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Specification (Measurement)

**Transport and Main Roads Specifications
MRS30 Asphalt Pavements**

July 2015

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1 Introduction

This Specification applies to the construction of asphalt pavements using the following asphalt types:

- a) Medium duty dense graded asphalt (AC7M, AC10M, AC14M and AC20M)
- b) Heavy duty dense graded asphalt (AC7H, AC10H, AC14H and AC20H)
- c) Open graded asphalt (OG10 and OG14), and
- d) Stone mastic asphalt (SMA10 and SMA14).

This Specification shall be read in conjunction with MRS01 *Introduction to Specifications* and other Specifications as appropriate.

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

2 Measurement of work

2.1 Standard Work Items

In accordance with the provisions of Clause 2 of MRS01 *Introduction to Specifications*, the Standard Work Items covered by this Specification are listed in Table 2.1.

Table 2.1 - Standard Work Items

Standard Item No.	Description	Unit of Measurement
Preparation of the Existing Surface		
5401	Preparation of the existing surface	m ²
5402P	Crack filling (Provisional Quantity)	m
5403P	Strain alleviating membrane fabric strips (Provisional Quantity)	m
5404P	Tack coat, residual bitumen (Provisional Quantity)	litre
Medium Duty Dense Graded Asphalt		
4156	Medium duty dense graded asphalt in corrector course, AC [nominal size] M mix	tonne
4157	Medium duty dense graded asphalt in base course, AC [nominal size] M mix	tonne
4158	Medium duty dense graded asphalt in intermediate course, AC [nominal size] M mix	tonne
4159	Medium duty dense graded asphalt in surfacing course, AC [nominal size] M mix	tonne
Heavy Duty Dense Graded Asphalt		
4161	Heavy duty dense graded asphalt in corrector course, AC [nominal size] H mix	tonne
4162	Heavy duty dense graded asphalt in base course, AC [nominal size] H mix	tonne
4163	Heavy duty dense graded asphalt in intermediate course, AC [nominal size] H mix	tonne
4164	Heavy duty dense graded asphalt in surfacing course, AC [nominal size] H mix	tonne

Standard Item No.	Description	Unit of Measurement
Open Graded Asphalt		
4165	Open graded asphalt in surfacing course, OG [<i>nominal size</i>] mix	tonne
Stone Mastic Asphalt		
4166	Stone mastic asphalt in surfacing course, SMA [<i>nominal size</i>] mix	tonne
4167	Supply and application of grit to the surface of stone mastic asphalt	tonne

2.2 Work Operations

Item 5401 Preparation of the existing surface

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) cutting back existing adjoining pavement to a vertical face
- c) cleaning/sweeping the existing surface
- d) treatment of surface imperfections, and
- e) removal of raised extruded thermoplastic road markings and raised pavement markers.

Item 5402 Crack filling (Provisional Quantity)

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply of crack sealant, and
- c) cleaning and filling of cracks.

Item 5403P Strain alleviating membrane fabric strips (Provisional Quantity)

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply of all materials
- c) preparing existing surfaces
- d) applying bituminous emulsion or proprietary primer, and
- e) installing strain alleviating membrane fabric strips.

Item 5404P Tack coat, residual bitumen (Provisional Quantity)

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) supply and application of tack coat.

Item 4156 Medium duty dense graded asphalt in corrector course, AC [*nominal size*] M mix

Item 4157 Medium duty dense graded asphalt in base course, AC [*nominal size*] M mix

- Item 4158 Medium duty dense graded asphalt in intermediate course, AC [nominal size] M mix**
- Item 4159 Medium duty dense graded asphalt in surfacing course, AC [nominal size] M mix**
- Item 4161 Heavy duty dense graded asphalt in corrector course, AC [nominal size] H mix**
- Item 4162 Heavy duty dense graded asphalt in base course, AC [nominal size] H mix**
- Item 4163 Heavy duty dense graded asphalt in intermediate course, AC [nominal size] H mix**
- Item 4164 Heavy duty dense graded asphalt in surfacing course, AC [nominal size] H mix**
- Item 4165 Open graded asphalt in surfacing course, OG [nominal size] mix**
- Item 4166 Stone mastic asphalt in surfacing course, SMA [nominal size] mix**

