

Superseded

**Specification (Measurement)**

**Transport and Main Roads Specifications  
MRS11 Sprayed Bituminous Surfacing (Excluding  
Emulsion)**

**January 2017**

Superseded

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## 1 Introduction

This Specification applies to the application of sprayed bituminous surfacing but excludes the use of emulsions. The work covered includes primes, primerseals, seals, reseals and enrichments.

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
<b>Sprayed Bituminous Surfacing (excluding Emulsion)</b>		
5101	Prime, grade [ <i>grade</i> ], spray rate [ <i>spray rate</i> ], [ <i>including</i>   <i>excluding</i> ] supply of binder, [ <i>location</i> ]	litre
5102	Primerseal, grade [ <i>grade</i> ], spray rate [ <i>spray rate</i> ], [ <i>including</i>   <i>excluding</i> ] supply of binder, [ <i>location</i> ]	litre
5103	Seal, class [ <i>class</i> ], spray rate [ <i>spray rate</i> ], [ <i>including</i>   <i>excluding</i> ] supply of binder, [ <i>location</i> ]	litre
5104	Reseal, class [ <i>class</i> ], spray rate [ <i>spray rate</i> ], [ <i>including</i>   <i>excluding</i> ] supply of binder, [ <i>location</i> ]	litre
5105	Enrichment, grade [ <i>grade</i> ], spray rate [ <i>spray rate</i> ], [ <i>including</i>   <i>excluding</i> ] supply of binder, [ <i>including</i>   <i>excluding</i> ] supply of additives, [ <i>location</i> ]	litre
5106	SAMI seal, class [ <i>class</i> ], spray rate [ <i>spray rate</i> ], [ <i>including</i>   <i>excluding</i> ] supply of binder, [ <i>location</i> ]	litre
5107P	Supply and addition of adhesion agent (Provisional Quantity)	litre
5108P	Supply and addition of cutter oil (Provisional Quantity)	litre
5111	Spreading prime cover material [ <i>material</i> ], [ <i>spread rate</i> ], [ <i>location</i> ]	m <sup>3</sup>
5112	Spreading cover aggregate [ <i>size</i> ], [ <i>spread rate</i> ], [ <i>location</i> ]	m <sup>3</sup>
5121	Supply of bituminous material [ <i>material</i> ], [ <i>class</i>   <i>grade</i> ]	litre
5131	Transport of bituminous material supplied by the Principal [ <i>material</i> ], from [ <i>supply location</i> ]	litre
5132	Transport of aggregate supplied by the Principal [ <i>material</i> ], from [ <i>supply location</i> ]	m <sup>3</sup>
5141	Sprayed bituminous surfacing, [ <i>including</i>   <i>excluding</i> ] supply of binder, [ <i>including</i>   <i>excluding</i> ] supply of additives, [ <i>including</i>   <i>excluding</i> ] supply of cover aggregates, [ <i>location</i> ], refer to Clause 2 of Annexure MRTS11.1	m <sup>2</sup>

## 2.2 Work Operations

- Item 5101** Prime, grade [*grade*], spray rate [*spray rate*], [*including / excluding*] supply of binder, [*location*]
- Item 5102** Primerseal, grade [*grade*], spray rate [*spray rate*], [*including / excluding*] supply of binder, [*location*]
- Item 5103** Seal, class [*class*], spray rate [*spray rate*], [*including / excluding*] supply of binder, [*location*]
- Item 5104** Reseal, class [*class*], spray rate [*spray rate*], [*including / excluding*] supply of binder, [*location*]
- Item 5105** Enrichment, grade [*grade*], spray rate [*spray rate*], [*including / excluding*] supply of binder, [*including / excluding*] supply of additives, [*location*]
- Item 5106** SAMI seal, class [*class*], spray rate [*spray rate*], [*including / excluding*] supply of binder, [*location*]

Work Operations included in the above items include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) preparation of the surface prior to spraying
- c) supply of binder
- d) loading materials into the sprayer
- e) incorporating, mixing and heating materials, as necessary
- f) spraying
- g) unloading materials from the sprayer, if necessary, and
- h) cleaning roadside items, if necessary.

