



8208 Causeways & Floodways

REVISION 07/02/2024

8208.1 Introduction

This supplementary specification refers to the construction of concrete causeways and floodways.

8208.1.1 Definition of Terms

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

Term	Definition
Floodway	A roadway across a shallow depression or watercourse subject to flooding, specifically designed to overtop and constructed to resist the damaging effects of overtopping.
Causeway	A roadway across a watercourse or across tidal water, specifically designed to resist submergence through the installation of Culverts to drain the perennial or frequent flows through under the Floodway Structure

8208.2 Referenced Documents

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

- MRS01 *“Introduction to Specifications”*;
- MRTS01 *“Introduction to Technical Specifications”*
- MRS50 and MRTS50 *“Specific Quality System requirements”*
- MRS03 and MRTS03 *“Drainage, Retaining Structures and Embankment Slope Protections”*;
- MRS04 and MRTS04 *“General Earthworks”*
- MRS05 and MRTS05 *“Unbound pavements”*
- MRS27 and MRTS27 *“Geotextiles (Separation and Filtration)”*
- MRS70 and MRTS70 *“Concrete”*
- MRS71 and MRTS71 *“Reinforcing Steel”*
- DTMR Std Drawings SD1250, SD1260, SD1270, SD1271, and SD1359
- MRC D20 *“Drawings and Documentation”*; and
- the project Drawings

8208.3 Description of Work Items

Work items incorporated by this supplementary specification are identified in Section 8208.6 and 8208.7 with individual activities/tasks for measurement and payment sourced from the Bill of Quantities and listed in MRC Supplementary Specification Annexure 8208_1 Causeways & Floodways Section 1



8208.4 Quality Systems Requirements

8208.4.1 Std Test Methods (Testing Regime)

Unless otherwise approved by the Superintendent the following minimum testing regime applies to this specification:

The minimum test frequencies and minimum numbers of tests shall be as follows:

- Concrete shall be tested in accordance with MRTS70 Concrete.
- Earthworks shall be tested in accordance with MRTS04 General Earthworks.
- Bedding and backfill to culverts if required shall be tested in accordance with MRTS03 and MRTS04
- Pavement shall be tested in accordance with MRTS05 Unbound Pavement

Where there are additional testing requirements these are included in Clause 2 of MRC Supplementary Specification Annexure 8208_1 Causeways

8208.4.2 Hold Points, Witness Points and Milestones

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

Activity	Inspection Type	When
Permits for water way barrier from SARA	Hold Point	Prior to works tender documents being issued
Construction Procedure and other required documents as per 8208.5	Milestone	4 Weeks prior to works commencing
Seal Design	Milestone	14 days prior to request for pavement proof roll
Inspection of delivered items	Hold Point	At delivery time for each item.
Final location of causeway works extents including any side track	Hold Point	During site survey layout.
Construct temporary diversion of watercourse to maintain water flows and fish passage as required by approved permit/s	Hold Point	Prior to excavation of existing causeway structure.
Redirection of watercourse through permanent culverts if required and clean up temporary diversion	Hold Point	When works allow for redirecting through permanent drainage structure
Construction of side track and take up at completion of works	Witness Point	Prior to road being closed and at completion of works.



Installation of temporary road furniture and line marking	Witness Point	Prior to sidetrack being opened.
Unsuitable material at excavated floor	Hold Point	Prior to trimming for subgrade approval
Subgrade proof roll and approval	Hold Point	After submission and acceptance of QA test results and survey results.
Select Fill proof roll and approval	Hold Point	After submission and acceptance of QA test results and survey results.
Bed/base for Culverts if required	Hold Point	Prior to approval to proceed with blinding layer
Blinding layer pouring if required	Hold Point	After approval to proceed with pour
Approval to proceed with slab for culverts if required	Hold Point	No earlier than 7 days after pouring of blinding layer
Prepour Inspection of formwork and reinforcing for culvert slab if required	Hold Point	Prior to concrete pour approval to proceed
Finish of concrete slab for culverts if required	Witness Point	Prior to concrete hardening
Curing of concrete slab to occur immediately after pouring	Witness Point	Immediately after pouring for 7 days
Stripping of formwork approval	Hold Point	No earlier than 72 hours after concrete pour finish, approval by Superintendent
Installation of culverts if required	Hold Point	No earlier than 7 days after concrete pour finish and after submission and acceptance of compliant QA survey results submitted.
Backfilling of culverts if required	Witness Point	After approval to proceed granted by Superintendent
Bed/subgrade under causeway slab approval	Hold Point	After proof roll and submission and acceptance of QA test results and survey results. Approval to proceed with causeway concrete slab set up
Prepour Inspection of formwork and reinforcing for culvert slab	Hold Point	Prior to concrete pour approval to proceed



