A98 Banff Bridge Marine Licence Anticipated Method Statement (Pre-Contractor Appointment)

A98 Banff Bridge Scour Protection
CON2500416 / MS01 / P01

16/10/2024

Document Control Sheet

REPORT TITLE:	A98 Banff Bridge Marine Licence Anticipated Method Statement (Pre-Contractor Appointment)
REPORT NUMBER:	MS01
PROJECT NAME:	A98 Banff Bridge Scour Protection
PROJECT NUMBER:	CON2500416

STATUS/AMENDMENT	PREPARED	REVIEWED	APPROVED
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1. Introduction

1.1. Introduction to document

This Anticipated Method Statement document has been created to support the Marine Licence for the A98 Banff Bridge Scour Protection works by Amey Consulting prior to the appointment of the Contractor for the works.

Disclaimer: This Anticipated Method Statement was written following completion of the detailed design of the proposed scour protection works to cover the eventualities the design team foreseen to be viable. However, in accordance with the Construction (Design and Management) Regulations 2015 the manner in which the works are completed, and the design of all temporary works will be the prerogative of the Principal Contractor. As a result, the number of construction stages, the type of temporary works to create dry working area / area of reduced water levels and access tracks cannot be confirmed until the Principal Contractor is appointed following the tender process. Following the creation of the Principal Contractors method statement for full transparency these can be shared with the Marine Directorate if required.

1.2. Project Background

A98 Banff Bridge is a 125m long seven span, Category A listed masonry arch bridge, located East of the town of Banff, Aberdeenshire. Records suggest scour has been occurring at A98 Banff Bridge since before the 1980's, in the form of the undercutting of piers and riverbed degradation. Despite historic efforts, scour and erosion have persisted around the structure. Leading to the requirement for the proposed works to safeguard the bridge.

1.3. Scope of works

Proposed scope of works and licensable marine activities include:

- Installation of temporary access tracks,
- Installation of temporary works,
- Removal of the existing rock riprap located around the pier revetments and abutments of Banff Bridge,
- Reinstatement of any undercutting / voids uncovered benefit the existing concrete revetments with underwater suitable concrete,
- Excavation of the riverbed to a depth of 300mm and preparation of the formation level to smooth and remove stones over 100mm,
- Installation of a 300mm rock mattress apron and geogrid protective layer. The all-terminations and edges of the mattress will be installed to be flush with the existing riverbed (no upstands will be permitted,
- Fixing of new rock mattress to the riverbed with ground anchors. Where the mattress passes over historic concrete repairs around the pier revetments stainless steel dowels will be used to fix the mattress in place. Where the concrete is unsuitable for dowel, the concrete will be cored to allow ground and anchors to be installed. In areas where the distance between the upper face of historic concrete repairs and the proposed mattresses formation level is less than 100mm, a 25mm thick marine and underwater suitable cross linked, closed cell polyethylene sheet material shall be installed.
- Construction of new rip rap using suitable site won rock over 900mm diameter and a geotextile membrane,
- Removal of temporary works,
- Removal of temporary access tracks.

2. Method Statement

2.1. General methodology for working in / adjacent to water

- It is the Principal Designer's preference for the works to be carried out using dry working areas / areas with controlled water depths. This is required to reduce the risk or working in water and improve the quality of the permanent works.
- Works shall be carried out in a way that the temporary access and any temporary works do not cause further scour during construction. In the event that the temporary works/access could cause further scour during the works, then temporary scour protection shall be implemented in the areas where this is expected to occur prior to the implementation of the temporary works/access.
- All temporary works shall be designed, certified and installed by the Contractor.
- Weather reports, tidal predictions and the SEPA gauge station "Deveron @ Muiresk" must be regularly reviewed and the Works planned around large flow events. All necessary provisions shall be made by the Principal Contractor to ensure ease of escape for site personnel should the need arise. The Contractor shall provide and implement all relevant provisions of safe working practices to all relevant legislation. During overtopping events, All Works shall be stopped, all site personnel and plant removed as necessary, until such time as the flood peak has passed and it is deemed safe to re-enter the area and commence Works.
- Where possible, individuals trained in water safety should be utilised.
- Lone working must not be permitted.
- Appropriate Personal Protective Equipment such as buoyance aides and safety lines shall be used.
- An emergency plan must be in place in the event of someone falling into the watercourse / being washed off their feet.
- Silt nets must be installed downstream of the work area prior to any work taking place in the water. At any point if silt becomes evident, further silt nets must be installed downstream of where it appears.
- All machinery used in the watercourse shall be subject to appropriate biosecurity measures.

