

## Works Proposals – Option 3

### Part 1 Site Specific Method Statements – MS03-3

#### **Amenity Area Work Method Statement**

## Introduction

Prior to any works commencing on site a Site Specific Method Statements will be prepared for all the major elements of the work. These method statements will outline precisely how Bam will approach and carry out the works associated with the Bantry Inner Harbour Development – Phase 1 Contract. These method statements will be submitted to the Employers Representative for approval, work will not commence prior to the relevant method statements being approved.

The method statements will be prepared by the Project Manager Collins Connolly and the Site Engineer Seamus O’Sullivan, however the various other members of the site management team will be asked to contribute to the relevant sections of the method statements as required. The method statements will be prepared in line with the Works Requirements, Specifications, Guidance Documents and Consultations meetings with various other stakeholders.

While the more specific in-depth method statements will be prepared once we get to site, below are the overall method statements which will outline our general approach and methodology to the Bantry Inner Harbour Development – Phase 1 Contract.

#### **Amenity Area Work Method Statement**

## Introduction

This method statement incorporates Bam overall approach to the project and will serve to outline our methodology for carrying out the various elements of the Amenity Area Works. Prior to any works commencing on site more comprehensive and detailed, task specific method statements will be prepared by Bam for each element of the works.

## Scope of Works

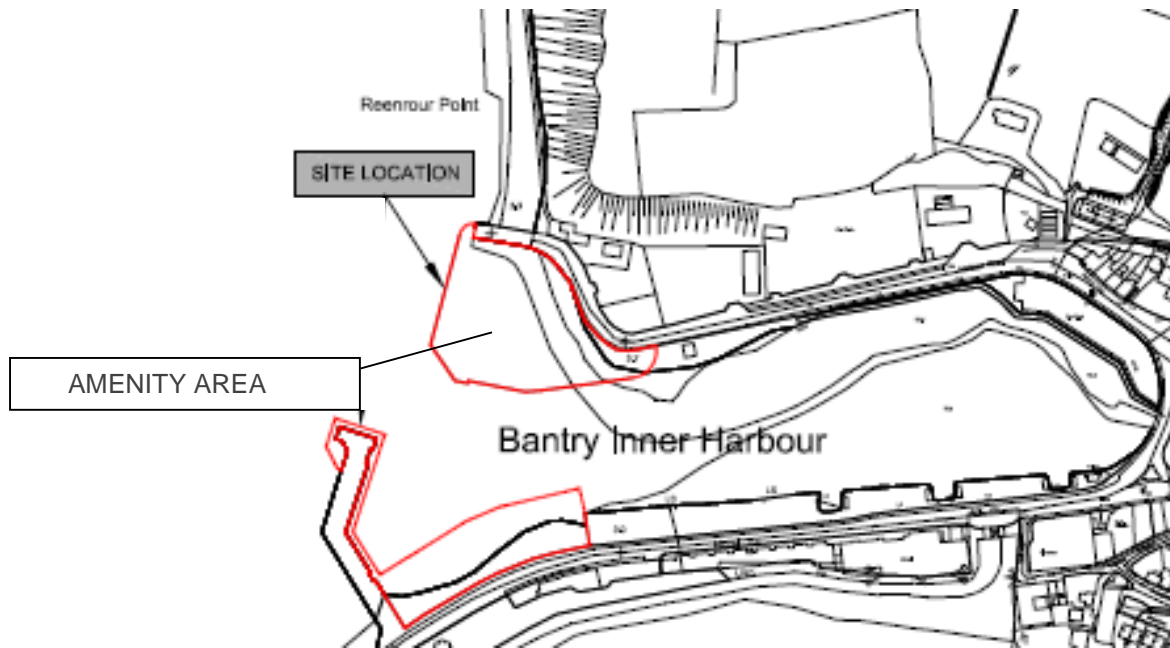
The works will consist of the following:

- Proposed Plant.
- Revetment construction.
- Excavation and Treatment of Seabed Material Landward of Revetment.
- Core Filling.
- Landscaping.
- Drainage works
- Revetment Crest Seawall

