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REVISION REGISTER

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<th>Ed/Rev Number</th>
<th>Clause Number</th>
<th>Description of Revision</th>
<th>Authorised By</th>
<th>Date</th>
</tr>
</thead>
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<tr>
<td>Ed 1/Rev 0</td>
<td></td>
<td>First issue</td>
<td>GM, IC W Stalder</td>
<td>08.07.11</td>
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GRANULATED GLASS AGGREGATE
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FOREWORD

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BASE SPECIFICATION

This document is based on Specification RMS 3154 Edition 1 Revision 0.
RMS SPECIFICATION D&C 3154
GRANULATED GLASS AGGREGATE

1 Scope

This Specification sets out the requirements for granulated glass for use as fine aggregate in road pavement materials.

2 Structure of the Specification

This Specification includes a series of annexures that detail additional requirements.

2.1 (Not Used)

2.2 Schedules of Hold Points and Identified Records

The schedules in Annexure 3154/C list the Hold Points that must be observed. Refer to Specification RMS D&C Q6 for the definition of Hold Points.

The records listed in Annexure 3154/C are Identified Records for the purposes of RMS D&C Q6 Annexure Q/E.

2.3 Frequency of Testing

The minimum frequency of testing is shown in Annexure 3154/L.

2.4 Referenced Documents

Standards, Specifications and test methods are referred to in abbreviated form (e.g. AS 1234). For convenience, the full titles are given in Annexure 3154/M.

3 Definitions

In this Specification, granulated glass aggregate is also referred to as “granulated glass”.

A Lot is a stockpile or multiple stockpiles with the same source properties and the same production parameters.

The term “the Supplier” means the supplier of the product covered by the scope of this Specification.
4 **SUPPLIER’S QUALITY MANAGEMENT SYSTEM**

The Supplier must establish and maintain a Quality Management System complying with AS/NZS ISO 9001 as a means of ensuring that the product conforms to this Specification.

Provide evidence verifying compliance with this Clause.


5 **MATERIALS**

The granulated glass aggregate must be free from contaminants as detailed in Table 2 of The Recovered Glass Sand Exemption 2010. It must also be free of any putrid odour.

Test each type and source of granulated glass separately.

All materials must maintain conformity and have a uniform appearance for the duration of the Works.

5.1 **SOURCE**

Granulated glass is primarily crushed container glass, and must not include glass from:

(a) ceramics;
(b) cathode ray tubes;
(c) fluorescent light fittings;
(d) laboratory glassware.

5.2 **QUALITY**


Granulated glass must also comply with the requirements in Table 3154.1.
### Table 3154.1 – Material Requirements

<table>
<thead>
<tr>
<th>Property</th>
<th>Acceptance Criteria</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particle size distribution:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominated particle size distribution envelope</td>
<td>Within the nominated particle size distribution envelope</td>
<td>AS 1141.11</td>
</tr>
<tr>
<td>Material finer than 75 µm</td>
<td>Report</td>
<td>AS1141.12</td>
</tr>
<tr>
<td>(a) Dry density</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Percentage of oversize material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) Flow Time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d) Uncompacted void content</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water absorption</td>
<td>≤ 1.0%</td>
<td>AS 1141.5</td>
</tr>
<tr>
<td>(a) Dry Particle Density</td>
<td>Report for all properties</td>
<td>RMS T279</td>
</tr>
<tr>
<td>(b) SSD Density</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 6 NOMINATED GRANULATED GLASS

The nominated granulated glass submission is a statement of the quality of the granulated glass that:

(a) will satisfy the requirements of this Specification, and

(b) will be targeted during production and supply.

### 6.1 SUBMISSION OF NOMINATED GRANULATED GLASS

For each nominated granulated glass, submit to the RMS Representative the following details:

(a) **Glass Characteristics:**

(i) Source(s).

(ii) Production plant and methods of managing materials.

(iii) Evidence that the source and methods proposed are adequate for the required quantity and quality of granulated glass.

(iv) Nominated target values for each property specified in Table 3154.1, including:

(A) Nominated particle size distribution for each granulated glass.

(B) Particle size distribution envelop for each granulated glass with maximum tolerance specified in Table 1 of AS 2758.5.

(C) Apparent, dry and SSD density.

(D) Flow time.

(E) Uncompacted void content.

(F) Water absorption.

(b) Production Trial:
   (i) Test results of a trial production by the plant from which the granulated glass will be supplied. Submit such test results for each material requirement in Table 3154.1.
   (ii) For each nominated granulated glass, all tests specified in Table 3154.1 must be from the same trial production.

(c) Signed Statement:
Supply a signed statement confirming that each nominated granulated glass meets the requirements of Clause 5. The statement must include NATA endorsed test results for all specified tests. Attach a copy of the completed verification checklist.

Carry out all tests relating to the submission within a three month period prior to the date of submission to the RMS Representative. All phases of any particular test must be performed at the same laboratory.

6.2 PROPRIETARY INFORMATION

This Specification sets out the minimum technical standards and requires details of granulated glass, plant and quality verification to be provided.