Work Operations incorporated in the above items include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) being a prequalified asphalt contractor or engaging a subcontractor who is a prequalified asphalt supplier
- c) having a registered mix design or obtaining a registered mix design
- d) manufacture of asphalt in accordance with the registered mix design(s)
- e) delivery of asphalt to the Works
- f) laying, compacting and finishing the asphalt
- g) providing an allowance for asphalt used in temporary ramps and asphalt lost from cut-offs from joints
- h) provision of laboratory and compliance testing facilities
- i) sampling, testing and quality assurance requirements
- j) delivery of the results for all tests and inspections to the Administrator by the nominated time, and
- k) removal and disposal of any nonconforming material or product, or any material or product not utilised for a reduced level of service, and replacement with conforming material or product.

Where paving open graded and stone mastic asphalt over an existing pavement with levels specified, a dense graded asphalt layer should be placed first.

For new pavements, finished surface levels are typically specified and are shown on the Drawings.

For asphalt placed over existing pavement (including mill and fill situations), the finished surface levels may or may not be specified. Where these levels are specified, they are shown on the Drawings and 'levels specified' is nominated in the relevant work item(s).

Item 4167 Supply and application of grit to the surface of stone mastic asphalt

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) winning and processing of the material, and
- c) loading, delivery, stockpiling, hauling, spreading and rolling of the grit.

2.3 Calculation of quantities

2.3.1 Preparation of the existing surface

The preparation of the existing surface shall be measured as the area over which the asphalt is laid.

2.3.2 Tack coat

The quantity of the tack coat, as residual bitumen at 15°C, shall be determined from the area on which the tack coat is placed and the nominated application rate of residual bitumen.

2.3.3 Asphalt

The quantity of asphalt incorporated in the final work must be mutually agreed using the tally of the weighbridge docket of delivered asphalt less:

- a) the quantity of asphalt which does not remain in the Works (such as asphalt in temporary ramps, cut-off joints and spillages or that remaining on or in construction plant), and
- b) any amount of asphalt which exceeds the upper vertical and horizontal geometric tolerances but is accepted to remain in the Works by the Administrator.

Weighbridge dockets must be issued at a certified weighbridge and collected at the point of delivery.

3 Utilisation of a rejected lot for a reduced level of service

The Contractor may elect to approach the Principal, via the Administrator, with a written proposal about how rejected lots, or rejected lots not accepted for a reduced level of service, may be retained. If accepted, the relevant details about the outcome should be captured on the TMR asphalt warranty register.

3.1 Acceptance of nonconformances

Pre-determined acceptance criteria in the form of payment deduction(s), as provided in this Specification, may be applied to nonconformances for the following properties:

- a) particle size distribution and binder content in asphalt
- b) insitu air voids, and
- c) ride quality.

Deductions apply to the scheduled rate for the quantity of asphalt represented by the test sample (lot or sub-lot as appropriate).

The requirements of Clause 1.2 of MRTS30 still apply to asphalt accepted for utilisation at a reduced level of service under this Clause.

TMR may accept asphalt for utilisation at a reduced level of service based on the requirements of Clause 3.1 being satisfied. However, it may not be appropriate to apply these pre-determined dispositions for specific high risk / high profile projects. Where it is determined that application of these pre-determined dispositions is not appropriate, it will be stated elsewhere in the Contract that the requirements of Clause 3.1 do not apply.