## Location of the Works



Location Map



**Site Layout Map**



*Picture: Looking North from N71 towards Proposed Amenity Area*



## Proposed Plant

The following resources will be utilized for the works described in this method statement:



Picture: BAM long reach excavator being used to place the core material on a previous Bam project

Item	Activity/ Roles	Quantity [nos.]
Aoibheann Spud Leg Dredger with long reach excavator (65t)	Dredge overburden and rock	1
Material transfer barge (hopper)	Transport dredged material to shore	2
Workboat	Move material transfer barge	1
Long reach excavator (CAT 365)	Rock armour placing	1
35t Excavator with Allu PMX500 power mix mounted on excavator	Adding of cement to material to stabilise the dredged material and Load trucks with stabilised material	1
Allu PF7+7 power feeder	Storage of cement that is added to material during stabilisation process	1
Long reach excavator with grab	Offloading material transfer barge	1
Testing Equipment	Testing of materials	1
Vibration and noise monitoring equipment	Monitoring the works	1
Safety boat	Works over water	1
Lighting Tower	Site Lighting	1
D6 dozer	Spread material	1
CAT 330 excavator	Place core material	1
Heras Fence	Secure the handling and storage area.	
Site Accommodation	Provide welfare facilities and office	
Generator	Providing power	1
Survey equipment	Survey	1
Tipper Truck/ Volvo A25	Moving of material on site	2
Handrailing	Fall protection at water edge	

Further equipment is also available from our subcontractors and sister companies in the BAM group.

All mechanical plant will be in good working order and subject to a regular maintenance regime. Only suitably qualified and experienced personnel will be allowed to operate plant and equipment.

All Vehicles will be fitted with reversing beacons and a flashing light and will be directed by a banksman. All plant certification will be checked by the BAM Civil Safety Officer prior to commencing works on site. A register of all plant and equipment checks will be kept on site for the duration of the project.

All marine plant on the project will be fitted with VHF radios which will allow them to be contacted at all times. All marine plant will be fitted with the internationally recognised display lights and signals as required by International Collision Regulations as per Appendix 1/19.

## Revetment Construction

The revetment will be constructed starting in September 2016 and in the following sequence:

### Stage 1

- Material for the core will be reused from the temporary causeway (Quayside reclamation works) or imported material depending on progress, which will be deposited to form the core – wide enough to allow construction traffic to use it while the area is completed.
- The geotextile membrane will be placed along the inner face of revetment to allow material to be in filled against it.
- There will be temporary rock armour placed to the seaward face of the core for protection, which will be removed and reused as the final front face is shaped to the correct line and profile.

### Stage 2

- Once the amenity area is closed off by the initial phase, an excavator (long reach) will start at one end and work in approx. 10-12m sections. Removing the protective rock layer,
- The long reach excavator will dig out the toe for rock armour.
- The geotextile membrane will be placed along the toe; rock armour will be set to the correct profile up to a level - approx. 1m above bed level.

### Stage 3

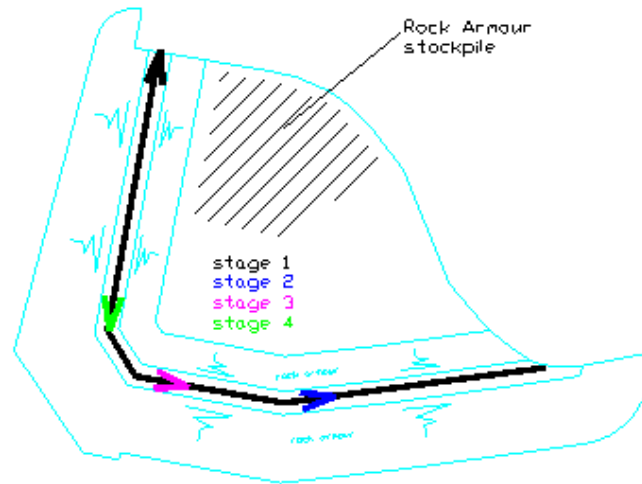
- The rock armour (under layer – and primary) is then placed to the correct profile up to the level of the core material, which will allow the final shaping of the revetment core.

