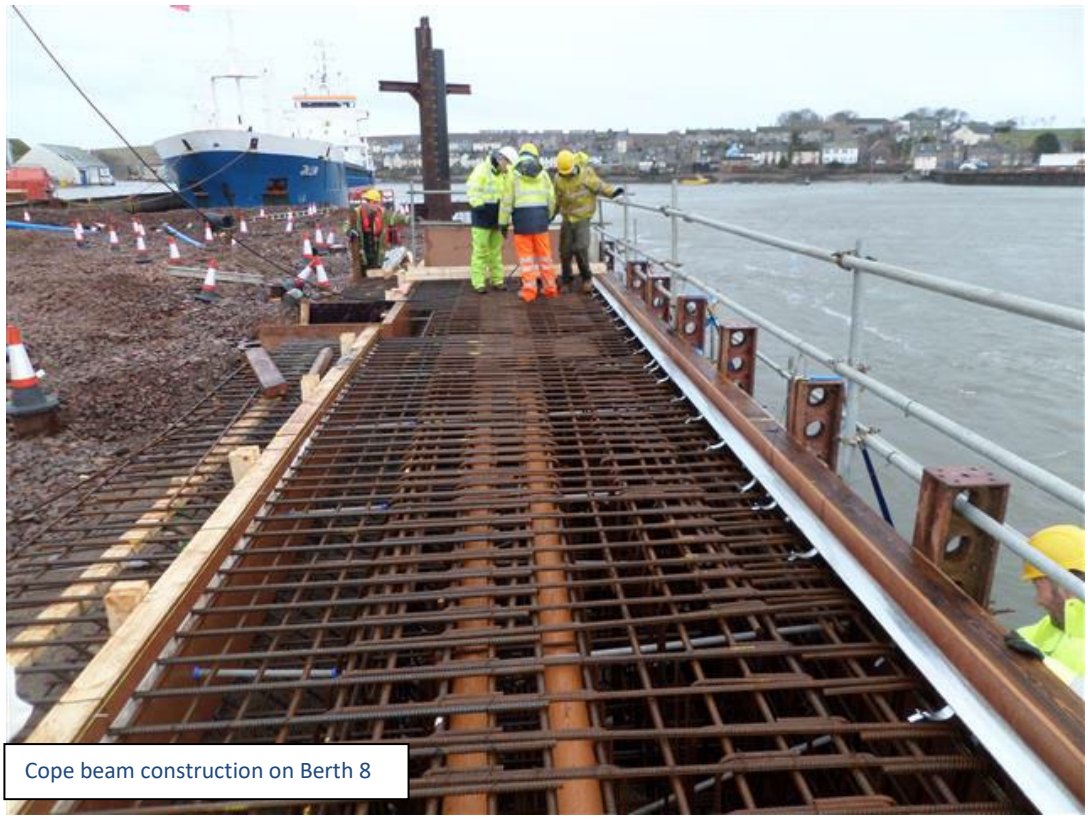
A hole will then be burned in the Anchor tube and the M80 tie rod fed right through the tube and 3m beyond so that the tie rod can be fed back through the existing sheet pile wall and into the combi tube, this will take a tidal shift. The next tidal shift the washers and nuts will be installed on the tie rods with the plates either side being tacked into position. This process will be repeated until all tie rods are installed.

Concrete Plugs and Cope Beam: Combi wall and anchor wall concrete plug installation: The Concrete plug on the main combi wall will be c2m deep with tie rod nut and bearing plate embedded at centre of tube. Concrete will be installed utilising a concrete pump. A short length of tie rod will be fitted with a pad eye & fork hinge at c0.5m from the back of the tube to allow articulation of the main tie rod. Similar pad eye

& fork hinge at 0.5m from the front of the anchor tube will also be installed to allow articulation here also. The concrete plug at the anchor tube will be 2m deep and the tie rod will protrude right out through the back to allow tensioning. Curved bearing plates will be utilised to suit the outside rear face of the anchor tube.

The gap between the Combi tubes and existing quay wall is now completely filled with imported material.

The entire area will be backfilled above MHWS , this process will allow the combi wall to move into its final position . The tie rods will then be tensioned and locked off at 30-50% of the required load and the open trench behind the Anchor tubes will be backfilled.



Cope beam construction on Berth 8

Steel fixers will then prefabricate the Cope beam in 12m sections, taking into account the positions of the new tubes/sheets, ladder positions, grab chain positions and bollard positions. We will then pour the cope beam in 20m bays via a concrete pump to the finished cope level +6.0mCD. All quay furniture will be replaced like for like and in their original positions.

Bearing Pile Installation: We will construct the predesigned temporary working platform to accommodate the bearing pile piling rig. Level should be set at MHWS + 0.5m = + 5.35m CD

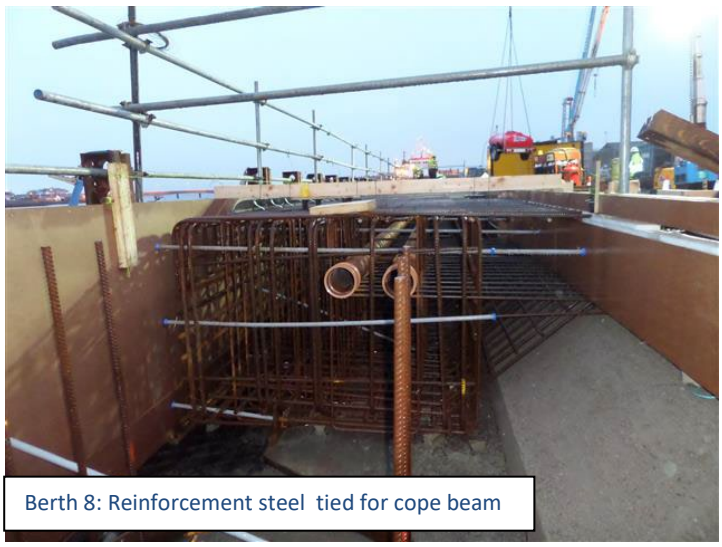
We will mobilise our percussive piling rig and install the 339mm Ø tubular steel bearing piles along the 3.9m grid in the filled section (existing suspended quay location) and through the pre-broken areas of the existing relieving slab.