2.2. General methodology for the prevention of watercourse pollution

- Biosecurity measures shall be taken including the cleaning of all plant, temporary works materials and equipment required for the works prior to their arrival on-site.
- A silt net shall be installed downstream of the location of the works prior to works commencing. If silt becomes apparent at any point during the works, then a further silt net shall be installed downstream of where it is appearing.
- The use of aquatic friendly oils, grease, fuels shall be used where possible.
- All plant and equipment shall be refuelled in designated areas a minimum of 20m away from the water's edge, drains and any road gullies. Drip trays must be utilised. Spill kits shall be available at all times with all site personnel trained and competent in their use.
- Each mobile plant will contain a spill kit with sand, earth or commercial products for containment of spillages.
- Cement and concrete are to be sited a minimum of 10m away from any watercourse or surface water drain to minimise the risk of run off.
- All site personnel shall be briefed in water pollution prevention.
- Any storage of equipment or materials must be done at a suitable distance from the watercourse in out with areas likely to flood.
- The following of an Invasive Non-Native Species (INNS) Management plan.
- All works within proximity to waterbodies/watercourses must follow best practice measures consistent with Scottish Environment Protection Agency's (SEPA) General Pollution Prevention (GPP) documentation
- All works within waterbodies/watercourses must follow best practice measures consistent with Scottish Environment Protection Agency's (SEPA's) General Pollution Prevention Works and maintenance in or near water (GPP5), Silt Control Guidance and Engineering in the Water Environment Good Practice Guide documentation.
- Prior to works commencing, all operatives will be briefed on SEPA's Guidance for Pollution Prevention (GPP) documents (particularly GPP 1, GPP 2, GPP 5, PPG 6, GPP 8 and GPP 22).

2.3. Installation of silt nets

A silt net shall be installed downstream of the location of the works prior to works commencing. If silt becomes apparent at any point during the works, then a further silt net shall be installed downstream of where it is appearing.

All silt nets shall be installed in a manner which allow fish will still be able to navigate up or down the water course such as a slalom type distribution or similar.

2.4. Installation of temporary access track

If the Contractor choses to adopt a construction sequence including more than two phases temporary access tracks will be formed to provide access to the dames off areas.

The designer's preference is for the access tracks to be formed using pre-cast concrete culverts.

Methodology:

- Access tracks shall be installed at low tide when viable,
- Access tracks to be constructed from the riverbank to the proposed dammed area,
- The riverbed shall be re-graded to form a level formation with imported fill used to fill low areas / voids,
- Pre-cast concrete box culvert units lifted into place by an excavator,
- A layer of imported granular fill and/or steel plates / bog mats placed over the culverts to provide a safe running surface,
- Temporary edge protection installed,
- The access shall be extended or shortened as required to access all phases,
- Temporary scour mitigation products such as rock rolls, rock mattresses, scour mats and rip rap maybe be used to prevent the scouring of the access track,
- The access track will be removed from the river to the riverbank.

Alternative methods:

1. Creation of an earth access track using imported granular fill and layers of geotextile membrane, with culverts through the access track at regular intervals.

2. Use of a pontoon / floating road.

3. Use of a barge.

2.5. Installation of dams

Dams will be utilised to create dry working areas or to limit the depth of water in live working areas. It is the designer's preference for works to be undertaken using 2 or 3 phased dry working areas as shown on drawing numbers: CON2500416-DR-0100-053 or CON2500416-DR-0100-054, utilising a metal "A" frame and waterproof membrane arrangement.

However, the number of dams will be the Principal Contractor's prerogative. Prior to the installation of the temporary works the Principal Contractor must undertaking catchment studies and / or hydrological models as required to understand the extents of flooding and to ensure temporary work will not cause flooding and further scour/erosion.

Methodology:

- Access the proposed area of damming from the riverbank or access track,
- The riverbed shall be re-graded to form a level formation with imported fill used to fill low areas / voids and rocks removed,
- install metal "A" frame sections linked together to form the basis of the temporary dam positioned to form sufficient space for the installation of the proposed works and working areas,
- Installation of any required flumes to allow water to pass through the dammed area if the Contractor deems fit,
- Install waterproof membrane over the "A" frame. The bottom sections of the membrane will be held in place by sandbags, filled with clean washed gravel / rock / rock mattress units,
- Once the Dam is complete a fish rescue will take place by a specialist sub-contractor,
- Once free of fish the dammed area will by empties of water using a pump to over pump water from within the dam back into the river Deveron,
- If the dam is causing scour temporary scour protection measures will be install such as rock rolls, rock mattresses, scour mats or rip rap,
- Once the phase of works within the dam has been completed the dam will be taken down in phases to prevent the rapid influx of water,
- Any riverbed undulations caused by the dam will be re-graded / reinstated with granular fill.

Alternative methods:

Formation of dam

1. Dam formed from sheet piles,

2. Dam formed from granular material / bulk bags / rock,

3. Dam formed from Closed board fencing.

Number of phases

1. One phase with multiple flumes to allow water to flow through the dammed area,

2. Two phases split at the central point of the river

3. Three phases split evenly into thirds across the river cross section,

4. Four phases,

5. Five phases,

6. Six stages, each around a pier

Working methods

1. Only partially dewatering the dammed area to allow working in a controlled water depth,

2.6. Removal of rip rap and excavation of the riverbed

The rock rip rap around the piers and abutments will be removed in accordance with the construction drawings. Excavation may be required to remove rock that has sunk into the riverbed.