**Item 5107P** Supply and addition of adhesion agent (Provisional Quantity)

**Item 5108P** Supply and addition of cutter oil (Provisional Quantity)

Work Operations included in the above items include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) supply, addition and mixing of cutter oil or adhesion agent, where stated.

**Item 5111** Spreading prime cover material [*material*], [*spread rate*], [*location*]

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) loading, hauling, spreading, rolling and brooming of material, and
- c) removal and disposal of excess material.

**Item 5112** Spreading cover aggregate [*size*], [*spread rate*], [*location*]

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*

- b) loading, hauling, spreading, rolling and brooming of material, and
- c) removal and disposal of excess material.

**Item 5121 Supply of bituminous material [*material*], [*class | grade*]**

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 material
- c) storage and transport of material, and
- d) removal of excess material from the Site.

**Item 5131 Transport of bituminous material supplied by the Principal [*material*], from [*supply location*]**

**Item 5132 Transport of aggregate supplied by the Principal [*material*], from [*supply location*]**

Work Operations incorporated in the above items include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) transport of material from the point of supply to the Site as set out in the Principal Supplied Material List (Form C6827), and
- c) storage of material.

**Item 5141 Sprayed bituminous surfacing, [*including | excluding*] supply of binder, [*including | excluding*] supply of additives, [*including | excluding*] supply of cover aggregates, [*location*], refer to Clause 2 of Annexure MRTS11.1**

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 material, including binder, additives, prime cover material and cover aggregates, other than that supplied by the Principal as stated on Form C6827
- c) transport and storage of material
- d) preparation prior to spraying
- e) loading the relevant materials into the sprayer
- f) incorporating, mixing and heating materials, as relevant
- g) spraying
- h) unloading materials from the sprayer, if necessary
- i) cleaning roadside items, if necessary
- j) loading, hauling, spreading of prime cover material and cover aggregate
- k) rolling and brooming of cover aggregate
- l) removal and disposal of excess prime cover material and cover aggregate, and
- m) removal of excess material from the Site.

## **2.3 Methods of quantifying sprayed bituminous surfacing**

### **2.3.1 General**

Two methods are used for quantifying the work associated with sprayed bituminous surfacing. They are:

- a) by measuring the quantities of materials used in the surfacing operation, and
- b) by measuring the required area of surfacing.

### **2.3.2 Quantifying by materials used**

This method provides for the separate measurement of a spraying operation and a spreading operation.

The spraying operation shall be measured by Work Items 5101 (prime), 5102 (primerseal), 5103 (seal), 5104 (reseal), 5105 (enrichment) and 5106 (SAMI) which can either include or exclude the supply of binder. The following shall apply to quantifying the spraying operation:

- a) where the supply of binder is included, the Work Item shall be deemed to include all binder materials. Where the supply of additives are included, the Work Item shall be deemed to include all necessary cutter oil, flux oil and/or adhesion agent, and
- b) where the supply of binder and/or additives are excluded, bituminous material can be supplied by either the Principal or the Contractor. Material to be supplied by the Principal will be as listed on the Principal Supplied Material List (Form C6827). Any material not listed on the Principal Supplied Material List shall be supplied by the Contractor. Additional Work Items shall apply as follows
  - i. where bituminous materials are to be supplied by the Contractor, Work Item 5121 shall be provided for each type of bituminous material so supplied, and
  - ii. where bituminous materials are to be supplied by the Principal, Work Item 5131 shall be provided for transport from the point of supply of each type of bituminous material so supplied.

The spreading operation shall be measured by Work Items 5111 (prime cover material) and 5112 (cover aggregate) which are for spreading of material only. Materials can be supplied by either the Principal or the Contractor. Material to be supplied by the Principal will be as listed on the Principal Supplied Material List (Form C6827). Any material not listed on the Principal Supplied Material List shall be supplied by the Contractor.

Where aggregate materials are to be supplied by the Contractor, the Work Items included in MRS22 *Supply of Cover Aggregates* shall apply.

