Supplementary Specification

MRC Supplementary Specification 8201 Exposed Aggregate Concrete

Revision 3.0
January 2026

Contents

8201.1 Introduction

This supplementary specification refers to the bed preparation, supply of materials, placement, finishing, and sealing activities associated with the construction of exposed aggregate concrete.

8201.1.1 Definition of Terms

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

Term	Definition
Exposed Aggregate Concrete	Decorative concrete achieved by removing the top layer of cement paste and revealing the underlying aggregate, can include coloured concrete as part of the mix.
Formwork	For the purpose of this specification, refers to timber or steel material type forms with smooth surfaces that are sufficiently rigid to maintain tolerances specified as per MRTS70 Section 15.4
Slip Resistance	For the purpose of this specification, refers to the surface's ability to provide sufficient friction to reduce likelihood of pedestrian slips and falls under varying conditions (dry, wet, contaminated).

All other definitions refer to MRTS70 Concrete, and AS3600 & AS3610

8201.2 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*"
- MRS70 and MRTS71 "Reinforcing Steel"
- AS36000 *"Concrete Structures"* & AS3610 *"Formwork for Concrete"*
- AS 4586 "Slip Resistance Classification of New Pedestrian Surface Materials"
- AS 4671 *"Steel for the Reinforcement of Concrete"*
- HB 197 "An Introductory Guide to Slip Resistance of Pedestrian Surface Materials", and
- the project Drawings.

8201.3 Description of Work Items

Work items incorporated by this supplementary specification are identified in Section 8201.6 and 8201.7 with individual activities/tasks for measurement and payment sourced from the Bill of Quantities and listed in MRC Supplementary Specification Annexure 8201_1 Exposed Aggregate Concrete Section 1

8201.4 Quality System Requirements

8201.4.1 Std test Methods (Testing Regime)

The following minimum testing regime applies to this specification:

Civil works activities associated with the subgrade/floor of 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.

For all trafficable surfaces the Contractor shall carry out wet pendulum test slip resistance testing to AS 4586 for all new surfaces to meet the following requirements"

- Less than 5% grade – Classified Class 'P5' (>44 mean BPN using a slider 55 (TRL) Rubber Pad) to AS 4586
- Greater than 5 % grade – Mean BPN increased as per Appendix A HB197

8201.4.2 Hold Points, Witness Points and Milestones

8201.4.2.1 Milestone

Milestone is a point within a project which marks the start or completion of an activity or compliance requirement. Generally associated with provision of records or data for verification with the project's contract and specification.

8201.4.2.2 Hold Points

Hold points are noted on various Sections of this Specification.

"**HOLD POINTS**" are critical stages of the work, which require inspection by the Superintendent (or their nominated representative) and beyond which the Contractor will not be permitted to proceed without the written approval of the Superintendent.

A written "request for inspection" form shall be submitted to the Superintendent at least 48 hours prior to reaching the relevant "**HOLD POINT**". One copy shall be submitted for each inspection. The signed copy will be handed back to the Contractor after the inspection to sanction work to proceed to the next stage or noting what work must be done prior to re-inspection. This may involve inspection of the works by the Superintendent or approval of test results forwarded to the Superintendent by the Contractor.

8201.4.2.3 Witness Points

Witness points are also important stages of work. However, these are not necessarily critical work stages as defined by the hold points. Witness points are where the Superintendent (or their nominated representative) may review, witness, and inspect the work. The activities however may continue to proceed.

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

Activity	Inspection Type	When	Reference
Construction Procedure and other submissions as required by Clause 8105.5	Milestone	4 Weeks prior to works commencing	8201.5
Inspection of delivered items	Hold Point	At delivery time for each item.	8201.6.3
Layout survey	Witness Point	During site survey layout.	8201.6.4