3.2 Combined particle size distribution and binder content

Deductions in accordance with Table 3.2 will be applied to accepted nonconformances in combined particle size distribution and binder content provided that:

- for any individual sieve size or binder content, nonconformances greater than twice the production tolerance specified in Table 7.4.3.2 of MRTS30 will not be accepted
- deductions are cumulative and nonconformances will not be accepted if the combined particle size distribution and binder content deductions exceed 20%, and
- for stone mastic asphalt, acceptance of nonconformances on the 4.75 mm sieve for SM14 and 2.36 mm sieve for SM10 is subject to the mix volume ratio being ≤ 1.04 .

Table 3.2 - Deductions for particle size distribution and binder content nonconformances

Combined Particle Size Distribution Element	% by which Nonconformance exceeds Production Tolerance	Combined Particle Size Distribution Element
	(% by mass of total aggregate)	
Passing 37.5 mm	Each 2 or part thereof	1
Passing 26.5 mm	Each 2 or part thereof	1
Passing 19.0 mm	Each 2 or part thereof	1
Passing 13.2 mm	Each 2 or part thereof	1
Passing 9.50 mm	Each 2 or part thereof	1
Passing 6.70 mm	Each 2 or part thereof	1
Passing 4.75 mm	Each 2 or part thereof	1
Passing 2.36 mm	Each 1 or part thereof	1
Passing 1.18 mm	Each 1 or part thereof	1
Passing 0.600 mm	Each 1 or part thereof	1
Passing 0.300 mm	Each 1 or part thereof	2
Passing 0.150 mm	Each 0.5 or part thereof	2
Passing 0.075 mm	Each 0.5 or part thereof	2
Binder Content	(% by mass of total asphalt mix)	
All asphalt mix	Each 0.1 or part thereof	3

3.3 *In situ air voids*

Deductions in accordance with Table 3.3 will be applied to nonconformances in excess of the upper limit of the characteristic value of in situ air voids (V_u), provided the nonconformance does not exceed the limit specified in Table 9.2.1 of MRTS30 by more than 2.0%.

Table 3.3 – Deductions for nonconforming in situ air voids

In situ Air Voids in Excess of Specified Limit V _u by (%)	Deduction (% of Lot Value)
≤ 0.5	2.5
0.6 - 1.0	7.5
1.1 - 1.5	15
1.6 - 2.0	30

3.4 *Ride quality*

Deductions in accordance with Table 3.4 will be applied to accepted nonconformances in ride quality provided that the roughness count does not exceed the specified limit by more than 20 counts per kilometre.

Table 3.4 - Deductions for ride quality

Ride Quality in Excess of Specified Limit by (counts/km)	Deduction (% of Lot Value)
≤ 5	2
6 - 10	4
11 - 15	8
16 - 20	16

Calculation of surface roughness should accurately represent the ride quality of the complete pavement. It is generally accepted that the inclusion of other road features within the pavement are likely to reduce ride quality.

In accordance with the test method adopted, these features are required to be noted during roughness testing. In accordance with MRTS30, the following features are allowed to be excluded from ride quality assessment:

- roundabouts
- railway lines
- bridge joints, and
- inspection pit covers (for example, drainage manholes).

The Contractor should nominate a methodology and provide calculations on ride quality for the Administrators acceptance, showing how each feature has been excluded from the assessment and the subsequent lot structure.

Under no circumstances should pavement features including joints or signalised/unsignalised intersections be excluded from the ride quality assessment without the express agreement of the Administrator.

4 Incentives

Pre-determined asphalt surface course ride quality incentives shall be applied in accordance with Table 4.

TMR typically pays an incentive for achieving a higher standard of ride quality provided the requirements of Clause 4 are satisfied. However, it may not be appropriate to apply these pre-determined incentives for specific projects. Where it is determined that application of these pre-determined incentives is not appropriate, it will be stated elsewhere in the Contract that the requirements of Clause 4 do not apply.

Table 4 - Incentives for ride quality

Ride Quality below the Specified Limit by (counts/km)	Incentive (% of Lot Value)
≤ 10	0
11 - 15	1
16 - 20	2
> 20	3

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