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OUTLINE METHOD STATEMENT

22-249 Installation of Twin Wall Sheet Piled Cofferdam, Quay Wall Remedials and Lagoon Lining

Annan Harbour
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Document	Status	Author
22-249 Outline MS	Draft	[Redacted]

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SECTION 1

1.1 Scope of works

This is an outline method statement which will be developed to construction phase working document in conjunction with all parties before the start of the works.

The works generally consist of the following elements:

1. Enabling works, including mobilisation of all plant & equipment
2. Installation of a 72m (approx.) twin wall sheet piled cofferdam with ancillary water control features
3. Remedial works to existing quay wall, including pointing, repairs and grouting
4. Lining of lagoon with bentonite liner and ancillary civils work

Drawing
22007 100 F – Location Plan
2207 101 H – Existing Site Plan
2207 112 C Harbour Wall Elevation, as existing and down takings
22007 301 M – Proposed Site Plan
22007 423 C – Harbour wall elevation, as proposed
22007 651 C – Harbour wall details, as proposed
21.2092-NAR-XX-ZZ-DR-S-22000-P01-Sections
21.2092-NAR-XX-ZZ-DR-S-00001-P02-Excvation and Resin Injection
21.2092-NAR-XX-ZZ-DR-S-00010-P02-Dam Layout and Sections
22007 424 – Harbour wall elevation, as proposed
22007 112 B – Harbour wall elevation, as existing and down takings
21.2092-NAR-XX-ZZ-DR-C-00002
21.2092-NAR-XX-ZZ-DR-C-00010

This outline methodology statement should be read in conjunction with the outline construction programme.

22-249 Annan Harbour Outline Construction Programme

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SECTION 2

2.0 Specialist Plant & Equipment

Equipment	No	Operator	Image
Modular Pontoon until with MEWP (8 Piece 10mx14m)	1 Unit 1 River class Tug 1 30t Excavator 1 safety boat	1 Skipper 1 Deckhand 2 Operatives	
Lond Reach Excavator (Land based)	1	1 Operator	
38t Excavator with side grip Movax (to be positioned on pontoon)	1	1 Operator 1 Pile hand 1 Welder	
Amphibious Excavator (lining works)	1	1 Operator	
LGP Excavator	1	Operator	
Tracked Dumper LGP	1	Operator	

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2.1 Outline Proposed Methodology

2.1.1 Initial site set up

On successful approval of the LAWS CPHSP, pre-start condition survey and approval of any temporary works design a temporary site compound area will be established to Land & Water Services (LAWS) "Safety First Standards" and secured using Heras fence panels. This will provide access for the initial vegetation clearance works and the preparation of the mobilisation points for all the plant & equipment. It is envisaged that the main compound will be established quayside with a access ramp being constructed to north of lagoon.

A detailed emergency plan will be posted in the welfare and offices this will have all contact details of the project team, Hospital routes will be displayed along with other emergency contact details.

All deliveries of plant and equipment will made by public highway and in line with the proposed traffic routes and proposed haulage routes.

The traffic management plan will be implemented, constantly managed and updated as and when required according to any changes throughout the works.

2.2 Enabling works

2.2.1 Vegetation clearance

The client will ensure that all vegetation works are undertaken prior to mobilisation.

2.2.2 Temporary Access

It will be necessary to construct a temporary crane pad quayside to enable the mobilisation and installation of the modular pontoon unit including the tracking on of the piling excavator. Given the radius from quay side it is considered more efficient to undertake the piling from pontoon either afloat or grounded. To the north of the lagoon a site access stoned ramp will be constructed to enable plant and material access to the lagoon.

2.2.3 Mobilisation of floating equipment

LAWS will first construct a suitably designed temporary crane pad which conforms to the Temporary Works requirements and will double as a mobilisation point for floating craft and an unloading area.

Our inhouse Mobilisation Team will prepare the mobilisation pack which will fully describe the operation, haul routes and methods for the mobilisation of Plant & Machinery.

