



8207 Dissipater Structures

REVISION 25/08/2025

8207.1 Introduction

This supplementary specification refers to the construction of dissipater structures to stormwater drainage culvert components.

8207.1.1 Definition of Terms

This section describes any term which are specific to this specification or requires clarification due to an ambiguous understanding.

Term	Definition
Dissipater	Structure designed to dissipate energy of stormwater outlet flows and control scouring of downstream bank erosion of the drainage structure by retarding and spreading concentrated outlet flow.
Bed Friction Outlet Dissipaters	These types of dissipaters use coarse rock creating a rough bed which retards the outlet flows reducing the potential for downstream scouring.
Hydraulic Jump Dissipaters	These types of dissipaters operate by creating a hydraulic jump in the flow level of the stormwater by effectively reducing the velocity of the flow.
Plunge Pool Dissipaters	Operate by allowing stormwater flows to free fall into a pool effectively dissipating the energy and controlling downstream bed scour
Stepped Spillway Dissipaters	Dissipate energy by controlling the flow down a face of a spillway, generally by creating the formation of a hydraulic jump at the base of the structure
Impact Dissipater	Structures which break up jet flows and create turbulent flows, they can be walls, blocks (precast or insitu poured).

8207.2 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 *“General earthworks”*;
- MRS70 and MRTS70 *“Concrete”*;
- MRC Supplementary Specification 8300 *“Soft Landscape and Horticultural Treatment”*;
- MRC Standard Drawing A3-6757 & A3-6758 *“Outlet Structures”*;



- IECA Australasia Best Practice Erosion and Sediment Control document “Book 4 – Design Fact Sheets”;
- IECA Australasia Best Practice Erosion and Sediment Control document “Book 5 – Field Guides”;
- Queensland Urban drainage manual (QUDM);
- The project Drawings; and
- Manufacturer’s Specifications, as applicable.

8207.3 Description of Work Items

Work items incorporated by this supplementary specification are identified in Section 8207.6 and 8207.7 with individual activities/tasks for measurement and payment sourced from the Bill of Quantities and listed in MRC Supplementary Specification Annexure 8207_1 Dissipater Structures Section 1

8207.4 Quality System Requirements

8207.4.1 Std test Methods (Testing Regime)

The following minimum testing regime applies to this specification:

Civil works activities associated with excavation shall be tested as per MRTS04 – General Earthworks unless otherwise approved by the Superintendent.

Concrete works shall be tested as required by MRTS70 - Concrete unless otherwise approved by the Superintendent.

Where rock is used the type and size of the rock for each component of outlet protection shall comply with the design drawings and documents, all rock shall be measured unless otherwise approved by the Superintendent.

8207.4.2 Hold Points, Witness Points, and Milestones

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

Activity	Inspection Type	When	Reference
Construction Procedure and other preliminary documentation as required by Clause 8170.5	Milestone	4 weeks prior to works commencing	8205.5
Inspection of delivered items	Hold Point	At delivery time for each item.	8207.6.2
Final location and alignment of dissipater structure	Hold Point	Prior to excavation commencing	8207.6.3
Bottom of excavation inspected for unsuitable material	Hold Point	At the completion of excavation and compacting of the excavated floor	8207.6.4
Inspection of excavated floor prior to installing dissipater structure	Hold Point	After compacted, trimming, and testing of excavated floor	8207.6.6
Submission of procedure where groundwater or unsuitable material has been encountered (as required)	Hold Point	Prior to excavated floor stability works	8207.6.6



