



8108 Subsoil Drains, Road Crossings

REVISION 10/01/2024

8108.1 Introduction

This supplementary specification refers to the supply and installation of Type C subsoil drains, within uPVC envelopers at road crossings, and the connection of these crossings into stormwater drainage components.

8108.2 Referenced Documents

This supplementary specification shall be read in conjunction with the following:

- MRS01 *“Introduction to Specifications”*.
- MRTS01 *“Introduction to Technical Specifications”*.
- MRS03 and MRTS03 *“Drainage, Retaining Structures and Embankment Slope Protections”*.
- MRS04 and MRTS04 *“Earthworks General”*
- AS/NZS 1254. *“PVC-U pipes and fittings for stormwater and surface water applications”*
- AS 2439.1 *“Perforated plastics drainage and effluent pipe and fittings Part 1: Perforated drainage pipe and associated fittings”*.
- Supplementary Specification No. 8107 “Subsoil drains, Type C”; and
- the project Drawings

8108.3 Description of Work Items

Work items incorporated by this supplementary specification are identified in Section 8108.6 and 8108.7 with individual activities/tasks for measurement and payment sourced from the Bill of Quantities and listed in MRC Supplementary Specification Annexure 8108_1 Subsoil Drains, Road Crossings Section 1

8108.4 Quality Systems Requirements

8108.4.1 Standard Test Methods (Testing Regime)

The following minimum testing regime applies to this specification:

Unless otherwise stated the manufacturer certification of the subsoil drain and components shall form the basis of the requirements.

Civil works activities associated with the subsoil drains shall be tested as per the relevant MRTS specification MRTS03, & MRTS04, unless otherwise approved by the Superintendent.

8108.4.2 Hold Points, Witness Points and Milestones

The following table represents the minimum inspection requirements for this specification;

Activity	Inspection Type	When
Construction Procedure and other submissions as required by Clause 8108.5	Milestone	4 Weeks prior to works commencing
Inspection of delivered items	Hold Point	At delivery time for each item.
Final location of subsoil drain	Witness Point	During site survey layout.



and enveloping pipe works extents		
Excavation of material	Witness Point	During excavation
Base excavation floor	Hold Point	At completion of excavation and compacting
Geofabric installation (as required outside of the extremities of the enveloping pipe)	Witness Point	After base floor inspection approval to proceed
Bedding for enveloping pipe	Witness Point	After base floor has been inspected and approval to proceed has been granted
Enveloping pipe laid	Witness Point	After bedding laid and compacted
Subsoil drains inserted and laid	Hold Point	Prior to commencing backfilling operations
Ends of enveloping pipe sealed	Witness Point	Prior to backfilling commencing
Connection to existing subsoil or drainage lines/pits	Witness Point	Prior to backfilling commencing
Backfilling of enveloping pipes	Hold Point	After subsoil drain inserted and ends of enveloping pipe sealed
Outlets (as required)	Witness Point	After stormwater pits or swales have been completed
Flushing sub soil drains	Witness Point	After completion of backfilling
Works as Executed documentation	Hold Point	4 weeks prior to practical completion being requested.

8108.4.3 Construction Tolerances

Unless otherwise approved by the Superintendent the following construction tolerances shall apply as to this Specification;

The construction activity outcome shall not depart from the widths, lengths, heights, and shapes specified by the relevant specifications as applies to this specification;

- Concrete tolerances in accordance with MRTS70 Concrete.
- Earthworks tolerances in accordance with MRTS04 General Earthworks.
- Bedding, laying, and backfill to culvert tolerances in accordance with MRTS03
- Pavement tolerances in accordance with MRTS05 Unbound Pavement

Tolerances specific to the project are detailed on the design drawings and are included in Clause 2 of MRC Supplementary Specification Annexure 8108_1 Subsoil Drains, Road Crossings

8108.5 Preliminary

The Contractor is to submit the following documentation 4 weeks prior to commencing work or a prestart is conducted. (MILESTONE):