Clearly identify detail(s) not provided because it is considered to be proprietary information.

<table>
<thead>
<tr>
<th>HOLD POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Held:</td>
</tr>
<tr>
<td>Submission Details:</td>
</tr>
<tr>
<td>Release of Hold Point:</td>
</tr>
</tbody>
</table>

7 PROCESS CONTROL

Employ a capable process and implement process control. The method of process control may be audited by the RMS Representative.

8 CONFORMITY

8.1 HOMOGENEITY

Rectify and replace granulated glass that exhibits segregation and/or contamination.

8.2 SAMPLING

Nominate all sampling locations, frequencies and methods in the PROJECT QUALITY PLAN. Samples must be representative of materials supplied to the RMS Representative.
When the RMS Representative requests samples, riffle and/or quarter the samples taken for testing, and deliver the samples in sealed and labelled containers.

8.3 TESTING

8.3.1 Minimum Frequency of Testing

The PROJECT QUALITY PLAN must nominate the frequency of testing which must not be less than the minimum specified in Annexure 3154/L of this Specification. Where a minimum frequency of testing is not specified, nominate an appropriate frequency.

You may nominate a reduced minimum frequency of testing in accordance with RMS D&C Q6. Support your nomination by a statistical analysis verifying consistent process capability and product characteristics.

In the event of a nonconformity, a reduced frequency of testing must revert immediately to the specified minimum frequency of testing.

8.3.2 Maximum Lot Size

The maximum Lot size must be in accordance with RMS D&C Q6 and, notwithstanding RMS D&C Q6, must not exceed 500 tonnes.

8.4 NONCONFORMITIES

If a Lot fails to conform to this Specification, such failure constitutes a “Nonconformity” under the deed.

Remove nonconforming granulated glass from the work and from the RMS Representative’s premises.

Rectified and replacement granulated glass must conform to this Specification.
ANNEXURES 3154/A AND 3154/B – (NOT USED)

ANNEXURE 3154/C – SCHEDULES OF HOLD POINTS AND IDENTIFIED RECORDS

Refer to Clause 2.2.

C1 SCHEDULE OF HOLD POINTS

<table>
<thead>
<tr>
<th>Clause</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Supply of nominated granulated glass</td>
</tr>
</tbody>
</table>

C2 SCHEDULE OF IDENTIFIED RECORDS

The records listed below are Identified Records for the purposes of RMS D&C Q6 Annexure Q/E.

<table>
<thead>
<tr>
<th>Clause</th>
<th>Description of Identified Record</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>All records necessary to comply with Protection of the Environmental Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A – The recovered glass sand exemption 2010</td>
</tr>
<tr>
<td>5.2</td>
<td>Purchaser’s specification for nominal particle size distribution</td>
</tr>
<tr>
<td>6.1</td>
<td>Nominated granulated glass submission</td>
</tr>
<tr>
<td>6.2</td>
<td>Proposals to withhold proprietary information</td>
</tr>
<tr>
<td>8.3.1</td>
<td>Test reports of all specified properties and characteristics at the minimum frequency of testing</td>
</tr>
<tr>
<td>8.3.1</td>
<td>Nominated reduced frequency of testing</td>
</tr>
</tbody>
</table>
ANNEXURES 3154/D TO 3154/K – (NOT USED)

**ANNEXURE 3154/L – MINIMUM FREQUENCY OF TESTING**

Refer to Clause 2.3.

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Minimum Frequency of Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particle size distribution:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The nominated particle size distribution.</td>
<td>AS 1141.11</td>
<td>2 per Lot</td>
</tr>
<tr>
<td>Material finer than 75 µm</td>
<td>AS 1141.12</td>
<td>2 per Lot</td>
</tr>
<tr>
<td>(a) Dry density</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Percentage of oversize material</td>
<td>RMS T279</td>
<td>1 per Lot</td>
</tr>
<tr>
<td>(c) Flow Time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d) Uncompacted Void Content</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water absorption</td>
<td>AS 1141.5</td>
<td>One test every 3 months</td>
</tr>
<tr>
<td>(a) Dry Particle Density</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) SSD Density</td>
<td>AS 1141.5</td>
<td>One test every 3 months</td>
</tr>
</tbody>
</table>
ANNEXURE 3154/M – REFERENCED DOCUMENTS

Refer to Clause 2.4.

RMS Specifications

RMS D&C Q6  Quality Management System (Type 6)

RMS Test Method

RMS T279  Flow Time and Voids Content of Fine Aggregate by Flow Cone

Australian Standards

AS 1141  Methods for sampling and testing aggregates
AS 1141.5  Particle density and water absorption of fine aggregate
AS 1141.11  Particle size distribution – Sieving method
AS 1141.12  Materials finer than 75 micrometre in aggregates (by washing)

NSW Government Regulations

Protection of the Environmental Operations (Waste) Regulation 2005 – General
Exemption Under Part 6, Clause 51 and 51A – The recovered glass sand
exemption 2010