All floating plant will be brought to site by HGV's following the agreed HGV delivery routes and mobilised into the River Arran from the crane pad. The modular Ravestein Pontoon, MEWP and River Class Tug will be lifted into position and assembled within the navigation.

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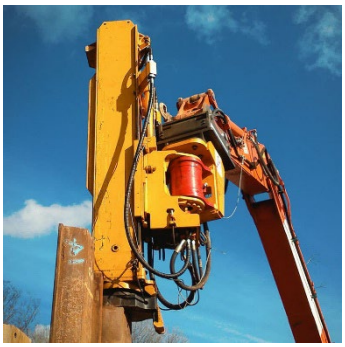
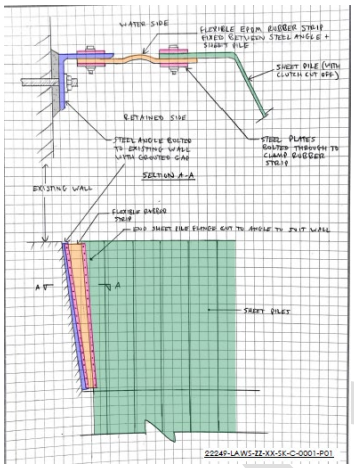
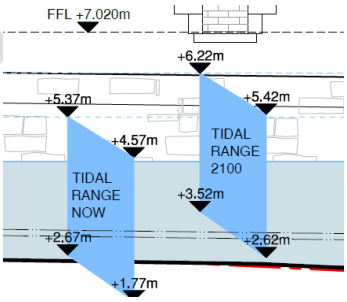
2.3 Pile Installation (Tidal working), Sluice and Pipe installation



Subject to a pre-contract driveability assessment the twin wall sheet pile cofferdam will be installed by combination of Movax and back driving. The excavator will be mounted on the modular pontoon providing excellent access to the working area. There will be a service crane landside which will load out the piles to the pontoon deck for onward handing and installation. At the moment it is assumed to be a 38t excavator with SG75 side Movax unit for the initial pitch and driving of the piles. It is assumed that the piles will be driven in singles. A degree of back driving is anticipated based on the interpretation of the background GI, so allowance has been made to mobilise a DX25 impact hammer for final drive to design level.



Once the piles have been installed to design level, both sides of the cofferdam a small amount of dredging will be undertaken to remove any loose or soft silts. The dredged material will disposed off-site to a licenced facility (assumed non-hazardous). One formation prepared the transition/ seal detail to the existing quay wall will be installed as per the detail outlined in the adjacent sketch.



The finished level of the sheet pile in the temporary will be determined following further investigation given the propensity for the Quay Wall to overtop during flood. This will be critical to ensure that when the lagoon lining works commence the area is kept as free from tidal inundation as possible. At the moment we have assumed that the temporary pile will be set at 1m above the existing quay level.

On completion the first level of ties will be installed allowing the first level of 6A backfill to be installed. The penstock pipe and mounting frame will be installed through the cofferdam before continuing to install the upper ties and completing the backfilling operation. Once the backfilling operations have been completed it will be possible to commence dewatering and water control measures for the works within the lagoon area.

On completion of the lagoon lining works the piles will be cut down to the permanent design level and the finishing works such as installation of timber capping beam and surface finishing will be undertaken .

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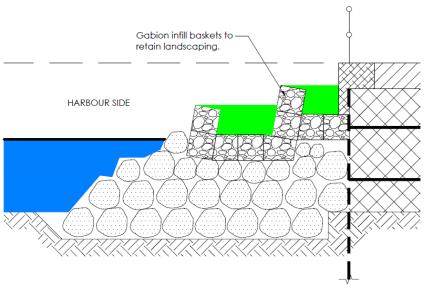
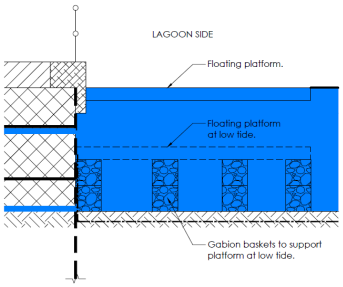
2.3.1 Gabion Basket and Rip-Rap installation (Tidal working)

On completion of the piling installation the river side gabion and rip rap detail will be installed. The pontoon will have a 30t LRE mounted that will undertake the formation preparation by dredging the toe. Approx 60m3 of material will be set aside to be reused as the landscape fill, the balance of dredgings will be disposed offsite to a licenced facility (assumed dredging are non-hazardous).



