



Construction Method Statement

Stormwater Culverts



Project Information

CMS No: 4249-CP-0001

Rev: B

CMS Title: Stormwater Culverts

Project No: 4249

Project Name: Mt Crosby Bridge

Project Site Office Address: Mt Crosby Bridge, Allawah Road, Chuwar

Principal Contractor: BMD Constructions

Name of Safety Officer: Peter Douglas

Controls and Monitoring: Controls and monitoring will be as nominated in the appropriate WMS, EWMS, ESCP and/or ITP

Document Version Control

Revision No.	Revision Date	Details of Revision	Approved By
A	02/06/2022	Original Submission to Seqwater	Nicholas Maher
B	22/06/2022	Seqwater review comments	Nicholas Maher

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1 Introduction

This Construction Method Statement (CMS) governs the process and procedure for the construction and protection of stormwater culverts on the Mt Crosby Bridge Project. Reinforced Concrete Pipes (RCP's) culvert structures will be installed over the project duration

This document outlines the individual team members and their responsibilities for this construction procedure; identifies the materials and equipment which will be used; illustrates how the documentation shall be carried out and how the activities will be controlled and recorded.

2 Staff Responsibilities

2.1 Senior Project Engineer

- Work with the Project Engineers and Site Engineers, Superintendent and Foremen to identify the correct level of resources required. Communicate these requirements to the Project Manager.

2.2 Project Engineer / Site Engineer

- Responsible for the delivery of specific elements of works for the Construction Period of the Project
- Work with Foremen to plan and coordinate medium- and short-term activities based on the 2-week look-ahead program, and ensure that resources (plant, labour, material, Subcontractors) are optimised across these activities
- Coordinate with foremen the procurement of materials and plant etc. and order material deliveries.
- Coordinate all quality assurance requirements such as conformance testing and product approvals.

2.3 Seqwater/Representative Works Inspector

- Individual activities in the ITP cannot commence until the Works Inspector has released the hold points.

2.4 Foreman

- Pre-planning of work activity to be performed
- Evaluation of site personnel and resources to perform the activity
- Monitoring the activity in terms of quality, safety and environmental issues
- Inducting personnel onto the WMS for the activity
- Conducting daily pre-start meeting with personnel involved in the activity
- Daily management of personnel and resources required for the activity

2.5 Employees / Workers

- Responsible construction of specific elements of construction works as directed by Foreman

3 Scope of Works and Outline

This construction method statement is for the construction of all stormwater drainage. This shall include the following construction steps for both precast concrete pipes and precast concrete box culverts and the associated precast concrete headwalls.

- Preliminary Works
- Excavation
- Bedding, Haunch and Placement of Culverts
- Backfill of Culverts
- Control of construction vehicles over installed culverts/pipe

4 Plant and tools

The following plant shall be utilised in the completion of the works

- Excavators (varying sizes 2t to 20t)
- Vacuum Excavation Trucks
- Body Trucks (varying sizes)
- Vibrating Plate Compactor
- Trench Rollers
- Wacker packer
- Water Truck
- Lifting Gear
- Skid Steer Loaders
- Survey Equipment, Inc. pipe laser
- General Hand Tools
- Saw Cutters
- Testing Equipment
- Shoring Boxes and Formwork

5 Permanent Materials

The following permanent materials shall be utilised in the completion of the works:

- Reinforced concrete pipe
- Precast headwalls
- Rubber rings
- Ready-mix concrete
- Bedding/haunch/overlay – 10mm Stone
- Backfill zone to trench - Backfill Material – Class A1/B (insitu material if compliant)
- Surface Tolerant Epoxy (Megapoxy P1 or equivalent)

6 Construction Sequence for Reinforced Concrete Pipes

6.1 Preliminary Works

Prior to the commencement of works, the following preliminary works shall be undertaken:

- Location of existing services in accordance with Permit to Work and Permit to Penetrate procedures.
- Vehicle traffic or pedestrian movements will be rerouted from the work area through the approved TGS
- Hold Point MRTS70 (November 2018) CL 15.1 – Obtain approval of concrete mix design
- Hold Point 1 MRTS03 (July 2021) CL 11.2 – Samples of bandage covers are to be made available for inspection to the Administrator.
- Hold Point 2 MRTS03 (July 2021) CL 11.3.1 – Obtain approval of culvert construction procedure
- Witness Point - Pipes are to be inspected for any defects/ flaws prior to use.