### Stage 4

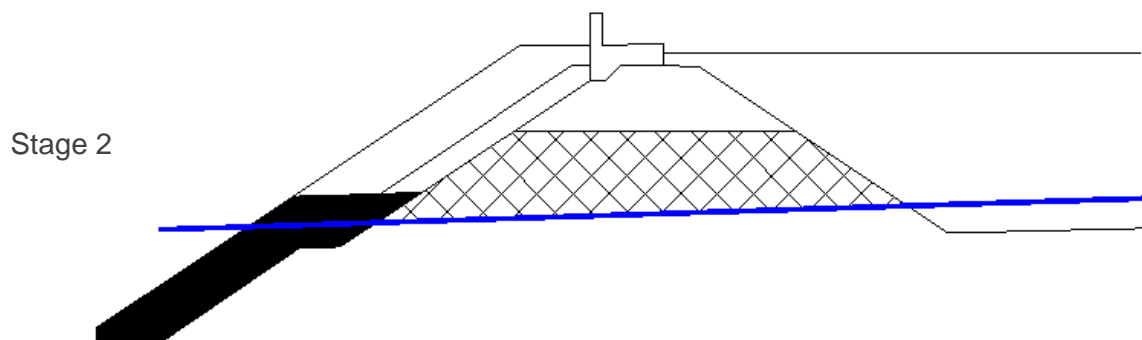
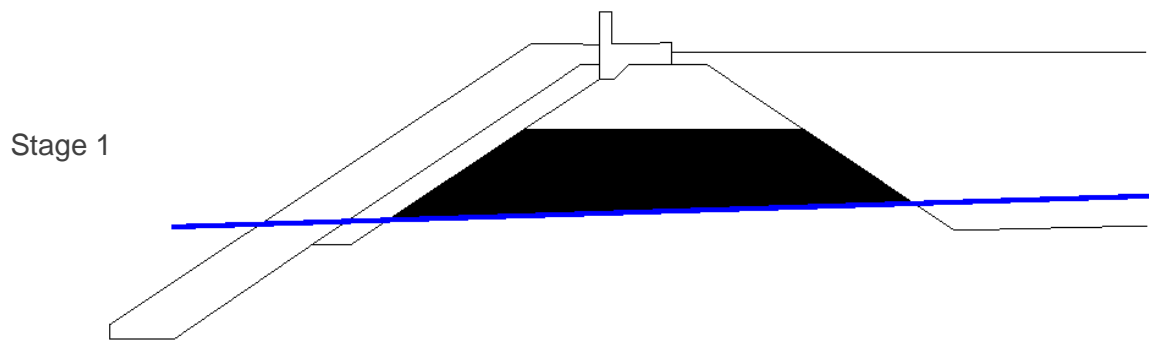
- The remaining core material is placed, keyed-in and compacted.
- Geotextile, under-layer of rock armour and primary rock armour are then placed to the correct profile.