Finish of concrete slab for causeway	Witness Point	Prior to concrete hardening
Curing of concrete slab to occur immediately after pouring	Witness Point	Immediately after pouring for 7 days
Stripping of formwork approval	Hold Point	No earlier than 72 hours after concrete pour finish, approval by Superintendent
Joints installed as per design drawings and sealed	Witness Point	After formwork is removed
Bed/subgrade under aprons, nib walls, headwalls, batter protection	Hold Point	After proof roll and submission and acceptance of QA test results and survey results. Approval to proceed with causeway concrete slab set up
Prepour Inspection of formwork and reinforcing for aprons, nib walls, headwalls, batter protection	Hold Point	Prior to concrete pour approval to proceed
Finish of concrete slab for aprons, nib walls, headwalls, batter protection	Witness Point	Prior to concrete hardening
Curing of concrete to occur immediately after pouring	Witness Point	Immediately after pouring for 7 days
Stripping of formwork approval	Hold Point	No earlier than 72 hours after concrete pour finish, approval by Superintendent
Joints installed as per design drawings and sealed	Witness Point	After formwork is removed
Riprap installation	Hold Point	At completion of installation of riprap.
Subgrade proof roll approaches	Hold Point	After submission and acceptance of QA test results and survey results.
Pavement proof roll – all layers	Hold Point	After submission and acceptance of QA test results and survey results for each layer.
Pavement inspection prior to sealing works	Hold Point	24 hours prior to seal works taking place
Installation of road furniture and line marking	Hold Point	Prior to road being reopened and side track being taken up



All disturbed areas cleaned, tidied, and returned to its natural state	Hold Point	At completion of works prior to Works as execute inspection.
As Constructed documentation submitted and accepted	Hold Point	4 weeks prior to Works as Executed inspection request
Erosion and sediment control measures in place	Hold Point	At completion at Works as Executed Inspection

8208.4.3 Construction Geometric requirements and Tolerances

Unless otherwise approved by the Superintendent the following construction geometric requirements and tolerances shall apply to this Supplementary 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 if required in accordance with MRTS03
- Pavement tolerances in accordance with MRTS05 Unbound Pavement

Geometric requirements and tolerances specific to the project are detailed on the design drawings and are included in Clause 2 of MRC Supplementary Specification Annexure 8208_1 Causeways

8208.5 Preliminary

The project design manager shall ensure that the required State government permits have been obtained and are current prior to the issuing of tender documents.

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

- 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
- Quality Plan detailing requirements of MRTS50 and MRS50.
- All backfill, embankment fill, unbound pavement, and rip rap material compliance tests
- Seal Design (14 days prior to pavement proof roll request)

Other preliminary requirements unique to the project will be listed in the MRC Supplementary Specification Annexure 8208_1 Causeways (MILESTONE)

The contractor is to ensure their construction activities are based on the design drawing requirements. Alternate construction materials and procedures are not acceptable unless site conditions dictate and at the Superintendents approval.

8208.5.1 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 8208_1 Causeways Section 3 and shall be the point of supply.



Reinforced Concrete Box Culverts (RCBC) are the specific culvert type for use as relates to this specification. Reinforced Concrete Pipe Culverts (RCPC) are to only be installed if detailed on the design drawings for use.

Unless otherwise instructed by the Superintendent existing drainage culverts and end wall structures are to be demolished and disposed of, where items are to be salvaged or reused MRC Supplementary Specification Annexure 8208_1 Causeways Section 4 will detail this requirement.

All items and materials shall be supplied in accordance with Specifications MRTS03, MRTS04, MRTS05, MRTS70, MRTS71 and MRTS27.

8208.6 Construction

Carrying out all works associated with the construction and installation of the causeway and approaches with materials as specified on project drawings.

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.