Excavated floor compliant, all test results submitted and compliant, alternative floor and bedding installed and approved by RPEQ Consultant	Hold Point	Prior to installing approval to proceed with installation of GPT	8207.6.6
Supply and installation of geotextile to base of structure	Witness Point	During and at completion of laying geotextile	8207.6.7
Concrete prepour inspection (as applicable)	Hold Point	Prior to pouring concrete	8207.6.8
Concrete curing process (as applicable)	Witness Point	Immediately after concrete pour initial set	8207.6.8
Approval to strip formwork (as applicable)	Hold Point	72 hours after pouring	8207.6.8
Joint sealing in concrete	Witness Point	Following stripping of formwork	8207.6.8
Rip Rap installation (as applicable)	Hold Point	After laying and installing approved rock	8207.6.9
Installation of impact structures (blocks)	Witness Point	During concrete works and/or prepour inspections	8207.6.10.1
Rock dissipater installation as per design drawings and documentation	Witness Point	During rock structure installation	8207.6.10.2
Gabions location and filling as per the design drawings and documentation	Witness Point	During gabion installation	8207.6.10.2
Geotextile laid under rock treatment including gabions	Witness Point	Prior to and during rock installation	8207.6.10.2
Inspection, testing, and tolerance compliance rock structures	Hold Point	Prior to and during rock structure installation	8207.6.10.2
Inspection, testing, and tolerance compliance drop structures	Hold Point	Prior to and during drop structure installation	8207.6.10.3
Backfilling process	Witness Point	During backfilling process	8207.6.11
Make safe and reinstatement of disturbed areas as per plans (as required)	Hold Point	After backfilling has been completed	8207.6.12
Compliance of dissipater structure to design drawings and documentation	Hold Point	At completion of works	8207.7.1
“As Constructed” documentation	Hold Point	4 weeks prior to practical completion being requested.	8207.7.2

8207.4.3 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.
- Protection device/s tolerances in accordance with MRTS03 Drainage, Retaining Structures and Embankment Slope Protections

Tolerances specific to the project are detailed on the design drawings and documents, and are included in Clause 2 of MRC Supplementary Specification Annexure 8207_1 Dissipater Structures

8207.5 Preliminary

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

- Works procedure – all activities and order of construction
- Environmental Management Plan
- Erosion and Sediment Control Plan (as required for site/s)
- Traffic Management Plan and TGS's (as required)
- All backfill, embankment fill compliance tests
- Statement of material procurement and compliance to design drawings and documents (geofabric, rock and/or precast elements)

Other requirements unique to the project will be listed in the MRC Supplementary Specification Annexure 8207_1 Dissipater Structures

MILESTONE

8207.5.1 Materials

Supply of all 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 8207_1 Dissipater Structures Section 3 and shall be the point of supply.

8207.5.1.1 Geotextile Material

All geotextile materials shall comply with MRTS27 and be specifically designed for the site specific use and dissipater application, it shall be heavy duty, needle punched, non-woven filter cloth.

8207.5.1.2 Rock Fill Material

All rock must be hard, angular, durable, weather resistant, and evenly graded with 50% by weight larger than specified nominal rock size and sufficient small rock to fill voids between the larger rock. The diameter of the largest rock size should be no larger than 1.5 times the nominal rock size. Specific gravity to be at least 2.5.

Sedimentary rocks, as well as laminated, fractured, and porous rocks shall not be used.

Other requirements or variation to the above are listed within Section 5 of Annexure 8207_1 Dissipater Structures.

8201.5.2 Construction Process

Council requires the submission of the contractor's construction process and procedures a minimum 4 weeks prior to works commencing or prestart being conducted, including proposed testing and inspection regimes.

As a minimum the construction process will include but not be limited to the following identified work operations and cover the installation activity of preparation, excavation, supply and placement of dissipater structures as detailed on the design drawings and documentation.

MILESTONE



8207.6 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.

Specific construction requirements associated with these works is detailed in MRC Supplementary Specification Annexure 8207_1 Dissipater Structures Section 5.

Where site works (including constructability) are in conflict with the design drawings and/or project documentation the Contractor is to immediately raise this conflict with the RPEQ Engineering Consultant and the Superintendent. Depending on the nature of the conflict the RPEQ Engineering Consultant shall submit an endorsed resolution for the conflict to the Superintendent for approval. This includes foreseen conflicts being reported during the works planning by the Contractor prior to commencing works.

8207.6.1 Work Operations

Work operations incorporated in this item are those included in Clause 2.1.5 of MRS01 ‘Introduction to Standard Specifications’ and the following work scope activities and associated sub activities.