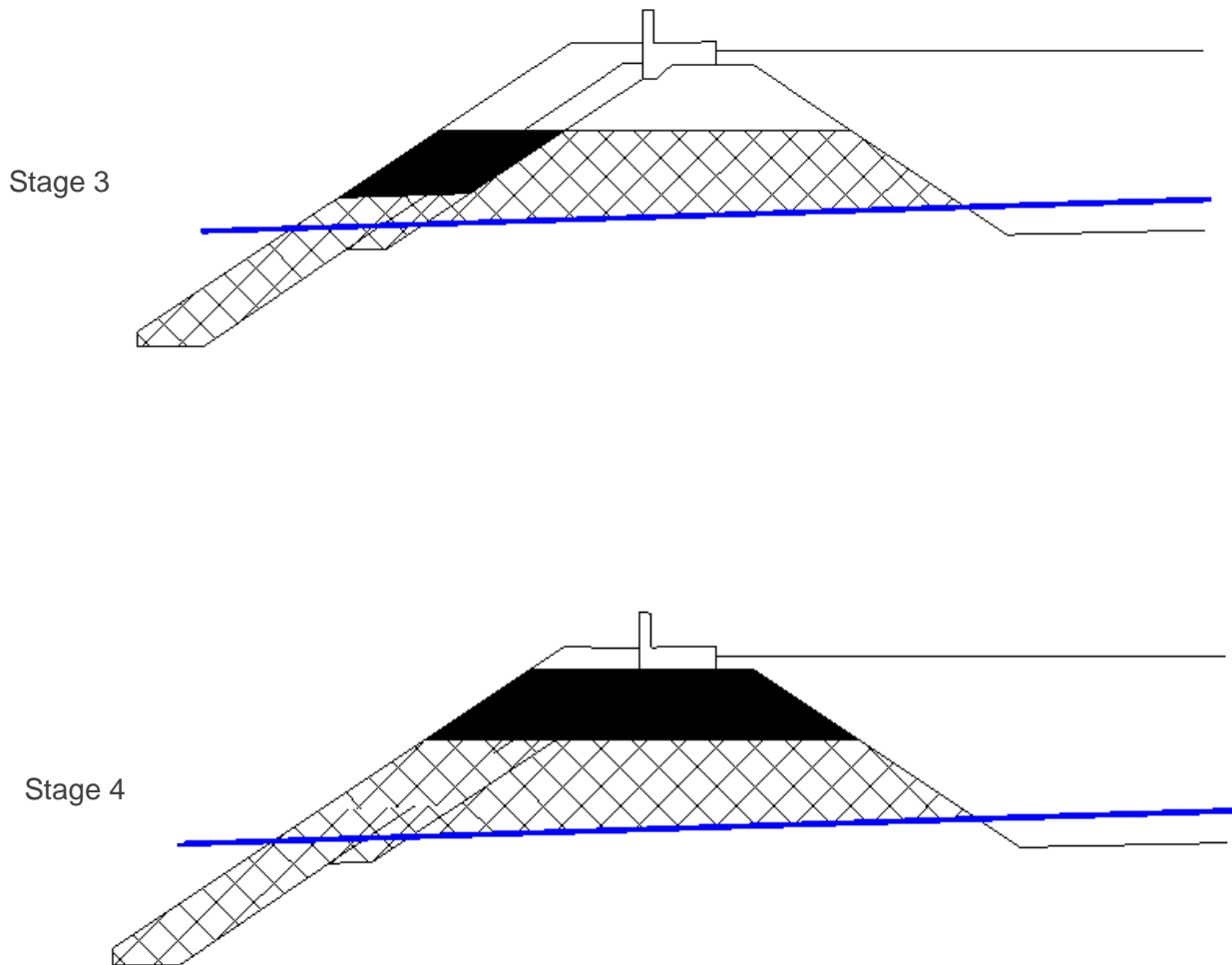
### Stage 5

- The parapet retaining wall will be constructed after the amenity area is filled and stabilised, with final rock armour being placed at this time.



Sketch: Sequential Stage Order for Revetment Construction





*Sketch: Construction Stages for Revetment Construction*

In order to construct the new revetment a source for the core material and rock armour that will be imported will have to be approved by the ER. The rock armour and core material for the revetment will comply fully with the requirements of Appendix 6/70 of the Works Requirements and will only be imported from an approved source. Once the source has been approved the material will be continuously tested to ensure it is fully compliant.

The rock armour will be transported to site by trucks and stored on site in the amenity area; the core material will be transported to site by truck initially. Any core material utilised from the dredging/stabilisation process will be transported by barge, off loaded into A25 dumpers and tipped into its final position.

To accommodate the material handling/ transfer at the amenity area a temporary berthing dock will be constructed as part of the initial stage, this temporary dock will be attached to the revetment and removed once the works are complete.

The line and level of the new revetment will be set out and continuously monitored by Bam's site engineers. The placing tolerances will comply fully with Appendix 6/70 of the Works Requirements.

Geotextile shall be placed in accordance with the relevant manufacturer's instructions, and in a manner that ensures that it is properly anchored in accordance with the details shown on the drawings.