Unsuitable material in foundation	Hold Point	As required during excavation inspection	8201.6.5
Bed/Subgrade Excavation Floor, prepared and compacted	Hold Point	At completion of excavation and compacting	8201.6.7
Formwork and reinforcing installation	Hold Point	Prior to concrete pour	8201.6.8
Concrete pre pour inspection	Hold Point	Approval to pour	8201.6.11
Placing of concrete and inclusion of joints	Witness Point	During pour activities	8201.6.11
Etching of surface for exposed aggregate finish	Witness Point	After Concrete has set and removal of fines will not dislodge larger aggregate	8201.6.12
Stripping of formwork approval	Hold Point	Not prior to 48 hours for side forms, 7 days for soffits, as required by Clause 15.8 of MRTS 70	8201.6.13
Defect inspection	Hold Point	Prior to backfilling	8201.6.14
Sealant application	Witness Point	Before and during application of sealant	8201.6.14
Slip resistance testing of sealed surface of pathway	Witness Point	Superintendent to be notified, witness and approve of locations of testing	8201.6.15
Approval to backfill	Hold Point	After defect inspection and any rectification required	8201.6.16
Backfilling and turfing to pathway	Witness Point	During backfilling and turfing process	8201.6.16
Submission of As Constructed documentation	Hold point	Four (4) weeks prior to requesting practical completion inspection	8201.7.1

8201.4.3 Construction Tolerances

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

The construction outcome must comply to the widths, lengths, heights, and shapes in this specification, or where not stated, those required by the relevant referenced specifications.

- Concrete tolerances shall comply with MRTS70 Concrete.
- Earthworks tolerances shall comply with MRTS04 General Earthworks.

Tolerances specific to the project are detailed on the design drawings and are included in Clause 2 of MRC Supplementary Specification Annexure 8201_1 Exposed Aggregate Concrete

8201.5 Preliminary

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

- Works procedure
- Environmental Plan
- Personnel experience
- Erosion and Sediment Plan (as required for site/s)
- Traffic Management Plan and TGSs
- Concrete Mix Design (as required)
- Formwork Design (as required)

Other requirements unique to the project will be listed in the MRC Supplementary Specification Annexure 8201_1 Exposed Aggregate Concrete

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The contractor is to ensure their works procedure/s are based on the design drawing requirements and this specification, its annexure, and manufacturer's requirements.

8201.5.1 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 8201_1 Exposed Aggregate Concrete Section 3 and shall be the point of supply.

8201.5.2 Concrete Mix Design

Concrete mix design shall be in accordance with MRTS70 with the addition of the following requirement.

The exposed aggregate concrete shall be an approved equivalent of colour details specified on project drawings. All mixes shall be uniform in colour and texture, and shall be batched continuously in sufficient quantities to fully cover the area being concreted, refer to Clause 5.5 where this does not occur.

In addition to the requirements of MRS03 and MRS70, the exposed aggregate concrete shall be supplied and constructed as per the following requirements:

a) The exposed aggregate concrete mix specified contain full depth aggregate and colour and are not produced by "seeding" a normal concrete mix.
b) As defined in AS2758.1 coarse aggregates shall have a nominal size not less than 5 mm and fine aggregates are of a nominal size of less than 5 mm. In addition, maximum size for aggregates for trafficable areas shall be limited to 10 mm and for other road applications 20 mm.
c) Topping mixes, bonded toppings and seeding surfaces with aggregate are not acceptable.
d) Pigments used in the cement matrix are to integrally mix into the concrete with the pigment as defined on the project drawings.

Submission for approval by the Superintendent is required 4 weeks prior to the concrete works commencing, this forms a Hold Point with approval to proceed required.

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8201.5.3 Formwork Design (as required)

Unless required for submission, Formwork shall be in accordance with MRTS70 and be of Timber or Steel forms. Any variation to this must be approved by the Superintendent 4 weeks prior to works commencing.

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All formworks must be sufficiently rigid to maintain tolerances specified for line and level so the finished concrete shall conform within the specified dimensional tolerances as per the project plans. If not specified on the project plans, then relevant MRC Standard Drawings apply.

8201.5.4 Construction Procedure

Council requires the submission of the contractor's construction procedure a minimum 4 weeks prior to works commencing, including proposed testing and inspection regimes.

As a minimum the construction process will include but not be limited to the following identified operations and cover the full exposed aggregate concrete activity of preparation, pouring, finishing, curing, and backfilling.