8207.6.1.1 Work Scope

The scope of works (including all associated sub activities) covered under this specification shall include but not limited to the following:

- Demolition of existing components or structure/s where rectification works are carried out,
- Storage of identified materials for reuse, as identified,
- Supply and installation of temporary fencing and permanent safety measures to dissipater structure/s as approved.
- Earthworks required to form the dissipater structure/s shape and formation,
- Rock and gabion work, (as required),
- Concrete works as required (as required),
- Install hydraulic structures including scour protection,
- Supply and installation of liner including joining of edges as required by the manufacturer,
- Install dissipater structures and flow distribution structures (as required),
- Carry out reinstatement site works to the disturbed areas to pre-construction condition,
- Compliance requirements, Survey and Testing of media/material layers preconstruction and insitu during and after construction
- Preparation and submission of QA documentation.

8207.6.2 Supply of all materials;

All materials, plant, and labour required to carry out the works under this Specification is to be supplied by the Contractor, where materials 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 or are not compliant with size and type as specified are not to be used and are to be returned to the supplier.

HOLD POINT



8207.6.3 Site layout with Superintendent

The final location and extremities of the dissipater is to be marked out on site and shall be inspected and approved by the Superintendent prior to excavation commencing.

HOLD POINT

8207.6.4 Excavation, as required

Excavation of material to level and grade as per design drawings, dimensional tolerances to be compliant with the design drawings and documentation requirements.

Bed/Subgrade is to be inspected for areas of unsuitable material and possible groundwater.

If unsuitable material is identified this is to be removed and replaced with approved material as per the instructions of the Superintendent.

HOLD POINT

8207.6.5 Utilising or disposing of surplus 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. If disposal offsite is to occur and dependent on volumes materials are to be disposed at regulated waste facilities or at site with current Bulk Earthworks approvals in place. Spoil disposal criteria and methodology as per MRTS 51 and EP175 are to be followed.

8207.6.6 Compacting material at bottom of excavations

Excavated floor preparation including compaction shall be carried out as per MRTS03 and MRTS04 and is to be presented for inspection by the Superintendent with inspections, geotechnical testing and geometric requirements applying unless stated otherwise in MRC Supplementary Specification Annexure 8207_1 Dissipater Structures.

HOLD POINT

If groundwater or unsuitable material is present the Contractor shall submit a modified installation procedure endorsed by the Contractors RPEQ Engineering Consultant. The contractor is responsible for the dewatering of the site at no cost to the Principal.

HOLD POINT

Approval to proceed with installation shall be granted by the Superintendent upon the receipt of compliant test results and/or alternative floor and bedding installation has occurred and approved by the Contractors RPEQ Engineering Consultant.

HOLD POINT

8207.6.7 Supply and Installation of Geotextile to Base of Dissipater Structure

The geotextile required shall be as required by the design drawings and fit for purpose to the dissipater structure designed and comply with MRTS 27 Geotextiles Separation and Filtration, including construction requirements. The following specific requirements shall apply to this specification;

- The alignment of the long side of the geotextile shall align with the direction of the water flows,
- All joints shall be overlapped and sewn together in accordance with Clause 9.3 MRTS 27,
- The geotextile shall be pinned down prior to being overlaid with approved materials,
- Rock armour shall be placed on the geotextile from <300mm height, with no construction equipment travelling on the laid geotextile,
- Upgrade edges shall be buried into the ground to prevent undermining of dissipater structure.

**WITNESS POINT****8207.6.8 Concrete Pours (as applicable to the structure type)**

All concrete works (including formwork and reinforcing) associated with the dissipater structure shall comply with the design drawings and be carried out in accordance with MRTS70, MRTS71, and the design drawings with inspections, geotechnical testing and geometric requirements applying unless otherwise specified in MRC Supplementary Specification Annexure 8207_1 Dissipater Structures.

Prior to carrying out concrete works a prepour inspection of formwork and reinforcing is to be carried out. In conjunction with the reinforcing all joints and dowels linking to adjacent section pours, and geofabric and weep holes are to be installed as per the design drawings prior to the respective pours taking place. The Superintendent shall give approval to proceed with the pour.

HOLD POINT

Immediately after the initial set of the concrete, curing shall commence and continue for a minimum of seven days. Plastic sheeting shall not be used as part of the curing process.

WITNESS POINT

Formwork is not to be stripped for 72 hours and loading not to occur for 7 days or as per project plans as approved by the Superintendent.

HOLD POINT

All joints are to be installed and sealed as per the design drawings.