8208.6.1 Work Operations

Work operations incorporated in this item will include:

a) Work operations included in Clause 2.1.5 of MRS01 “Introduction to Standard Specifications”

b) 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 are not to be used and are to be returned to the supplier. (HOLD POINT)

c) Site layout with Superintendent

The final location of the causeway (including temporary creek diversion and side track location, as required) is to be marked out on site and shall be inspected and approved by an MRC representative prior to excavation commencing. (HOLD POINT)

d) Carry out all works to maintain creek flows and fish passage (If required)

As required by the design drawings and approved permit/s install temporary drainage culvert/s and works required to divert the flows of the watercourse through this temporary culvert. (HOLD POINT)

As site works enable carry out works to divert the water course through the permanent culvert and take up the temporary culvert and return the area to its natural state prior to works commencing. (HOLD POINT)

e) Install, maintain, and take up side track (If required)

Construct a side track as specified within the design drawings and as determined on site by the Superintendent. After installation the maintenance of the side track is the responsibility of the contractor at their cost, this includes traffic management. At completion of works take up side



track and return area to natural state that existed prior to works commencing. Side track 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. (WITNESS POINT)

If no side track is detailed on the design drawings the contractor shall incorporate traffic management into their works procedure at their cost.

Remove existing road furniture, posts and footings, and pavement markings, and dispose of by the contractor as detailed in the design drawings unless otherwise instructed by the Superintendent.

Installation of temporary road furniture and line marking as required to carry out works under this specification as set out in the Contractors approved Traffic Management Plan as stages of construction dictate. (WITNESS POINT)

f) Excavate existing infrastructure and disposal of

All works required to excavate, demolish, take up the existing causeway structure/s and be disposed of by the contractor as detailed in the design drawings unless otherwise instructed by the Superintendent.

g) Earthworks to formation

Carry out earthworks as required to excavate or fill the formation to the design drawing levels, width, and crossfall levels. All works are to be carried out in accordance with MRTS04.

Bed/Subgrade is to be inspected for areas of unsuitable material (HOLD POINT)

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

All loose material is to be removed from excavations and/or slab bed and pavement subgrade.

Bed/subgrade preparation is to be carried out as per MRTS04 and is to be presented for inspection and proof roll for the Superintendent with inspections, geotechnical testing and geometric requirements applying unless stated otherwise in MRC Supplementary Specification Annexure 8208_1 Causeways. (HOLD POINT)

Where indicated on the design drawings select fill is to be supplied, delivered, laid and compacted to the levels, width, and crossfalls as detailed. Unless otherwise specified the minimum thickness shall be 150mm of unbound pavement Type 3.5 in accordance with MRTS05 and be compacted to 100%SDD.

h) Excavate and compact bed for culverts

Where culverts are shown and set out in the design drawings excavation shall be carried out in accordance with the requirements of MRTS03, with inspections, geotechnical testing and geometric requirements applying unless stated otherwise in MRC Supplementary Specification Annexure 8208_1 Causeways

Prior to bed preparation commencing all loose material is to be removed from excavations and/or culvert slab base. Bed/subgrade preparation is to be carried out as per MRTS04 and is to be presented for inspection by the Superintendent. (HOLD POINT)

i) Insitu poured base slab to reinforced concrete box culverts (RCBC) if required

Prior to the pouring of the culvert base slab and aprons a blinding layer is to be constructed as detailed in the design drawings and in accordance with DTMR Std Drawings SD-1250 and SD-1260 (HOLD POINT)



The Superintendent is to grant approval to proceed with the RCBC slab, the blinding layer shall be cured for a minimum of 7 days. All works are to be carried out in accordance with the design drawings, MRTS03, MRTS04, and DTMR Std Drawings SD-1250 and SD-1260.

Prior to pouring the base slab a prepour inspection of formwork and reinforcing is to be carried out. The Superintendent shall give approval to proceed with the pour. (HOLD POINT)

All concrete works associated with the base slab shall be carried out in accordance with MRTS70, MRC standard drawings, and the design drawings with inspections, geotechnical testing and geometric requirements applying unless otherwise in MRC Supplementary Specification Annexure 8208_1 Causeways.

The Superintendent shall give the approval to proceed with the placing of concrete. Finishing of the concrete is to be in accordance with the design drawings. Where the structure is a fish passage the finish is to be in accordance with DTMR Std Drawings SD1271. (WITNESS 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).

Where the contractor proposes alternatives to the design drawings this must be submitted and approved by the Superintendent.

j) Install and backfill reinforced concrete box culverts if required

Culverts shall be installed as required by the design drawings and works be carried out in accordance with MRTS03, DTMR Std drawings SD1250, SD1260, SD1270, and SD1271, with inspections, geotechnical testing and geometric requirements applying unless otherwise stated in MRC Supplementary Specification Annexure 8208_1 Causeways. (HOLD POINT)

Backfilling of culverts shall not commence until all the conformance and As Constructed Survey requirements have been met and notice of such works provided to the Superintendent (HOLD POINT)

Backfill materials and backfilling process shall be carried out in accordance with MRTS03, and MRTS04. Layers are to be laid and compacted on alternate sides of the culverts and in 150mm maximum compacted layers. (WITNESS POINT)

k) Concrete causeway slab setup and concrete pour

Bed/subgrade preparation for the causeway slab is to be carried out as per MRTS04, MRTS05, and is to be presented for inspection to the Superintendent with inspections, geotechnical testing and geometric requirements applying unless stated otherwise in MRC Supplementary Specification Annexure 8208_1 Causeways Annexure. The Superintendent shall grant approval to proceed with the causeway slab set up once all quality documentation has been submitted and is compliant with this specification. (HOLD POINT)

Prior to approval for placing the concrete in the designated section of causeway slab, 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 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 respective pours. (HOLD POINT)

All concrete works (including formwork and reinforcing) associated with the causeway slab shall comply with the design drawings and be carried out in accordance with MRTS70,



MRTS71, with inspections, geotechnical testing and geometric requirements applying unless otherwise in MRC Supplementary Specification Annexure 8208_1 Causeways.

The Superintendent shall give the approval to proceed with the placing of concrete. Finishing of the concrete is to be in accordance with the design drawings. (WITNESS 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 design drawings and approved by the Superintendent (HOLD POINT).

All joints are to be installed and sealed as per the design drawings (WITNESS POINT)

l) In situ poured aprons and nib walls, headwalls, and batter protection

Prior to the pouring of the aprons a blinding layer is to be installed as detailed in the design drawings and in accordance with DTMR Std Drawings SD-1250 and SD-1260 (HOLD POINT)

The Superintendent is to grant approval to proceed with the aprons. All works are to be carried out in accordance with the design drawings, MRTS03, MRTS04, and DTMR Std Drawings SD-1250 and SD-1260.

All concrete works (including formwork and reinforcing) associated with the aprons, nib walls, headwalls, and batter protection 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 8208_1 Causeways.

Prior to carrying out concrete works on the aprons, nib walls, headwalls, and batter protection 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)

The Superintendent shall give the approval to proceed with the placing of concrete. Finishing of the concrete is to be in accordance with the design drawings. Where the structure is a fish passage the finish is to be in accordance with DTMR Std Drawings SD1271. (WITNESS 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)

m) Riprap protection

Supply of rock materials and it's source shall be approved by the Superintendent prior to use, where possible existing materials shall be utilised as riprap. Riprap works to apron and batter protection to comply with the design drawings and to be carried out in accordance with MRTS03 Clause 35. (HOLD POINT)

n) Construction of roadway approaches to causeway

All works associated with transitioning and constructing the formation and pavement approaches from the saw cut of the existing pavement to the causeway shall be as detailed in



the design drawings and pavement design and shall be carried out in accordance with MRTS04 and MRTS05.

(Hold Point – subgrade for proof roll and HOLD POINT – Proof roll for both select fill layer and base pavement layer).

Adjoining swale drains shall be cleaned and reshaped as detailed in the design drawings, where there is an absence of detail the following table set out the treatment of the swale drains as applies to this specification.

Swale Drain Grade	Treatment
0.4% - 2%	Concrete lined
2% - 5%	Grass lined
5% - 10%	Rock lined
>10%	Concrete lined

Seal design is to be submitted to MRC 14 days prior to pavement proof roll being requested. (HOLD POINT)

An inspection of surface by the Superintendent 24 hours prior to seal works commencing shall be carried out with the Superintendent giving approval to proceed. (HOLD POINT)

Seal works are to be carried out as per the relevant MRT Specification and design drawings unless otherwise directed by the Superintendent.

Supply and install new road furniture and pavement markings as detailed in the design drawings and in accordance with MRTS14 and MRTS45. (HOLD POINT)

o) Clean site including side track

The site is to be cleaned of all debris, excavated material, and construction materials and returned to its natural state prior to works occurring.

Disturbed areas are to be rehabilitated as required by the design drawings and erosion and sediment control measures installed as per the Contractors approved Erosion and sediment control Plan and as directed by the Superintendent. (HOLD POINT)

8208.7 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.



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

b) Erosion and sediment control plan

ESC measures are to be kept in place and maintained until the Superintendent approves of the removal of such measures. (HOLD POINT)

8208.8 Measurement and Payment

Provision for these works shall be included in the scheduled unit rate for the items show in Clause 8208.3 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:

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1.0	Original issue		23.11.2021
2.0	Review of specification	C. Sultana	07.02.2024