- Works procedure
- Erosion and Sediment Plan (as required for site/s)
- Traffic Management Plan and TGS's



Other preliminary requirements unique to the project will be listed in the MRC Supplementary Specification Annexure 8108_1 Subsoil Drains, Road Crossings (MILESTONE)

8108.5.1 Materials

Supply of materials to site is the responsibility of the Contractor at their cost, where items are Principal supplied the nominated storage site shall be obtained from MRC Supplementary Specification Annexure 8108_1 Subsoil Drains, Road Crossings Section 3 and shall be the point of supply.

Unless instructed otherwise by the Superintendent existing subsoil drains and fittings are to be salvaged, MRC Supplementary Specification Annexure 8107.1 Section 4 will detail the items to be salvaged and the nominated storage site. This will also include any reuse of existing items.

The filter/backfill material to the enveloping pipe and trench shall be supplied in accordance with Specifications MRTS03 and MRTS04.

Filter/backfill material outside of the extremities of the enveloping pipe shall consist of course sand complying with the grading requirements outlined on Mackay Regional Council's Standard Drawing A3-00867.

All subsoil drainage items and materials shall be supplied in accordance with Specifications MRTS03 and MRTS27.

Unperforated pipes and associated fittings and jointing procedures shall comply with AS/NZS 1254. "*PVC-U pipes and fittings for stormwater and surface water applications*" and shall be of the same type and class as noted in the design drawings.

Perforated drainage pipes used in Type C subsoil drains and associated fittings and jointing procedures shall comply with AS 2439.1 "*Perforated plastics drainage and effluent pipe and fittings Part 1: Perforated drainage pipe and associated fittings*".

Sealing agent/s (foam as an example) for the ends of the enveloping pipe shall be as shown on the design drawings or approved by the Superintendent.

8108.6 Construction

This section lays out the works operations with more detail based on specific requirements of this supplementary specification. Some activities may appear to include items which are stated within other specifications, the purpose is to reinforce that requirement specific to this supplementary specification.

MRC Std Drawing A3-00867 is the reference drawing for the installation of the sub soil drainage, filter/backfill material, and grade, other details including use of geofabric surround of backfill is to be carried out as required by MRTS03.

No construction equipment or vehicles shall stand or travel directly along or over the completed subsoil drain trench until all backfilling has been completed.

8108.6.1 Work Operations

Work operations incorporated in this item will include:

- a) **Work operations included in Clause 2.2.5 of MRS01 "Introduction to Standard Specifications";**
- b) **Supplying all materials inclusive of pipes and fittings;**



All materials, plant, and labour required to carry out the works under this Specification is to be supplied by the Contractor, where the enveloping pipe, subsoil drainage pipe and fittings are Principal supplied the designated storage site will be the point of supply for the purposes of this Specification.

All items shall be inspected at delivery to site prior to use. Any items which are damaged are not to be used and are to be returned to the supplier. (HOLD POINT)

c) Carrying out excavations;

Prior to excavation commencing the location of the enveloping pipe and subsoil drainage, connections, and outlets are to be marked out on site. (WITNESS POINT)

Excavations for subsoil drainage are to be carried out in accordance with design drawings, where no details are provided refer to MRC Std Drawing A3-00867. (WITNESS POINT)

If during excavation the walls of the trench are not perpendicular or width stated the trench is to be refilled, compacted, and re-excavated to the right dimensions.

All loose material is to be removed from the bottom of the excavation, the floor of the excavation is to be prepared and presented for inspection for the Superintendent (HOLD POINT)

d) Compliance of trench inclusive of testing;

If over excavation occurs the trench is to be filled back to design level, trimmed, and compacted and tested prior to proceeding with inspection of the floor by the Superintendent.