- Access the area of rip rap via access tracks and dams,
- Prior to the removal of rip rap, the area will be inspected for signs of otters by a qualified Ecological Clerk of Works,
- Remove rip rap using an excavator and place into a dumper / articulated dumper,
- Transport the rip rap stone to designated on site storage area to be sorted into size,
- Stockpile rock to be re-used on site,
- Installation of an otter fence around material to be stored on site for prolonged periods,
- Surplus rock will be taken off site to a location selected my Aberdeenshire Council via road haulage.

Alternative methods:

1. Working without the use of dewatering utilising time working at low tide using specialist plant and commercial divers.

2.7. Reinstatement of scour under plinths / revetments with concrete

Any discovered areas of undercutting below the existing revetments around the piers will be reinstated with underwater and marine suitable C28/35 concrete.

- Access the area of rip rap via access tracks and dams,
- Excavation of loose material,
- Compaction of formation level,
- Installation of temporary formwork in the form of steel shuttering,
- Pouring of concrete using a concrete pump with the nozzle in the base of the excavation to displace water if required. Alternative, directly from a mixed / dumper / excavator bucket if no water is present in the excavation,
- Vibration of the concrete as required,
- Surface preparation with hand tools,
- Allow the concrete a minimum of 48 hours to set or longer as required,
- Removal of concrete shuttering.

Alternative methods / products:

Working

1. Working without the use of dewatering utilising time working at low tide using specialist plant and commercial divers.

Products

1. Underwater suitable concrete filled sandbags (Concrete Bagwork) held in place with reinforcing bars maybe utilised for smaller repairs.

2.8. Installation of rock mattress and fixings

1.9m x 1.0m x 300mm rock mattress units will be installed withing the river Deveron and tethers to form a continuous rack mattress apron to protect A98 Banff Bridge from scour.

- Access the working area tracks and dams,
- Trial pits and anchor trial will be undertaken at the earliest possible stage of the project to allow the Contractor to design the ground anchors,
- Removal of large boulders and excavation of the riverbed to a depth of 300mm,
- Excavated material will be processed to provide a small quantity of material for re used on the project,
- Surplus material will be taken off site via road to a licenced waste facility,
- Material stored on site for prolonged periods will have otter fences constructed around them,
- Preparation of the exposed formation surface including smoothing / re-grading of the exposed surface, Removal of stones over 100mm, excavation and reinstatement of any soft spots and compaction of formation level,
- Transport rock mattresses to the works area with dumpers from the storage areas,
- Unload and phased positioning mattress units with excavators,
- All edges of the mattress will finish flush with the riverbed / riverbank with no steps permitted,
- Teather rock mattress units together by hand,
- Install geogrid protective layer to be installed over and 1m under the edges of the mattress.
- Fix the rock mattress units in place using ground anchors installed using excavators with adapted hydraulic breakers,
- Load locked anchors using a hydraulic ram and install top plate and load nut,
- Above areas of historic concrete repairs stainless steel dowels will be fixed into the existing concrete using resin. The holes for the dowels will be hand drilled.
- Closed cell polyethylene sheet material will be installed between the mattress and concrete repairs were necessary to provide abrasion control,
- Where the concrete is of insufficient quality for the dowels it will be cored to allow the installation of ground anchors through the concrete.

Alternative methods/ products:

Working

1. Working without the use of dewatering utilising time working at low tide using specialist plant and commercial divers.

2. If ground conditions allow, manually driven ground anchors installed using handheld post drivers may be utilised.

Anchors

1. The ground Anchors are a contractor designed element and are subject to change. All metal components will be stainless steel. However, the final approach may consist of plastic anchor plates.

2.9. Installation of rip rap / reinstatement of fish pool

The proposed rip rap will be formed using suitable site won rock over 900mm diameter and a geotextile membrane to act as a filter layer. Any areas of fish pool modified / removed during the works out with the extents of the new mattress with be reinstated to its original footprint using 700mm to 900mm rock.

- Weather reports, tidal predictions and the SEPA gauge station “Deveron @ Muiresk” must be regularly reviewed and the Works planned around large flow events, where possible the work will be undertaken at low tide,
- Rip rap will be visually inspected to check minimum, maximum and average stone sizes.
- Rip rap will be transported from the site storage areas to the excavator using dumpers / articulated dumpers,
- For the rip rap only, a geotextile will be install using an excavator,
- The geotextile will be held in place with rocks,
- Rip rap will be installed from the access track / riverbank using an excavator,
- The rip rap will be installed to be interlocking,
- The termination of the rip rap will have a 1:4 slope,
- The fish pools will be reinstated to the Project Managers / supervisors satisfaction to a similar depth to the original,
- Following the installation any surplus rock will be removed from site via road to a location specified by Aberdeenshire Council.