Note: In order to accommodate unforeseen obstructions our design is flexible and has a tolerance of 1mØ in which we do not require a redesign if an obstruction is encountered.

The 339mmØ bearing pile head connection detail will be prepared including installation of false soffit and reinforcement. We will then install the concrete bearing pile head to top of tube in preparation for the RC Concrete slab.

The gap between the Combi tubes and existing quay wall is now completely filled with imported material.

The entire area will be backfilled above MHWS , this process will allow the combi wall to move into its final position . The tie rods will then be tensioned and locked off at 30-50% of the required load and the open trench behind the Anchor tubes will be backfilled.



Berth 8: Reinforcement steel tied for cope beam

General Deck Construction: We will then install all ducting, water mains, drainage and the interceptor in Berth 9, The design of these services will take cognisance of existing and new infrastructure. The areas to the rear of the new berths will be backfilled in layers above MHWS (+4.85mCD) as per the Specification for Highway Works

The 339mmØ bearing piles will be cut to slab embedment level and the head connection detail will be prepared including installation of false soffit placed inside each 339mmØ bearing pile, reinforcement cages and concrete plugs.

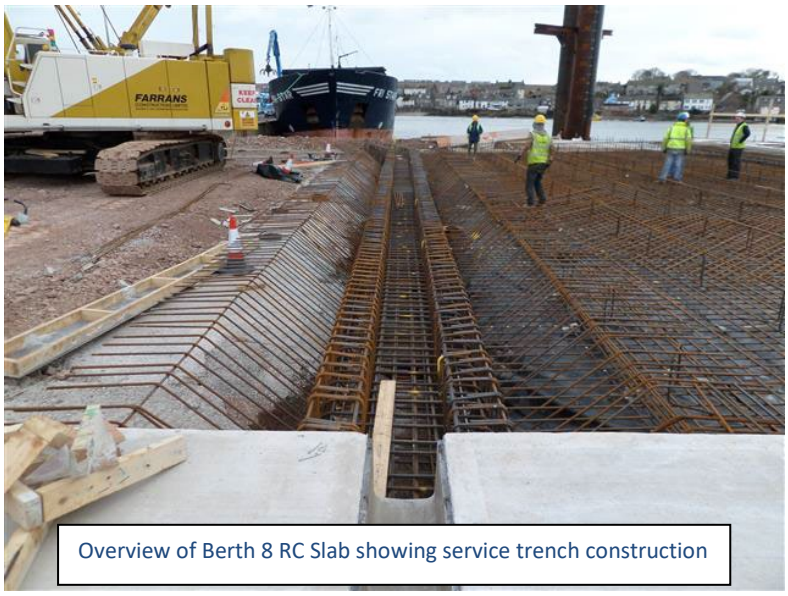
The two service trench bases will then be excavated and blinded. Reinforcement steel will be tied, the base shuttered and poured, the service trench walls will be tied to underside of main slab and poured. The soffit for the service trench covers will then be installed, all angles will be welded into position for service trench covers and ducts to cope beam installed.

The slab formation will then be graded to level, with deepened sections around the perimeter of the slab, around bearing piles and at the Aco channel locations. These deepened areas will then be blinded and 1000 gauge polythene placed, Reinforcement steel will then be tied. We propose to install the deck at 1:80 min fall back to the drainage channel and then install the rear slab at 1:60 maximum gradient, which would permit approximately 45mm settlement at the rear of the deck while still remaining within tolerances.

The Aco channel will then be installed with lifting beam and welded into position. All fire hydrant formwork, slab edge shuttering, duct chamber formwork installed. Concrete will then be pumped into slab, sizes will

depend on configuration of the movement joints. The slab will then receive a brush finish, and 4" steel float around perimeter. The ground bearing slabs will be constructed in a similar fashion without the piles.

We will then Install quay furniture – ladders, grab chains, bollards. At end of both phases install anodes (CP) with Divers. Anodes will be nominally 125x125mm x 2m long and require 285nr of these with a total of 24.5t of anode material. Anodes will be standard with 30mm Ø bar protruding for welded connection to piles.



Overview of Berth 8 RC Slab showing service trench construction

Overview of Berth 8 works showing Aco channel installation

Appendix 1

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CG Hammer Noise Suppression System

- 1500mm dia pile sleeve fully insulated with dedicated noise reducing foam
- Insulated up to pile wall with minimal gap to fully supress noise/echoing All open apertures enclosed with insulated panels
- Nylon dolly in drive cap
- Dedicated noise insulating blanket to cover full height of pile sleeve

- 250mm thick nylon dolly in drive cap
- No steel to steel impact
- - 92 DBA @ 15 m
  - 86 DBA @ 30 m

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