Where aggregate materials are to be supplied by the Principal, Work Item 5132 shall be provided for transport from the point of supply of each type of aggregate material so supplied.

### **2.3.3 Quantifying by area**

This method provides for the measurement of the complete surfacing operation by the area of surface required to be covered. This method is to be used only for small areas that are difficult to quantify by the method in Clause 2.3.2 above, including, for example, turnouts and gore areas.

Work Item 5141 shall be used and shall include the supply and installation of all materials in accordance with this Specification (including binder, additives, prime cover material and cover aggregates).

The details of the surfacing treatment represented by Work Item 5141 shall be as stated in Clause 2 of Annexure MRTS11.1.

Where material is to be supplied by the Principal, it will be listed on the Principal Supplied Material List (Form C6827) and Work Items 5131 or 5132 will be provided for transport from the point of supply of each type of material so supplied. Any material not listed on the Principal Supplied Material List shall be supplied by the Contractor.

## 2.4 Calculation of quantities

### 2.4.1 Binders, cutter oil and adhesion agent

The quantities of prime, primerseal, seal, reseal and SAMI seal at 15°C shall be determined from the tally of actual quantities of bituminous material sprayed on each spray run as recorded on the spray sheet, or the adjusted design spray rate + 5% whichever is the lesser. For a spray run of less than 500 litres, the quantity shall be calculated from the Designed Spray Rate.

The quantities of cutter oil and/or adhesion agent, recorded in litres, shall be determined from the tally of actual quantities incorporated into the binder used on the Works as recorded on the spray sheet.

Table 2.4.1 details where additional cutter oil and/or adhesion agent, if used, shall be quantified for payment.

**Table 2.4.1 – Quantification of cutter oil and adhesion agent for payment**

Binder/Application	Quantification for Payment (yes/no)		
	Cutter Oil	Adhesion Agent	Comments
Prime	No	No – not used	Cutter oil incorporated into the binder – no additional payment
Primerseal	No	Yes	Cutter oil incorporated into the binder – no additional payment
Seal and Reseal	Yes	Yes	
SAMI	Yes – Annexure provision	Yes	
Enrichment	No – not used	No – not used	

### 2.4.2 Spreading prime cover material and cover aggregate

The quantity of prime cover material and/or cover aggregate spread shall be determined from the tally of quantities of material used on each spray run as recorded on the spray sheet, or the adjusted design spread rate + 10% whichever is the lesser. In order to confirm these quantities, the Superintendent may order a stocktake of quantities from the Contractor's delivery dockets and any balance remaining in stockpiles. For a spray run with a quantity of less than 1 m<sup>3</sup> of aggregate, the quantity shall be calculated from the Designed Spread Rate.



### **2.4.3 Supply of bituminous material**

The quantities of bitumen, cutback bitumen that is cut back at the refinery, and/or polymer modified binder, where Work Items for these materials are included in the Schedule of Rates, shall be determined, at 15°C, from the tally of actual quantities of bituminous material sprayed on each spray run. For a spray run with a quantity of less than 500 litres of bituminous material, the quantity may be calculated from the Designed Spray Rate. The quantity shall not include any additional cutter oil, flux oil and/or adhesion agent added on Site or just prior to use in accordance with Clause 12.7 of MRTS11.

The quantities of cutter oil, flux oil and/or adhesion agent, where Work Items for such materials are included in the Schedule of Rates, shall be determined, at 15°C, from the quantity to be used for the specific site conditions at the time of spraying.

### **2.4.4 Transport of material supplied by the principal**

The quantity for transport of bituminous material supplied by the Principal will be the actual quantity of bituminous material, at 15°C, released to the Contractor at the point of supply.

The quantity for transport of prime cover material and/or cover aggregates supplied by the Principal will be the actual quantity released to the Contractor at the point of supply.

### **2.4.5 Sprayed bituminous surfacing by area**

The quantity of sprayed bituminous surfacing when specified by area shall be measured from the actual areas sprayed in accordance with the Contract.

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

### **3.1 Maximum reductions in standards**

A lot which has an Actual Spray Rate outside plus or minus 10% of the Adjusted Designed Spray Rate shall not be accepted for a reduced level of service.

A lot which has an amount of cover aggregate spread outside - 20% or + 20% of the Adjusted Designed Spread Rate shall not be accepted for a reduced level of service.

The maximum reduction in properties for bitumen shall be as specified in MRTS17 *Bitumen*.

### **3.2 Determination of the reduced value**

#### **3.2.1 General**

The reduced value for binder shall be as specified in Clauses 3.2.2 or 3.2.3 as applicable.

#### **3.2.2 Bitumen**

The percentage reduction in value for defects of bitumen delivered to site shall be equal to the number of defects determined from Clause 10.3 of MRTS17 *Bitumen* and Clause 7.1 of MRTS11 *Sprayed Bituminous Surfacing (Excluding Emulsion)*. This percentage reduction shall be applied to the rate for prime, primerseal, seal, reseal or enrichment as applicable.

#### **3.2.3 Polymer modified binder**

The percentage reduction in value for defects of polymer modified binder delivered to site shall be determined as specified in Clause 11 of MRTS18 *Polymer Modified Binder* and Clause 7.1 of MRTS11 *Sprayed Bituminous Surfacing (Excluding Emulsion)*.

### 3.2.4 Application

The percentage reduction in value shall apply only to the schedule rate for prime, seal, reseal or spreading cover aggregate, as applicable.

The percentage reduction in value shall be as stated in Table 3.2.4-A and Table 3.2.4-B. The percentage differences in spray rates and spread rates shall be rounded to the nearest whole number.

**Table 3.2.4-A – Reduction in value, actual spray rate**

% Difference from Adjusted Designed Spray Rate	% Reduction in Value
plus or minus 6	4
plus or minus 7	8
plus or minus 8	12
plus or minus 9	16
plus or minus 10	20

**Table 3.2.4-B – Reduction in value, actual cover aggregate spread rate**

% Difference from Adjusted Designed Spread Rate		% Reduction in Value for Range
Lighter Spread	Heavier Spread	
- 11 to - 13	+ 11 to + 13	5
- 14 to - 17	+ 14 to + 17	10
- 18 to - 20	+ 18 to + 20	15

### 3.2.5 Multiple reductions

Where more than one reduction applies, the percentage reductions shall be added.

## 4 Principal's materials

### 4.1 Return of excess principal's materials and/or containers

Those Principal's materials and/or containers listed as returnable in the Principal Supplied Material List, (Form C6827), and which are not used in the Works shall be returned to the Principal at the point of return given in the Principal Supplied Material List.

Payment for the return of excess materials and/or containers shall be at the rate for Work Item 5131, or if not appropriate, then as agreed to by the Superintendent and the Contractor. If an agreement cannot be reached, the Superintendent will determine a rate based on quotations from a third party for work of a similar nature.

### 4.2 Takeover of excess principal's bituminous materials (excluding modified bitumen)

Those Principal's bituminous materials, excluding modified bitumen, listed in Principal Supplied Material List (Form C6827), as materials to be taken over by the Contractor and which are not used in the Works shall be taken over by the Contractor. This clause does not include cutter oil, flux oil, adhesion agent, prime cover material or cover aggregate.

The takeover value shall be calculated from the quantity of excess material and the purchase unit rate paid by the Principal. The purchase price shall not include any transport and overhead charges.

The takeover value of excess material shall be deducted from the payments made to the Contractor. The deductions shall not affect any other entitlements to the Contractor under this Contract, such as cost adjustment for rise and fall in material costs.

**4.3 Additional principal's materials used to rectify a rejected lot**

Where a lot, or section of a lot, has been rejected and the Contractor has to use additional Principal's materials to carry out additional work and/or replace part or all of the lot or section of a lot, the cost of the additional Principal's materials shall be deducted from the payment made to the Contractor.

Where a lot or part of a lot has been rejected but subsequently accepted, the cost of any Principal's materials used on that lot or part of a lot during the original operations and in excess of the limits given in this Specification shall be deducted from the payment made to the Contractor.

Neither of the above applies to a lot or part of a lot utilised for a reduced level of service.

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