6.2 Excavation

- The culvert alignment will be excavated to the line, length and depth as shown on the drawings and any other applicable site instructions and in accordance with MRTS04 (November 2020) CL 13.3.6.
- Excavations shall be appropriately benched, battered or supported to avoid ground collapse.
- Where excavation is greater than 1500mm deep & benching, battering is not possible or geotechnical assessments deem the ground to be unstable, shoring shall be used to support the excavation. Shoring will be sourced to suit the width and depth of the trench.
- During excavation, excavated material and loads near excavation shall be placed a minimum of 1000mm away from the excavation.
- Excavations and Shoring shall be monitored and inspected daily using the Project Field Inspection – Excavations and Shoring Check list.
- The density of the material in the bottom of the excavation is to comply with MRTS04 (November 2020) CL 15, Table 15.3B = 95% relative compaction. Where the material does not comply, it shall be compacted to a depth of 150mm to meet the 95% relative compaction requirement.
- Excavated material will either be stockpiled onsite to be reincorporated onsite, otherwise materials will be spoiled offsite.

6.3 Bedding, Haunch and Placement of Culverts

- Bedding material in accordance with MRTS04 (November 2020) CL 19.2.6 will be placed at the bottom of the trench and the material shall be compacted until the surface of the material becomes stable under compaction equipment. Bedding will be placed at 100mm thickness for pipes less than 1350mm in diameter
- As per MTRS04 (November 2020) Clause 19.2.7 states that where 10mm or 20mm nominal size aggregate is used a geotextile is required to surround all bedding material.

- Once a storm water trench has been excavated a site inspection is to take place with BMD and Seqwater Inspectors to inspect the trench floor and walls and if deemed suitable onsite no geotextile is to be placed. The trench base will be tested and the nominated 10mm or 20mm drainage aggregate used to bed the pipes to the required thickness and pipes haunched accordingly (approximately half way up the pipe).
- The above process is to be completed for all storm water trenches, in the event that the trench floor fails the required testing parameters or the trench excavation has been excavated through poor or unsuitable ground as deemed by the site inspectors, a geotextile shall be placed and surround all the required bedding material.
- Each reinforced concrete pipe will be lifted into the trench by the excavator or crane with the appropriately rated and tested lifting equipment. The pipe will then be placed into the trench and the drainage crew will place and join subsequent pipes together by installing the rubber ring in accordance with the supplier's installation guidelines. Each pipe will be checked when placed by a pipe laser and target to confirm position and grade of the pipe.
- Each pipe will be placed so that the spigot end of the pipe is directed downstream, with pipes to be laid in an upstream direction. Note that it may not always be possible to lay pipes in an upstream direction due to staging and tie in works to existing structures.
- All joints should be clean and free from foreign matter prior to joining.
- The lifting point and/or location marked "TOP" will be placed at the upper most location and cap installed prior to backfill.
- When pipes are to be cut to length to suit individual drainage lines, the resulting cut should provide a neat end surface and be covered with two coats of surface tolerance epoxy, Megapoxy P1 or listed equivalent.
 - Cutting of pipes will only be undertaken above ground and to be undertaken with personnel standing on firm, level ground in an unrestrictive environment.
 - Personnel to work from the side of the pipe at all times.
 - Pipes larger than 225mm are to be supported by 3 sets x 100mm and 1 set of 75mm timber beams or a pipe cradle if available or during the cutting process.
 - One set of timber beam approx. 300mm from the end of the longest proposed portion of the pipe, with the other two sets of timber beams approx. 150 mm either side of the centre of the proposed cut line.
 - 4th Set of smaller timber 75 x 75 mm is to be utilised 100mm from the far end of the cut section as fall support where the length of the cut off piece allows.
 - Ensure the barrel of the pipe is to sit clear of the ground (approx. 100mm) and be fully supported on the beams ensuring the bell end of collared pipes are also clear if applicable
- If a concrete bandage is required to join new pipes to existing pipes or structures, detailing will be confirmed from Administrator prior to proceeding with work.