WITNESS POINT**8207.6.9 Riprap Protection (as applicable)**

Supply of rock materials and its source shall be approved by the Superintendent prior to use, where possible, existing materials shall be utilised as riprap. Riprap works shall comply with the design drawings and to be carried out in accordance with MRTS03 Clause 35. Where riprap is concrete grouted this shall be carried out in accordance with MRTS03 Clause 34.

HOLD POINT**8207.6.10 Carrying out all works to allow the installation of the dissipater structure and materials as specified on project Drawings, to the manufacturer's requirements, as applicable.**

The type of dissipater infrastructure and its function will vary based on site conditions and inlet or outlet flow conditions, this includes material type, geometrics for size, levels, and grades of structure/s. The Contractor shall carry out installation of the dissipater structure, inclusive of all associated activities, as detailed in the design drawings and documentation.

8207.6.10.1 Install Impact Structures (precast or insitu poured)

During concrete pour operations the impact blocks are to be installed either as precast blocks placed into the insitu poured concrete base or formed and insitu poured as part of the whole structure. All blocks shall be tied to the main concrete structure as shown in the design drawings.

WITNESS POINT**8207.6.10.2 Install Rock Structures (as inlet or outlet protection)**

Rock dissipaters shall be installed with the rock size, location, extent (width and length) of the structure, and depth of rock as required by the design drawings and documentation.

WITNESS POINT



Where gabions are specified, they shall be sized and placed as per the design drawings and documentation and where there are multiple and stepped tied together with the other baskets. Rock fill for the gabions shall be as specified in the design drawings and documents.

WITNESSPOINT

Geotextile of the specified type shall be laid on the prepared floor prior to the rock installation or gabion installation and overlapped and sewn together as per MRTS03.

WITNESS POINT

All testing, inspections, and tolerances shall be compliant with the type of dissipater structure and activity quality requirement, i.e. concrete pours – MRTS70.

HOLD POINT

8207.6.10.3 Install Dissipater Drop Structure/s

These structures and ancillary structures/material requirements shall be set up and installed to line, level, and size as required by the design drawings, they can take the form of plunge pools, stilling basins, hydraulic jump structures, or stepped spillways as examples. All testing, inspections, and tolerances shall be compliant with the type of dissipater structure and activity quality requirement, i.e. concrete pours – MRTS70.

HOLD POINT

8207.6.11 Backfill and compaction

Backfill materials and the backfilling process shall be carried out in accordance with MRTS04. Layers are to be laid and compacted in 150mm maximum compacted layers. Testing of the backfill shall be carried out as required by MRTS04. The backfill shall be completed to the finished surface levels or any adjacent concrete or landscaped area as required by the design drawings and documents.

WITNESS POINT

8207.6.12 Make safe and reinstating disturbed surfaces, where applicable.

Prior to the “On maintenance” inspection the Contractor shall;

- Remove any temporary barriers/fencing and ensure that non-climbable fencing and/or perimeter planting to control public access is installed as required by the design drawings, fencing shall be compliant with QUDM s12.4 Safety fencing.
- All disturbed surfaces shall be reinstated with topsoil and turf where required by the design drawings and documents, all waste materials and excess soil disposed of as approved by the Contractors Environmental Plan or as directed by the Superintendent.
- Where the design drawings indicate landscape plantings are required this shall be carried out in accordance with MRC Supplementary Specification 8300.

HOLD POINT

8207.7 Post Construction

8207.7.1 Compliance of dissipater structure

At the completion of all works the Contractor is to present the completed dissipater structure for inspection by the Superintendent to verify compliance to the design drawings and documents.

HOLD POINT



8207.7.2 Collection and submission of all As Constructed data including QA data requirements.

The Contractor is responsible for the collection and submission of As-Constructed documentation as required by *MRC D20 - Drawings and Documentation* for approval by the Superintendent 4 weeks prior to requesting a “on maintenance” inspection.

The format of submitted “As Constructed” documentation shall be compliant with MRC Supplementary Specification 8919.

HOLD POINT

8207.8 Measurement and Payment

Provision for these works shall be included in the scheduled unit rate for the items show in Clause 8207.3 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	Review	MRC	07.12.2021
2.0	Review	C. Sultana	25.08.2025