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8201.5.5 Acceptance and Rejection of Concrete

8201.5.5.1 Rejection of Concrete (Plastic – Non-Hardened)

Prior to concrete being placed it shall be visually checked and be rejected if the following apply:

a) The slump is outside the limits specified on the project plans and/or MRTS70.
b) The concrete contains significant lumps of unmixed material.
c) Appearance, colour, cohesiveness is significantly different to other batches delivered and placed.

8201.5.5.2 Rejection of Concrete (Hardened)

Concrete may be rejected based on strength as per MRTS70.

8201.5.5.3 Acceptance of Concrete

During the placing stage the consistency and workability of concrete shall be such that it can be handled and transported without segregation and can be placed, worked and compacted into all corners, angles and narrow sections of forms, and around all reinforcement during the placing stage.

The strength of the concrete passes all compression tests, and all test results are within the parameters of rejecting as laid out in MRTS70.

8201.5.5.4 Defects and Rectification

Where concrete does not comply with this specification the concrete shall be removed and replaced.

Where cracking has occurred rectification will be dependent on the size, type, and extent of cracking, and the cause. Any rectification method will be as per approval of the Superintendent.

8201.5.6 Contractor's Personnel

Personnel, sub-contractors and suppliers utilised in the placement and fishing of exposed aggregate concrete shall be experience in the processes and activities required to carry out the works.

The Contractor shall provide documented evidence for the Superintendent's approval to demonstrate the experience, qualification, skills and training of proposed personnel, sub-contractors a minimum 4 weeks prior to works commencing.

MILESTONE

8201.5.7 Environmental Plan

The Contractors Environmental Plan shall be reflective of the requirements of MRTS51 and MRS51 and be submitted for approval by the Superintendent 4 weeks prior to site works commencing.

MILESTONE

8201.5.7.1 General

The Contractor shall remove all rubbish, debris, disused materials etc., from the Site. The Site shall be maintained in a clean state.

The Contractor shall be responsible for ensuring no debris is deposited on public or private rights of way because of the works, including any deposits arising from the movement of plant and vehicles, and the exposing of aggregate process.

The Contractor shall keep pollution in the vicinity of the Works within reasonable minimum limits noting that this clause does not exempt the Contractor from complying with the limits controlled or required by legislation.

The Contractor shall collect, transport and dispose of waste at a registered waste facility.

8201.5.8 General Workplace Health and Safety Requirements

As a condition of this document, it is required that the Contractor and its workers (including all sub-contractors etc., and their workers) engaged to perform a service or work on site must at all times ensure (so far as reasonably practicable) the health and safety of all persons who are, or may be, affected by work under this Supplementary Specification or the services provided.

8201.5.8.1 Legislative Compliance

Without limiting the Contractor's other obligations, the Contractor must comply with all Acts, Regulations, Standards and Codes of Practice about work health and safety matters that are applicable to the scope of work undertaken or services being provided.

8201.6 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.

8201.6.1 Work Scope

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

- Procure, supply, and store all materials as required;
- Site Layout marked out and approval by Superintendent;
- Carry out excavation, including stripping and grubbing;
- Utilisation and/or disposal of excavated materials;
- Prepare foundation and bed;
- Set up formwork, reinforcing, joints, and packing for concrete pour;
- Pour and finish concrete, including exposed aggregate finish;
- Cure and seal concrete;
- Clean up and backfill against edge, including turfing (as required);
- Test finished surface for slip resistance;
- Collate and submit "As Constructed details.

8201.6.2 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.

8201.6.3 Supplying All Materials.

All materials, plant, and labour required to carry out the works under this Specification is to be supplied by the Contractor, where the shelter and furniture is 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

8201.6.4 Site layout with Superintendent

The final location of the proposed concrete works shall be marked out on site and shall be inspected and approved by the Superintendent prior to excavation commencing.

HOLD POINT

8201.6.5 Carrying Out Excavations, as required.

Site surveyed and marked out prior to excavation commencing.

Excavation of material to level and grade as per design plans, vertical tolerances shall not exceed +5mm/-10mm. Width to be +300mm of design width of the structure.

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.