*Picture: Placing of geotextile membrane and Rock Armour under layer to protect the core material on a previous Bam project*



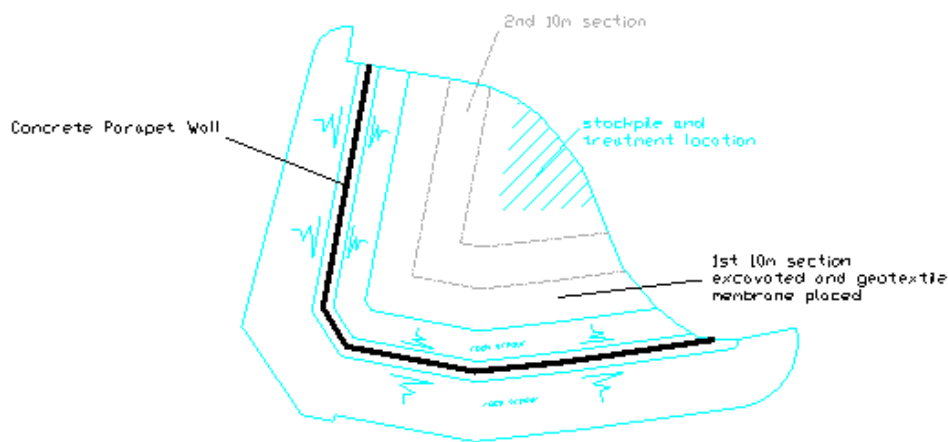
*Picture: Sequential placing of Rock Armour to protect the core material on a previous Bam project*



## Excavation and Treatment of Seabed Material Landward of Revetment

Once the first stage of the revetment construction is complete, the amenity area is fully closed off to the sea; work will start in the amenity area. The entire area to be excavated (1m of seabed) will be swept for wires, cables tires and other small debris, which will be collected and disposed off-site to an appropriately licenced facility.

The 1m of seabed that is to be removed will be excavated working from the revetment back towards the land in 10-12m sections, with the excavated material being stockpiled and treated to stabilise it before it is reused in the filling of the amenity area.



*Sketch: Sequential excavation of 1m seabed landward of revetment*

There will be a bund placed around the stockpiled area to allow the material dewater and be treated ensuring no leaching of any contaminants to the area to be filled.

The material will be stabilised with cement (the exact % will be determined by trial mixes) to the design mix which will be agreed with the RE prior to the full scale dredging programme proceeds.

This initial 1m of seabed that has been treated will then be placed on the geotextile. This sequence will continue until the entire area is excavated, treated and placed on geotextile membrane.

Once this is done and the design mix has been approved (tested to confirm it meets the design criteria) the main dredging can commence and the filling of the amenity area started.

It is intended to fill the area by loading onto A25 dumpers from the barges at the temporary berthing dock and tipping it into the area to be filled.

The deposited material will be brought up in 1m lifts and stabilised in-situ by using the stabilising system described below.

