

Technical Specification

**Transport and Main Roads Specifications
MRTS102 Reclaimed Asphalt Pavement Material**

March 2019

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1 Introduction

This Technical Specification sets out the requirements for reclaimed asphalt pavement (RAP) material that is used in asphalt.

This Technical Specification shall be read in conjunction with MRTS01 *Introduction to Technical Specifications*, MRTS50 *Specific Quality System Requirements* and other Technical Specifications as appropriate.

This Technical Specification forms part of the Transport and Main Roads Specifications Manual.

2 Definition of terms

The terms used in this Technical Specification are as defined in Clause 2 of MRTS01 *Introduction to Technical Specifications*, and Table 2 of this Technical Specification.

Table 2 – Definition of terms

Term	Definition
Asphalt Mix Design Registrar	Person(s) nominated by the Deputy Chief Engineer (Pavements, Materials and Geotechnical) to register asphalt mix designs for use on Department of Transport and Main Roads projects
Reclaimed asphalt pavement material	Asphalt which has been milled or excavated from existing asphalt pavements, or returned from job sites

3 Referenced documents

Table 3 lists the documents referenced in this Technical Specification.

Table 3 – Referenced documents

Reference	Title
AGPT/T191	<i>Extractions of bituminous binder from asphalt</i>
AGPT/T192	<i>Characterisation of the viscosity of reclaimed asphalt pavement (RAP) binder using the dynamic shear rheometer (DSR)</i>
AS 1141.3.1	<i>Methods for sampling and testing aggregates – Sampling – Aggregates</i>
AS/NZS 2891.3.1	<i>Methods of sampling and testing asphalt – Binder content and aggregate grading – Reflux method</i>
RMS T276	<i>Foreign materials content of recycled crushed concrete</i>

4 Standard test methods

The standard test methods listed in Table 4 shall be used in this Technical Specification.

Further details of test numbers and test descriptions are given in Clause 4 of MRTS01 *Introduction to Technical Specifications*.

Table 4 – Standard test methods

Property to be Tested	Test Method No.
Sampling of aggregates	AS 1141.3.1 or Q060
Binder content and grading	Q308A or AS/NZS 2891.3.1
Extraction of bituminous binder from RAP	AGPT/T191
Characterisation of the viscosity of reclaimed asphalt pavement (RAP) binder	AGPT/T192

5 Quality system requirements

5.1 General

The Contractor shall develop and implement documented procedures for all construction processes as defined in Clause 6 of MRTS50 *Specific Quality System Requirements*.

The Contractor shall submit to the Administrator a detailed RAP management plan not less than seven days prior to the commencement of asphalt production. **Milestone** A copy of the RAP management plan shall also be submitted to the Asphalt Mix Design Registrar as part of the Contractor's mix design submission. The plan shall include detailed procedures and inspection and test plans (ITPs) for the excavation, processing and stockpiling of RAP.

5.2 Hold Points, Witness Points and Milestones

General requirements for Hold Points, Witness Points and Milestones are specified in Clause 5.2 of MRTS01 *Introduction to Technical Specifications*. The Hold Points, Witness Points and Milestones applicable to this Technical Specification are summarised in Table 5.2.

Table 5.2 – Hold Points, Witness Points and Milestones

Clause	Hold Point	Witness Point	Milestone
5.1			Submission of RAP management plan

5.3 Conformance requirements

The conformance requirements that apply to this Technical Specification are summarised in Clause 6.

6 Materials

RAP materials must comply with the following requirements:

- They must be sourced totally from asphalt and must not contain any foreign materials such as road base, concrete, coal tar, plastics, brick, timber, scrap rubber etc as defined in Test Method RMS T276, and must be free from dust, clay, dirt and other deleterious matter.
- The aggregates must be hard, sound and durable and conform to the requirements of Tables 7.1 and 7.2 of MRTS101 *Aggregates for Asphalt*. The particle size distribution and materials finer than 75 µm must be determined on the total fraction after removal of the binder using toluene.
- Where > 15% by mass of RAP is included in an asphalt mix and Method 1 (as defined in Clause 7.1.6 of MRTS30 *Asphalt Pavements*) is used to control the binder blend viscosity, the binder content of the RAP material shall be $4.1 \pm 0.5\%$.

7 Process control

Production of RAP material must be subject to process control in accordance with Clauses 7.1 to 7.5.

7.1 Processing

Reclaimed asphalt pavement material must be blended, crushed and screened to ensure that:

- a) 100% passes the 26.5 mm AS sieve
- b) it is free flowing with consistent particle size distribution and complying with the tolerances specified in Table 7.3 of MRTS101 *Aggregates for Asphalt*, and
- c) it has minimal fracture of aggregate particles.

7.2 Stockpiling

At the processing site, separate stockpiles shall be established for processed and unprocessed RAP material. Each processed stockpile must not exceed 1,000 tonnes.

7.3 Transport of processed material from the processing site to the asphalt plant

Processed RAP material shall be transported from the processing site to the asphalt plant in a manner such that there is:

- a) no segregation or contamination of the processed RAP material
- b) no adverse impact on productivity, and
- c) no change in the mix during production.

7.4 Stockpiles at asphalt plant

At the asphalt plant:

- a) each stockpile of processed RAP material must not exceed 500 tonnes
- b) stockpiles must be configured to prevent contamination, and
- c) each stockpile must remain free flowing without agglomeration of the material prior to use.

Where RAP material in a stockpile is found to contain lumps or is not free flowing, it must not be used in asphalt production. Such materials may be processed to comply with this Technical Specification.

7.5 Traceability of material in asphalt production

The RAP material used in asphalt production must be traceable to a designated stockpile.

8 Material conformance

Conformance of the RAP material with this Technical Specification shall be verified by sampling and testing, and providing records of process control.

8.1 Homogeneity

The Contractor's procedures, as detailed in their RAP management plan, must ensure the distribution of RAP aggregate in each stockpile is visually homogeneous and meets the requirements to control moisture content in stockpiles.

8.2 Sampling

All samples for testing must be taken from stockpiles as described in the Contactor's ITP. Sampling shall be undertaken in accordance with AS 1141.3.1 or Q060. The Contractor shall carry out sampling and testing within a two week period prior to the incorporation of RAP in the asphalt manufacturing process.

8.3 Testing

8.3.1 Minimum frequency of testing

Minimum testing frequencies for coarse and fine aggregate properties of RAP shall be nominated by the Contractor in accordance with the requirements of Clause 8.5 of MRTS50 *Specific Quality System Requirements*.

Unless otherwise stated on the asphalt mix design register, the frequency of testing for the processed RAP material must not be less than the minimum specified in Table 8.3.1.

Table 8.3.1 – Minimum testing frequencies for processed RAP

Material Property	Minimum Frequency of Testing
Binder content and aggregate grading	1 per 500 tonnes
Recovered binder viscosity of RAP ¹	1 per 500 tonnes

¹ Testing is only required where:

- the percentage of RAP binder exceeds 15% of the total binder in the mix, and
- method 2, as defined in Clause 7.1.6 of MRTS30, is used to control the binder blend viscosity of the mix.

8.3.2 Maximum lot size

The maximum lot size must conform to the requirements of MRTS50 *Specific Quality System Requirements* and, notwithstanding these requirements, must not exceed the quantities specified in Clause 7.

8.4 Nonconformances

If a lot fails to conform to this Technical Specification, such failure will constitute a nonconformance under the Contract. A nonconforming lot shall not be used in the production of asphalt.