8201.6.6 Utilising or Disposing of Surplus Excavated Material;

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

8201.6.7 Compacting Material at the Bottom of Excavations;

Compact the floor or surface as required by the design drawings and MRTS04, where there is a lack of detail the subgrade is to be compacted to 97% SDD and tested at a frequency of 1/200m2 (minimum 4/Lot), with all loose material is to be removed from the excavation.

The contractor shall install a bedding layer as required by the design drawings, where there is a lack of detail the bedding layer shall be as shown on MRC standard Drawing A2-00500. The bedding layer shall be compacted, where the layer is 100mm thick or greater testing shall be carried out as required by MRC Supplementary Specification 8408, or MRTS05 where type 2.4 gravel is laid and compacted.

Where testing has been deemed by the Superintendent as not being required the surface finish shall be firm homogenous and show no areas of loose material.

Where concrete is approved to be constructed directly on the ground surface or a foundation bedding a Polythene Sheeting is to be laid, a minimum 300mm beyond the concrete work.

Floor or surface preparation is to be carried out as required by the design drawings and as per MRTS04 and is to be presented for inspection by the Superintendent with inspections, geotechnical testing and survey requirements applying unless stated otherwise in MRC Supplementary Specification Annexure 8204_1 Hand Placed Fibre Reinforced Concrete Paving.

HOLD POINT

8102.6.8 Installation of Formwork

The Contractor shall only use formwork that has been included in their works procedure and approved by Superintendent.

Installed formwork has been installed to project drawings line, levels and shape, positional tolerance Horizontal +25/-5 mm's, Vertical +/-5 mm's.

Depth from bed/subgrade complies with project drawings design, the depth of concrete shall be +10/-3mm's when measured from the finished bed level to the top of the formwork.

HOLD POINT

8102.6.9 Fabricating and Placing Steel Reinforcement;

Reinforcing shall comply with project drawings and AS4671. Cover around reinforcing is to comply with project drawings and/or AS3600, this includes cover to formwork, tolerance of cover to reinforcing +10/-5mm's.

8102.6.10 Placing Compressible Packing;

Compressible packing or filler shall be installed as per project plans or where expansion joints are indicated within Council's Standard Drawings.

8102.6.11 Placing and Compacting Concrete;

Prior to approval for placing the concrete a pre-pour inspection of formwork and joints is to be carried out, 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 upon satisfactory pre-pour inspection outcome shall give the approval to proceed with the placing of concrete.

HOLD POINT

All concrete works (including formwork and reinforcing) associated with the exposed aggregate concrete shall comply with the mix design and the design drawings and be carried out in accordance with MRTS70, MRTS71, with inspections, geotechnical testing and survey requirements applying unless otherwise in MRC Supplementary Specification Annexure 8201_1 Exposed Aggregate Concrete.

Concrete delivered to site is as per the approved mix design, delivery dockets verify mix and target strength.

The exposed aggregate concrete mix specified and approved by the Superintendent shall contain full depth aggregate and colour and are not produced by "seeding" a normal concrete mix.

WITNESS POINT

Exposed aggregates incorporate a high aggregate content in the design for decorative purposes and shall not be pumped.

Offsite ready-mix batched concrete shall be discharged in place within the times of the batching process commencing indicated by Clause 10.5 of MRTS70. Site mixed concrete shall be discharged in place within 30 minutes of batching commencing. Concrete is to be placed with minimum drop height to minimise segregation, at no time should this be greater than 2m.

Testing for slump is to occur on every truck load with compressive strength testing as required by Clause 12 and 15 of MTRS70.

Compaction of concrete shall occur using a vibrating needle, with insertion directly perpendicular (up and down) to the finished surface and not more than 450mm apart for 5 – 15 seconds at each location., No dragging of needle along surface is permitted.

Vibrating against steel reinforcing should be avoided, no vibrating of formwork or tapping/hammering of formwork is to occur.

Depressions in the fresh concrete caused by foot traffic, or aluminium screeding tools, must be refilled with the concrete mix, not just surface slurry.

Care shall be taken to avoid uneven screeding that will cause 'screed-lines' of mortar and /or aggregate to become apparent when the surface has been washed. Over-screeding by an overlapping technique has been found to be an effective method to avoid this finishing problem.