FINISH TO SHEET PILES ON HARBOUR SIDE OPTION 1: GABION BASKETS WITH LANDSCAPING INFILL
SCALE 1:50



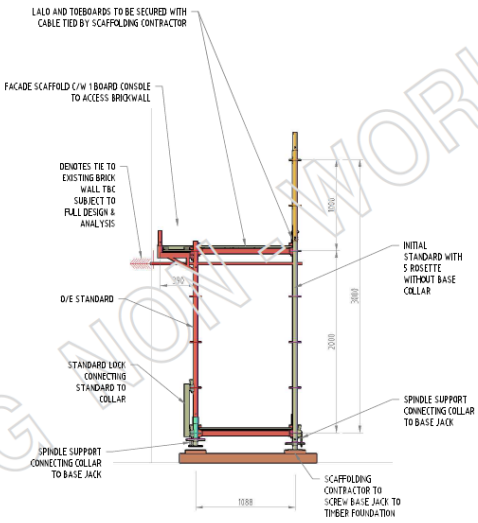
CROSS SECTION B-B
SCALE 1:50

The rip rap stone (assume max dia. 500mm) will be placed using the LRE from the pontoon. On completion the gabion baskets will be installed and the dredged material set aside will be placed to create the intertidal landscape area. All works will be constructed form the pontoon. On completion the pontoon will be demobilised from site.

The gabion detail to the lagoon side will be installed once the first 30lm of lagoon has been lined. The works will be serviced by the LRE from quayside.

2.4 Quay Wall Remedials

During the cofferdam works the monitoring will be established along the existing Quay Wall which will focus predominately on the egress of water from the Quay Wall during periods of low water. This will assist the clients engineers in defining the exact scope of intervention and repair works required.



Prior to any works commencing a trial panel with the proposed mortar specification will be undertaken for approval of the clients architect and engineer.

A two stage scaffold access will be installed along the full length of the quay wall to provide access for cleaning, preparation and all remedial works to the quay wall. The scaffold as will be installed in an area susceptive to flooding so will be tied to the existing wall in the temporary. Once the access has been provided and works to the cofferdam have been completed enabling the lagoon area to be maintained remedial works will commence on the quay wall.

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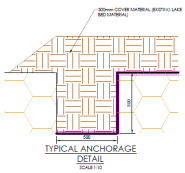
The remedial works will consist of a combination of pointing, stone repairs and replacement and minor grouting. In addition and during the repairs the surface mounted pipe will be installed along the quay wall and connected to the pre-installed connection through the cofferdam. Access for all plant, equipment and labour will be via the dedicated access scaffold and traffic route within the lagoon area. If grouting is required to fill any voids behind the existing quay wall it is proposed this will be undertaken by low pressure resin injection. All works can be undertaken with hand tools.

On successful completion of the Quay Wall remedial works the scaffold will be removed enabling the lagoon lining works to commence.

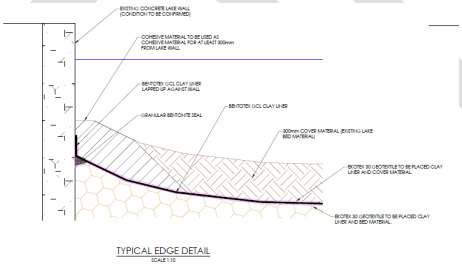
2.5 Lagoon Lining & Ancillary Works

Once the quay wall remedials have been completed the lining works to the lagoon will be undertaken. The lining works will work sequentially in approximately 15m section working away from the cofferdam. The LGP excavator and if necessary amphibious excavator will undertake the initial excavation to formation. All material will be side cast for recovering / placing. Once the formation level is prepared a geofabric layer will be installed prior to the placement of the bentonite liner, a second geofabric layer will be placed immediately over the liner once placed.



Typical anchor detail -

The east tie into the quay wall will be formed in imported class 2a or imported clay to create the wedge against the existing quay wall, the west tie will be formed in pre-dug trench with the liner being placed and wrapped into the trench and backfilled.



Typical tie in detail East side against Quay Wall

The sequence will be repeated until all of the lagoon is lined.

On completion of the lagoon lining and final trimming to finished levels, a stilling test will be undertaken by penning the lagoon behind the operational cofferdam.

SECTION 3

3.0 Specific Risk Management

3.1 Refuelling

Double Bunded Bowsers will be used for the storage all fuels, which will also be kept in a dedicated area within the compound, all site machines and bowsers will have their own Spill kits, in the initial induction a Toolbox Talk will be carried out on spillage procedures and all refuelling will be away from the watercourse, refuelling is always a two-man operation, and LAWS do not allow auto cut offs on fuel lines.

3.2 Public Realm

Advanced warning signage will be installed informing boaters and public access users of the works ahead. The working methodology has been carefully considered to negate the requirement for any PRWO closures. Although temporary short term restrictions will be required. At these times in addition to signage we will employ banksman to control the working area during the site activities. Land & Water will consult with the harbourmaster to gain agreement of the most appropriate management regime.

3.3 Plant movements and working with plant

All plant movements to be under the guidance of vehicle banksman. All plant operators to be CPCS qualified, only authorised essential personnel to be within working area of machines.

3.4 Temporary works

Company Temporary works procedures to be followed, crane pad, unloading / loading areas to be constructed in accordance with temporary works design drawings

3.5 Working on or over water

All operatives will be wearing self-inflating life jackets when within 3m of the water, throw lines and buoyancy aids to be stationed on all marine equipment and at offloading points. As the majority of LAWS work is in and around water all our permanent operatives are trained in water rescue procedures.

3.6 Access and Egress

Operatives will access floating equipment via the safety boat, vehicular access will be via public highway and following the site TM plan, personnel access will be via segregated pedestrian routes within the compound.

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SECTION 4

4.0 Environmental Mitigation

4.1 Planning

Land & Water's core business for the last 25 years has been associated with working on or near to controlled waters and we are fully conscious of the sensitivity of working in these areas.

- Prior to works commencing Land & Water will consult with the Clients appointed ecologist to make sure that any methods of working are designed to minimise disruption to wildlife, for flora, forna AND do not adversely affect any heritage features within the working area.
- Land and Water will ensure that close relations are maintained with the appointed ecologist(s) throughout the works phase and 'should' changes be necessary that change is managed with full stakeholder engagement.
- An Environmental Risk Assessment will be developed and will be approved for implementation prior to works commencing on site.
- LAWS bespoke Aspects and Impacts register, designed to ensure our works are in line with all regulation and legislation surrounding works in these environments will also be used.
- A precondition photographic survey will be undertaken prior to commencement of the works and recorded.

4.2 Consents, Permissions and Consultation

- To be confirmed

4.3 Plant & Equipment

As an environmental contractor Land & Water take its responsibility to address the climate issues we face extremely seriously. We offer Tier 3, 3b and Tier 4 low emission engines in our plant which will be used wherever possible. This latest technology, some using iStop technology reduce emissions and have a 15-20% fuel saving in comparison to older Tier 2 equivalent engines. Land & Water's machines also run on Panolin® Biodegradable hydraulic oil

- Spill kits will be deployed on all machines and within fuelling stations.
- Double bunded bowsers will also be used.
- Only competent and authorised operators will be employed.
- GPS controlled dig systems will be used to ensure the accuracy of dig.
- In areas where fish remain, Dissolved Oxygen levels will be monitored with and action plan in place to introduce aerators should there be signs of distress to fish.

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