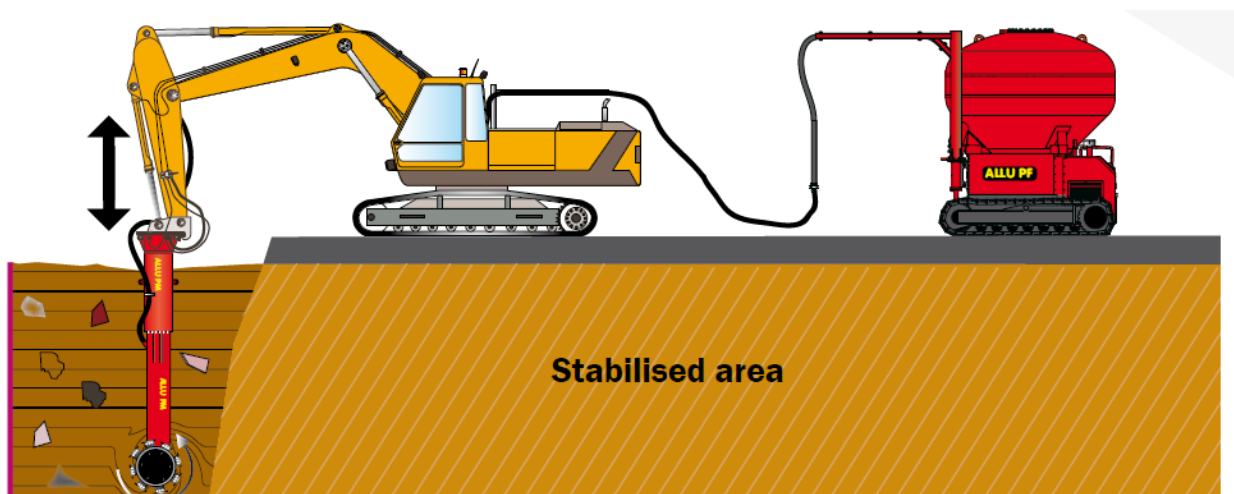


*Picture: Stabilising of material with cement by use of special equipment attachments to excavator.*

The Stabilisation System consists of a Power mixer, a Pressure feeder and a control system which is attached to an excavator. This system is mobile and easily mounted on an excavator which makes it very suitable to this project.

The excavator arm with mixer drums penetrates the material to be stabilised, the drums of the mixer move in a coordinated manner in all three directions at once. The cement is delivered to the area through a feeder pipe by compressed air directly to the centre of the drums.

The control system measures, controls and reports the cement content as it is working, while also recording the information which is then used as part of the quality control/ assurance records.



*Diagram: Stabilising of material with cement by use of special equipment attachments to excavator.*

## Core Filling

The imported material will come from an approved quarry and it will have to be approved by the Engineer prior to importing to site. Once the source has been approved the material will be continuously tested to ensure it is fully compliant with the requirements of Appendix 6/70 of the Works Requirements

The material for the core will be from temporary causeway (quayside reclamation) and imported to construct stage 1 (seal off amenity area) it will be transported to site by trucks, tipped then placed by the excavator into its final position.

The remaining fill material for the core will consist of imported material and reused (approved) material from the dredging operation, depending on progress.

## Landscaping

Once the main filling and treatment/compaction of the amenity area has been completed to the required levels the geotextile membrane will be placed in accordance with the relevant manufacturer's instructions ensuring the proper laps/ jointing detail are followed.

This operation will be coinciding with the construction of the in-situ reinforced concrete parapet wall that must go along the full length of the revetment. In order to maintain sufficient working space a 5m strip parallel to the wall footing will be left until the wall is complete. This 5m strip will be used to install the drainage and then this strip can be top soiled and seeded.

The Class 5A material (topsoil) is to be 300mm deep, it will be prepared and sown by a specialist landscaper with the approved grass mixture and fertilised to ensure it is fully compliant with the requirements of Appendix 6/8 of the Works Requirements.

## Drainage Works

The drainage for the amenity area consists of 100mmØ perforated land drainage pipes, which runs along the perimeter to outfall pipes with tideflex valves at each end. There are also 90mmØ pipes cast into base of parapet wall to drain the footpath.

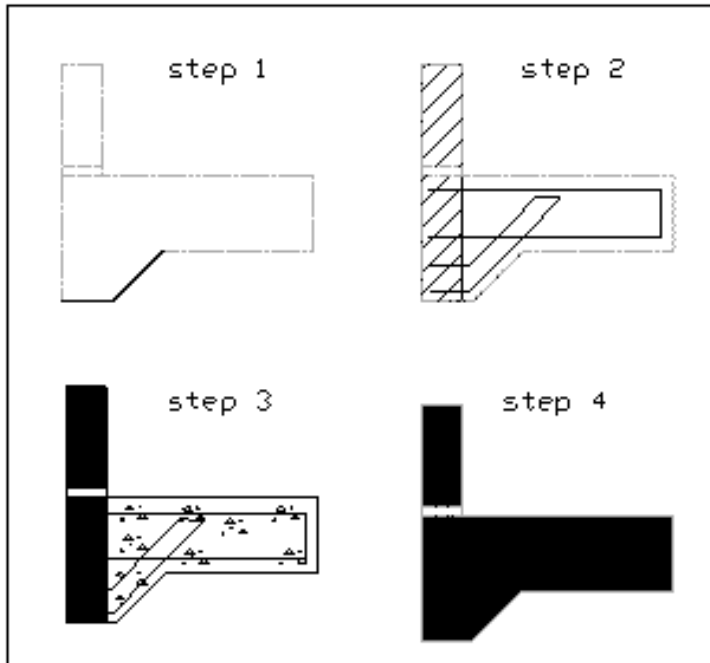
As described above, this operation can only be started once the parapet wall is finished and the amenity area filled and stabilised. The geotextile will be laid along the formation and up against the footing for the wall. The perforated drainage pipe, geotextile and drainage stone (clause 505) is then installed with the geotextile lapped over the 100mm stone surround. The topsoil is then finished over the pipe to the correct levels and fertilised and seeded.