Use placing methods that minimise plastic cracking. Closing plastic cracking by merely trowelling is not sufficient, as they will again be revealed after washing. If plastic cracking occurs during placement, they shall be closed by careful and efficient surface compaction before re-trowelling.

Construction and Contraction/Expansion Joints are to be incorporated as per the project plans or as per the Superintendents instructions.

WITNESS POINT

8201.6.12 Finishing and Curing Concrete;

Following the initial set of the concrete, the Contractor shall employ such methods as water washing, abrasive blasting, honing or acid etching to expose the aggregate to meet the surface texture requirements on the project drawings, the method shall be documented in the Contractors approved works procedure.

The treatment shall ensure an embedment depth for the aggregate of 60-80% of the aggregate size. All aggregate shall be well bonded in the cement matrix. The resultant residue from the treated surface shall be removed immediately from the pavement and any previously treated areas and is to be prevented from entering garden beds or the stormwater system. The Contractor shall detail the proposed method within their works procedure and where such methods as acid etching is carried out detail the disposal of the waste in their Environmental Plan.

WITNESS POINT

The process for stripping the veneer surfacing of concrete to produce exposed aggregate shall take place after the concrete surface has set sufficiently for the fines to be removed. The process is to follow the approved method with Environmental measures in place to capture the waste from the stripping process.

Immediately after concrete setting and the exposed aggregate surface finish is installed, one coat of an approved curing compound shall be applied to the surface in accordance with the manufacturer's recommendations, further curing shall continue for a minimum of 7 days. Plastic sheeting shall not be used as part of the curing process.

Prior to applying any surface sealant curing of the concrete shall be allowed to continue for 28 days. The Superintendent may approve of a specialty cure and seal product, however this method must be submitted and approved as part of the Contractors works procedure.

8201.6.13 Stripping of Formwork

Formwork is not to be stripped earlier than 72 hours for side forms, 7 days for soffits, and loading not to occur for 7 days, as required by Clause 15.8 of MRTS 70 or as per project plans as approved by the Superintendent.

HOLD POINT

8201.6.14 Sealing of Concrete Surface;

After the approved curing period has expired the concrete to be cleaned of all dirt, grime and stains, and shall be inspected for defects and must be rectified prior to the Superintendents approval to carry out sealing of the concrete.

HOLD POINT

Surface sealer to be applied no later than 1 day after stripping of formwork and curing of concrete, and shall consist of three (3) coats of a UV stable clear concrete sealer, approved by the Superintendent, and shall be applied in accordance with the manufacturer's recommendations, including curing periods between coats.

WITNESS POINT

8201.6.15 Slip Resistance Testing of Trafficked Surface

Upon completion of the curing period of the sealant the Contractor shall carry slip resistance testing in accordance with AS4586. The test results shall form part basis of works acceptance, and must notify the Superintendent of the proposed timing of the testing. All slip resistance testing shall be carried out by a NATA registered practitioner/laboratory.

WITNESS POINT

Tests results shall be submitted to the Superintendent within 24 hours of the testing being carried out, unless otherwise agreed to by the Superintendent no traffic shall be allowed onto the surface until the Superintendent approves of the results.

8201.6.16 Backfilling and Turfing Against Structure;

Backfilling to structure is not to occur until after the sealing process has taken place and the sealant has hardened/set and cured.

HOLD POINT

Backfilling and turfing to be carried out in accordance with MRC Supplementary Specification 8300 unless otherwise stated in Annexure 8201_1, and left 10mm below level of concrete finished level.

WITNESS POINT

8201.7 Post Construction

Items which close out the project, and readies the project for the "On Maintenance" inspection. All items below **MUST** be complied with prior to the Contractor requesting an "On Maintenance" inspection and/or as required during the Defects/Liability (On Maintenance) period.

8201.7.1 Collection and Submission of all As Constructed Data.

Contractor is to supply and submit "As Constructed" 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.

8201.8 Measurement and Payment

Provision for these works shall be included in the scheduled unit rate for the items show in Clause 8201.3 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	MRC	07.12.2021
2.0	Review of specification	C. Sultana	10.01.2024
3.0	Review of Specification	C. Sultana	10.01.2026