- Haunch zone material in accordance with MRTS04 (November 2020) CL 19.2.6 will be placed at a depth as indicated on TMR SD 1359 and the material shall be compacted until the surface of the material becomes stable under compaction equipment.
- After the pipe is completely laid and before covering, the pipe is to be inspected and Hold Point released as per MRTS 04 (November 2020) CL 19.3.3. Note that Side Zone material may be placed prior to release of the Hold Point, however the pipe must still be visible. The Side Zone material ensures that the pipe position is locked into place in the trench.

6.4 Backfill of Culverts

- The backfill to culverts in the overlay zones shall be performed so that there is no movement or damage to the precast units. Backfill shall be undertaken so that there is not more than a 150mm level difference on either side of the culvert.
- For overlay zones, material within 300 mm of the structure, culvert, pipe, etc shall be 10mm stone shall be compacted until the surface of the material becomes stable under compaction equipment. Elsewhere, overlay zone material shall be earth backfill material complying with the requirements of MRTS04 (November 2020) CL19.2.2 and may contain stone size up to 150 mm maximum dimension.
- A 2 tonne trench roller will be used above overlay material (300mm above pipe to 450mm over the pipe) to compact fill material

6.5 Completion of Installation

- All works carried out on site will be documented and recorded by the Stormwater Drainage ITP.
- Conformance and testing certificates for the material quality and conformance testing as required by the specification and ITP will be included in the lot records where applicable. A lot map indicating the area of the individual lot record/ ITP.
- At the completion of the pipe installation, the contractor shall undertake a CCTV defect inspection and report to demonstrate that the completed pipe installation is acceptable to Seqwater and that the pipes are correctly installed and are free of defects as defined in MRTS25 for Steel Reinforced Concrete Pipes and free of cracks and joint damage for Fibre Reinforced Concrete Drainage Pipes. Acceptance of this report by the Administrator shall be a Hold Point.
- This shall be enabled by the introduction of an additional Witness Point to provide notice to the Administrator that the installation is considered ready for CCTV inspection
- Following the CCTV completion the Contractor is to as soon as practicable provide to the Administrator the WNCAN report (HP) and any additional information required to allow the Administrator to release the HP
- Other considerations are:

The complete length of each drainage line needs to be backfilled to be considered ready for CCTV inspection – i.e sandbagged to back-of pit/headwall or otherwise constructed pit

7 Particular Hazards/Risks

8.1 Safety and Health

- Working around plant
- Working near live traffic
- Live services
- Flying debris
- Noise
- Working with hand tools, sharp materials
- Slips, Trips and Falls
- Confined Space Entry

Refer to relevant BMD WMS and subcontractor WMS

8.2 Environmental

- Unknown Aboriginal and European heritage items
- Disturbing native flora and fauna
- Petrol, oils, dirty water etc. entering waterways and existing farm dams
- Mud tracking onto public access roads
- Introduction of weeds from off the site
- Spread of weeds across the site
- Damage to vegetation, flora and fauna
- Introduction or spread of Fire Ants

8.3 Community

- Noise from plant and equipment
- Vibration from plant and equipment

8.4 Public Protection

- Prevent flying debris and materials damaging cars, wind screens, pedestrians and cyclists
- Prevent unauthorised pedestrian access onto site

We, the undersigned, confirm that this CMS has been explained, its contents are clearly understood, and that we have been given the opportunity to make comments. We also confirm that our required qualifications to undertake this activity are current. We also clearly understand that the controls in this CMS must be applied as documented, otherwise work is to cease immediately.

Date	Name	Employer	Signature

Comments:

