

# ROAD SPECIFICATION

R55 ASPHALT PLACEMENT

Date JUNE 2011

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

Index	Page
<b>R55.1 GENERAL</b> .....	4
<i>R55.1.1 Scope</i> .....	4
<i>R55.1.2 Objectives</i> .....	4
<i>R55.1.3 Obligations and Responsibilities</i> .....	4
<i>R55.1.4 Organization of Specification</i> .....	4
<i>R55.1.5 Traffic Categories</i> .....	5
<i>R55.1.6 Client Supplied Information</i> .....	5
<i>R55.1.7 References</i> .....	5
<i>R55.1.8 Contract Management Plan</i> .....	6
<b>R55.2 MATERIALS</b> .....	6
<i>R55.2.1 General</i> .....	6
<i>R55.2.2 Aggregates and Filler</i> .....	6
<i>R55.2.3 Binder</i> .....	6
<i>R55.2.4 Reclaimed Asphalt Pavement</i> .....	7
<b>R55.3 JOB MIX DESIGN</b> .....	7
<i>R55.3.1 General</i> .....	7
<i>R55.3.2 Statement of Compliance of Job Mix</i> .....	7
<b>R55.4 DELIVERY AND PLACEMENT</b> .....	7
<i>R55.4.1 General</i> .....	7
<i>R55.4.2 Delivery</i> .....	7
<i>R55.4.3 Surface Preparation</i> .....	7
<i>R55.4.4 Production and Construction Trial</i> .....	9
<i>R55.4.5 Bridge Deck Joints</i> .....	9
<b>R55.5 IN PLACE PROPERTIES</b> .....	10
<i>R55.5.1 General</i> .....	10
<i>R55.5.2 Levels</i> .....	10
<i>R55.5.3 Alignment</i> .....	10
<i>R55.5.4 Thickness</i> .....	10
<i>R55.5.5 Density and In-situ Air Voids</i> .....	10
<i>R55.5.6 Surface Shape</i> .....	11
<i>R55.5.7 Roughness Measurement</i> .....	11
<i>R55.5.8 Payment Adjustment based on Assigned Roughness</i> .....	11
<i>R55.5.9 Unacceptable Level of Service</i> .....	12
<b>R55.6 QUALITY CONTROL AND EVIDENCE OF COMPLIANCE</b> .....	12
<i>R55.6.1 General</i> .....	12
<i>R55.6.7 In place Properties</i> .....	12
<i>R55.6.8 Completed Works Report</i> .....	12
<b>R55.7 MEASUREMENT AND PAYMENT</b> .....	13
<i>R55.7.1 General</i> .....	13
<i>R55.7.2 Measurement by Mass</i> .....	13
<i>R55.7.3 Payment Adjustment for Bitumen Price Variation</i> .....	14
<b>R55.8 NON- COMPLYING MATERIALS</b> .....	14
<b>R55.9 HOLD POINTS AND DELIVERABLES</b> .....	14
<b>APPENDIX R55.A1 DENSE GRADED MIXES</b> .....	16
<b>TARGET VALUES AND ACCEPTANCE CRITERIA</b> .....	16
<i>R55.A1.1 SCOPE</i> .....	16
<i>R55.A1.2 TARGET AGGREGATE GRADING AND BINDER CONTENT</i> .....	16
<i>R55.A1.3 MIX PROPERTIES</i> .....	17
<i>R55.A1.4 ASPHALT MIXES INCORPORATING RECLAIMED ASPHALT PAVEMENT</i> .....	18
<i>R55.A1.4.1 General</i> .....	18
<i>R55.A1.4.2 Asphalt mixes containing more than 15% but less than 30% of RAP</i> .....	18
<i>R55.A1.4.3 Asphalt mixes containing more than 30% of RAP</i> .....	18
<i>R55.A1.5 IN-SITU AIR VOIDS</i> .....	18
<b>APPENDIX R55.A2 STONE MASTIC ASPHALT (SMA)</b> .....	20

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

<b>TARGET VALUES and ACCEPTANCE CRITERIA</b> .....	20
<i>R55.A2.1 SCOPE</i> .....	20
<i>R55.A2.2 AGGREGATE GRADING AND BINDER CONTENT</i> .....	20
<i>R55.A2.3 MIX DESIGN</i> .....	20
<i>R55.A2.4 IN-SITU AIR VOIDS</i> .....	20
<b>APPENDIX R55.A3 OPEN GRADED MIXES</b> .....	21
<b>TARGET VALUES AND ACCEPTANCE CRITERIA</b> .....	21
<i>R55.A3.1 SCOPE</i> .....	21
<i>R55.A3.2 AGGREGATE GRADING AND BINDER CONTENT</i> .....	21
<i>R55.A3.3 MIX DESIGN</i> .....	21
<b>APPENDIX R55.A4 FINE GAP GRADED ASPHALT (FGGA)</b> .....	22
<b>TARGET VALUES AND ACCEPTANCE CRITERIA</b> .....	22
<i>R55.A4.1 SCOPE</i> .....	22
<i>R55.A4.2 TARGET AGGREGATE GRADING AND BINDER CONTENT</i> .....	22
<i>R55.A4.3 MIX DESIGN</i> .....	22
<i>R55.A4.4 IN-SITU AIR VOIDS</i> .....	22
<b>APPENDIX R55.A5</b> .....	23
<b>ASPHALT FOR PATCHING REPAIRS TO SEALED PAVEMENTS</b> .....	23
<i>R55.A5.1 SCOPE</i> .....	23
<i>R55.A5.2 MATERIALS</i> .....	23
<i>R55.A5.3 CONTRACT MANAGEMENT PLAN</i> .....	23
<i>R55.A5.4 REQUIREMENTS</i> .....	23
<i>R55.A5.5 COMPLIANCE</i> .....	23
<b>APPENDIX R55.B DETERMINATION OF IN-SITU AIR VOIDS</b> .....	25
<i>R55.B.1 SCOPE</i> .....	25
<i>R55.B.2 IN-SITU DENSITY</i> .....	25
<i>R55.B.3 REFERENCE DENSITY</i> .....	25
<i>R55.B.4 CHARACTERISTIC RELATIVE COMPACTION</i> .....	25
<i>R55.B.5 CHARACTERISTIC IN-SITU AIR VOIDS</i> .....	25
<b>APPENDIX R55.C MILLING OF ASPHALT</b> .....	26
<i>R55.C.1 SCOPE</i> .....	26
<i>R55.C.2 CONTRACT MANAGEMENT PLAN</i> .....	26
<i>R55.C.3 TRAFFIC MANAGEMENT PLAN</i> .....	26
<i>R55.C.3 PLANT</i> .....	26
<i>R55.C.4 STANDARDS OF WORK</i> .....	27
<i>R55.C.4.1 General</i> .....	27
<i>R55.C.4.2 Test Strip</i> .....	27
<i>R55.C.4.3 Milled Surface Tolerances</i> .....	27
<i>R55.C.4.4 Evidence of Compliance</i> .....	27
<i>R55.C.5 ASPHALT REPLACEMENT</i> .....	27
<i>R55.C.6 TEMPORARY RAMPING</i> .....	27
<i>R55.C.7 HOLD POINTS</i> .....	28
<b>APPENDIX R55.D JOB MIX COMPLIANCE AND CONTROL LIMITS</b> .....	29
<b>Statement:</b> .....	30

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

## **R55.1 GENERAL**

### **R55.1.1 Scope**

This specification sets out the requirements for the supply and placement of dense graded, stone mastic, open graded and fine gap graded asphalts produced in accordance with *Standard Specification G7 Production of Asphalt*. It includes:

- objectives, obligations, references and standards for testing
- material quality requirements
- quality control and evidence of compliance
- in place properties.
- measurement and payment

### **R55.1.2 Objectives**

The objectives of this specification are to:

- obtain a durable asphalt of consistent properties, appropriate to its intended usage
- ensure that that the component materials and manufactured asphalt are of the specified quality
- ensure that all information necessary to effectively manage the production and placement of the asphalt is documented in a manner that facilitates the inquisition of that information by both the Contractor and Superintendent.

### **R55.1.3 Obligations and Responsibilities**

The Contractor is responsible for the quality of all asphalt supplied under the project.

The Contractor must ensure that the Producer has a quality plan that satisfies the requirements of G7 and is working to that plan, that testing is being undertaken and recorded in accordance with G7 and that incoming products and the manufactured asphalt complies with all the requirements of G7 and this specification.

### **R55.1.4 Organisation of Specification**

The body of the specification sets out the required general standards for design, manufacture, placement, in place properties, quality control and evidence of compliance common to all asphalt types.

The appendices set out the specific technical criteria of materials and particular product types.

Appendix R55A sets out the target values and acceptance criteria for the various grades of asphalt.

- Appendix R55A1 – Dense Graded Asphalt (AC)
- Appendix R55A2 – Stone Mastic Asphalt (SMA)
- Appendix R55A3 – Open Graded Asphalt (OGA)
- Appendix R55A4 – Fine Gap Graded Asphalt (FGGA)

Appendix R55A5 sets out the requirements for asphalt for patching repairs to sealed pavements.

Appendix R55B sets out the methods of measurement and calculation of in-situ air voids.

Appendix R55C sets out the requirements for removal of asphalt by milling.

Appendix R55D, which is to be completed by the Contractor, sets out the acceptance limits of the asphalt for the proposed works

R55EN Explanatory Notes provide background information and details the information that should be provided in the project specification.

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

**R55.1.5 Traffic Categories**

The required properties of asphalt and its components are based on the Traffic Categories defined in *Austrroads Guide to Pavement Technology, Part 4B Asphalt, Appendix A Mix Design Procedures*. The particular traffic category will be nominated in the project specification.