The outlets and tideflex valves will be done when the end sections of the wall are being constructed as this will allow room to adjust the rock armour locally on the revetment.

## Revetment Crest Wall

This wall will be constructed after the revetment is completed – core material and rock armour, with some of the outer armour stockpiled nearby so it can be finished against the wall at the end.

The intention is to have a 5m working width to the land side of the wall footing to allow the delivery of the precast units, steel reinforcement, timber shutters and concrete.



## Sequence for construction wall

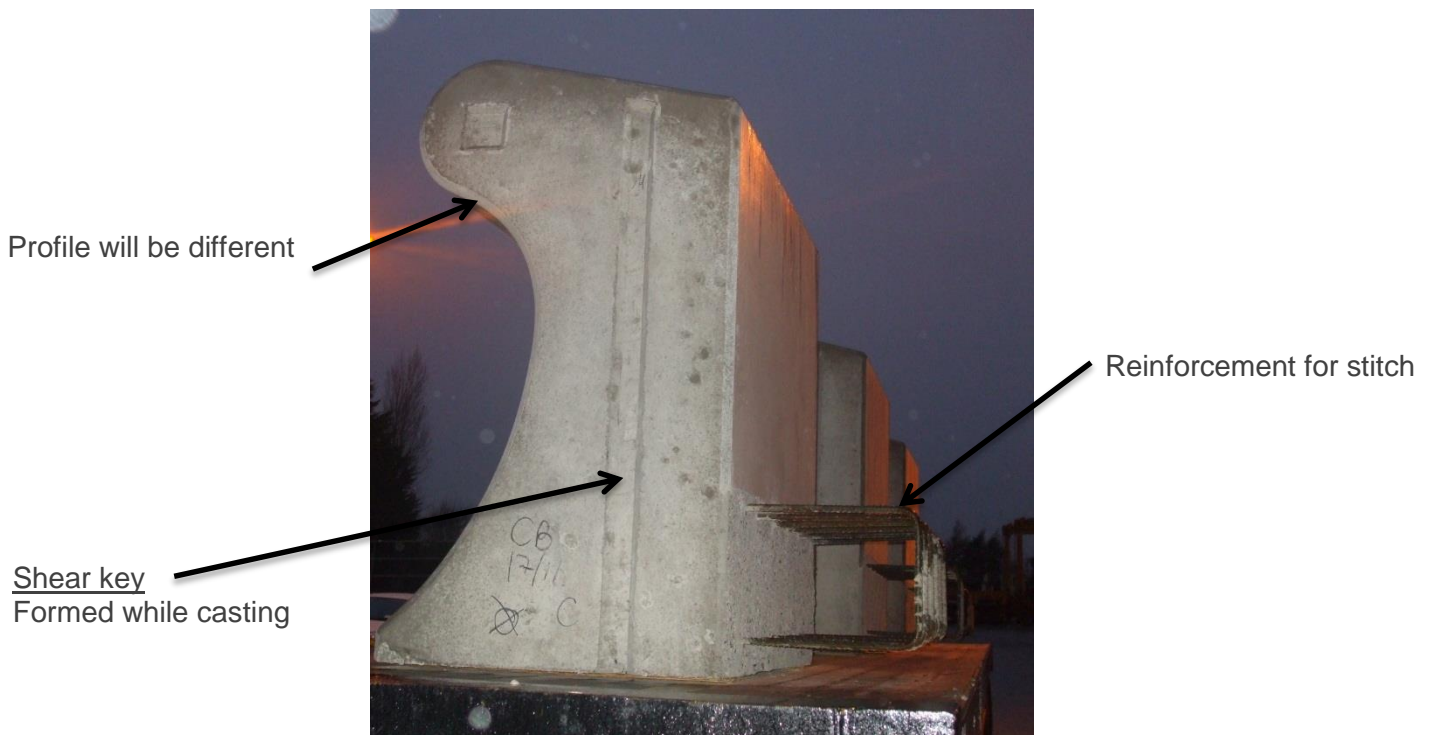
Step 1 – excavate the toe and blind

Step 2 – drop in precast unit, shim and align it to correct line & level

Step 3 – splice three units with reinforcement, shutter back of footing and pour

Step 4 – pour shear key & finishes

The reinforced parapet wall will be a precast unit made off site in a specialist precast yard in 2m sections and delivered to site for installation. There will be reinforcement protruding which will be used to splice the different sections together once in position. A concrete stitch will be poured at the back of the wall to tie all the units together and form the footpath. A shear key will be poured to join the vertical sections of the wall before a sealant suitable for the conditions is applied to the joints.



*Picture: precast parapet wall units used on a previous BAM project.*



## Safety

- Risk assessments have been carried out and are included in the Health and Safety Plan. The Health and Safety Plan is included in Part 3 of the submission.
- All work will be carried out in accordance with the Health and Safety Plan for the site.
- The site operates an induction procedure for personnel prior to commencing work on site.
- P.P.E. will be worn by everyone involved on this project at all times to include a minimum of high visibility vest, hard hat, safety glasses and safety boots.
- All plant will be in good working order and equipped with yellow flashing beacons

## Programme of Works

Refer to construction program as included in Part 2 of this submission



Picture: Screenshot of Amenity area works from the programme