Unless the above applies or otherwise specified in MRC Supplementary Specification Annexure 8108_1 Subsoil Drains, Road Crossings testing of the floor is not required.

e) Utilising or disposing of excavated material;

Excess excavated materials shall be disposed of by the contractor or utilised as per Superintendents instructions. Material stockpiled shall ensure that all Environmental ESC measures are in place and maintained.

f) Installation of uPVC stormwater pipe at road crossings;

The extents of the enveloping pipe shall be as noted on the design drawings, in the absence of detail the Superintendent shall direct the contractor on the extents taking into account kerbing, alignment of subsoil drainage and/or stormwater drainage, connector fitting types, and outlet requirements.

The size of the enveloping pipe shall be as per the design drawings and be 1.5 times greater in diameter than the subsoil drainage pipe. The cover over the enveloping pipe shall be no less than the diameter of the enveloping pipe.

The enveloping pipe shall be laid on a compacted bedding layer fully supported and on a constant grade in a straight line along the centre of the trench as required by the design drawings, in the absence of detail the thickness of the bedding layer shall comply with MRTS03 and MRTS04. any variation will require taking up and relaying. (WITNESS POINT)

All joints of the enveloping pipe shall be sealed with a PVC Solvent cement where pipe sizes do not accommodate rubber ring jointing. The design drawings shall show the pipe type and sealing method.

Once the sub soil drain has been inserted and connected at each end the enveloping pipe shall be sealed for a minimum 1 metre with a "foam fill" as per the design drawings or as approved by the Superintendent. (WITNESS POINT)



g) Installing drainage pipes;

The subsoil drainage pipe shall be inserted into the enveloping pipe.

Connections and outlets are to be installed as per the design drawings with the correct fittings and fabric wrapping as required to ensure no penetration of backfill material into the subsoil pipe. Where design drawings do not show detail installation shall be carried out as per MRC Std Drawing A3-00867. (HOLD POINT)

h) Placing, jointing, and fixing textile sleeves;

Geofabric jointing, overlapping, and fixing shall be carried out as manufacturers recommendation and as required by MRTS27 Section 9 and be written into the contractors Work Procedure. (WITNESS POINT)

i) Installation of connectors from the subsoil drain to the stormwater pipe at either end of the crossing.

Connections of subsoil drains shall be carried out in accordance with design drawings with uPVC materials and connectors. This should form part of the submitted works procedure for the Superintendents approval.

j) Placing and compacting backfilling material.

Backfill layers are to be maximum 150mm compacted, each layer is to be compacted in accordance with MRTS04. (WITNESS POINT)

Filter/backfill material outside of the extremities of the enveloping pipe shall consist of course sand complying with the grading requirements outlined on Mackay Regional Council's Standard Drawing A3-00867.

k) Finishing outlets (as required)

Outlets are to be installed as required by the design drawings, in the absence of detail MRTS Std Drawing SD-1116. (WITNESS PONT)

Where kerbing does not exist marker posts are to be installed at the clean out and also the outlet.

l) Flushing of Pipes

After the drains are completed all installed subsoil drains shall be flushed with the flushing continued until the outlet water is clean and flows consistently. (WITNESS POINT).

8108.7 Post construction

a) Collection and submission of all As Constructed data including QA data requirements.

Contractor is to supply and submit Works as Executed documentation as required by *MRC D20 - Drawings and Documentation* for approval by the Superintendent 4 weeks prior to requesting a practical completion inspection. (HOLD POINT)

Format of submitted "As Constructed" documentation shall be compliant with MRC Supplementary Specification 8919.

8108.8 Measurement and Payment

The length of subsoil drain road crossing, under this item, shall be measured as the distance along the centreline of the enveloping pipe where it is being installed.



Provision for these works shall be included in the scheduled unit rate for the items show in Clause 8108.3 of this Supplementary Specification and Annexure. No separate payment will be made for the works specified within this Supplementary specification or it's annexure.

Version Control:

Version	Description	Reviewed / Endorsed	Date
1.0	Original issue		09.02.2022
2.0	Review of specification	C. Sultana	10.01.2024