## Quality and Environmental management

The project Quality Plan will be implemented after being approved by the ER and the inspection and test plan will be adhered to rigidly. A copy of the Quality Management Plan will be kept on site. Seamus O'Sullivan will be the person with responsibility for quality control. Site audits will be carried out to ensure compliance with the Quality Plan. Periodic company audits will be carried out to ensure QA standards are being maintained on the project.

All works will be undertaken in accordance with the Site Specific Environmental Management Plan and the Waste Management Plan. These plans have been included in Part 5 of the submission. The main environmental impacts and considerations associated with the works are as follows:

- Waste Management: Waste management will be as specified in the site WMP
- Water Pollution: No contaminated water to be discharged into the harbour.
- Noise: All plant and machinery used on site will be serviced regularly to avoid excessive noise. Noise levels on site are not expected to exceed the legal but where necessary, mandatory warnings signs shall be erected informing all when ear protection is required to be worn.
- Protection of Watercourse: The water course shall be protected from pollution, by ensuring that generators, pumps etc are placed in drip trays. Spill kits shall be located adjacent to the watercourse and clearly identified. Spill kits shall also be placed in all machines. Details of procedure for dealing with oil spillages and procedure for protecting water courses are contained in BAM Environmental Management Plan
- Hazardous Substances: All hazardous substance will be stored in the hazardous store and all generators will be placed on a drip tray at all times.
- Washing of concrete trucks to take place at a designated concrete wash out area.

## Plant Equipment and Certification Required

The following resources will be utilized for the works described in this method statement:

- Excavators
- Barges
- Roller
  
- Mobile crane
- Concrete pump
- Teleporter/35 ton crane

All mechanical plant will be in good working order and subject to a regular maintenance regime. Only suitably qualified and experienced personnel will be allowed to operate plant and equipment.

All Vehicles will be fitted with reversing beacons and a flashing light and will be directed by a banksman. All plant certification will be checked by the BAM Civil Safety Officer prior to commencing works on site. A register of all plant and equipment checks will be kept on site for the duration of the project.

All cranes will be fully certified, and all lifting gear will also be fully certified.