One of the following traffic categories will apply:

- light
- medium
- heavy
- very heavy

**R55.1.6 Client Supplied Information**

The project specification will include the following information:

- AADT and commercial vehicle information
- site classification for traffic management.
- special events/considerations
- roughness of the existing pavement when payment adjustments are to apply in rehabilitation work
- asphalt type including nominal size and binder type(if not class 170)
- mix design requirements including traffic category, additional level 2 and/or level 3 tests
- surface shape if other than class 2 and roughness measurement limits if other than table R55.5.8
- production and construction trial
- any limits on the amount of RAP

**R55.1.7 References**

Asphalt placement shall be in accordance with all DIER Standards and Specifications, in particular:

- G1 – General Provision
- G2 – Contract Management Plan
- G3 – Traffic Management
- G6 – Production of Aggregates and Rock Products
- R40 - Pavement Base and Sub base

and the *Austrroads Guide to Pavement Technology* and Australian Standards:

*Austrroads Guide to Pavement Technology*:

- AP-C87/08 Glossary of Austrroads Terms;
- Part 3 Pavement Surfacing;
- Part 4B Asphalt;
- Part 4E Recycled Materials;
- Part 4F Bituminous Binders;
- Part 4G Geotextiles and Geogrids;
- Part 4H: Test Methods;
- Part 4K Seals;
- Part 8 Pavement Construction;

There are a number of Austrroads reports referenced in these guides that are also to be used particularly:

- AG:PT/T190 Specification Framework for Polymer Modified Binders and Multigrade Bitumens;
- AP-T42/06 Guide to the selection and use of Polymer Modified Binders and Multigrade Bitumens.

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

*Standards Australia:*

- AS1141 – Methods for Sampling and Testing Aggregates
- AS1289 – Methods of Testing Soils for Engineering Purposes
- AS2150 – Hot Mix Asphalt- A guide to good practice
- AS2891 – Methods of Sampling and Testing Asphalt
- AS4283 – Cold Mix Asphalt for Maintenance Patching

**R55.1.8 Contract Management Plan**

The Contractor's Contract Management Plan shall include the following:

The method of oversight of the quality of the incoming asphalt including:

- supply and control of incoming
- matching supply to location on the pavement
- inspection and test regimes of truck loads and delivery documents
- presentation and analysis of data, including control charts for grading, binder content and maximum density
- placement of asphalt including:
  - ambient conditions necessary for placement to proceed
  - preparation of surface, including repair of defects
  - protection of services and road furniture, etc.
  - tack coating and priming
  - spreading
  - compaction
  - treatment of joints
  - thickness and level control
  - sampling and test procedures for thickness, shape, ride quality and insitu air voids
  - clean up of surface, services, road furniture etc.
  - covering and repair of core holes
  - conduct of production and construction trial
  - bridge decks
  - control and remedial treatment for a not complying product,
  - specific requirements listed in Appendices R55A1 to A5 and R55B.

The procedures, resources allocated and standards of work shall be consistent with good practice for the particular mix type and shall be not less than those set out in AS2150.

**R55.2 MATERIALS**

**R55.2.1 General**

All materials used in the production of asphalt shall have consistent properties and shall satisfy the requirements of this specification and *Standard Specification G7 Asphalt Production*.

Each individual component of the supplied mix shall be obtained from the same source as the materials used to establish the Job Mix.

**R55.2.2 Aggregates and Filler**

All rock products, including crusher dust, shall be obtained from sources complying with *Standard Specification G6 Production of Aggregates and Rock Products*.

**R55.2.3 Binder**

Unless otherwise specified in the project specification, the binder shall be Class 170 bitumen. The requirements for binders, including PMBs, additives and rejuvenating agents are defined in *Standard Specification G7 Asphalt Production*.

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

**R55.2.4 Reclaimed Asphalt Pavement**

The requirements for RAP for use in dense graded mixes are defined in *Standard Specification G7 Asphalt Production*.

Restrictions apply as to where asphalt that contains RAP can be used and to the proportion of RAP that is acceptable in a job mix (Appendix R55.A1).

**R55.3 JOB MIX DESIGN**

**R55.3.1 General**

The mix design procedures and reporting requirements are defined in *Standard Specification G7 Asphalt Production*. **A mix design shall be invalid after two (2) years or if there are changes to any of the components.**

The Contractor shall provide the Job Mix Design report as well as the samples defined in *Table R55.3.1 Sample Quantities of Constituent Materials* with the statement of compliance Appendix R55D.

**Table R55.3.1 – Sample Quantities of Constituent Materials**

<b>Material</b>	<b>Sample Quantity</b>
Each coarse and fine aggregate component	50kg
RAP (if used)	50kg
Added Mineral Filler	5kg
Binder	8 litres
Additives	As appropriate

**R55.3.2 Statement of Compliance of Job Mix**

The Contractor shall submit to the Superintendent a completed and signed Appendix R55D at least ten (10) days prior to the intended date for the commencement of production together with, if required by the Superintendent, a copy of the Job Mix Design Report. Acceptance of the design constitutes a Hold Point.

**R55.4 DELIVERY AND PLACEMENT**

**R55.4.1 General**

The Contractor's procedures for delivery and placement of asphalt shall ensure that;

- the asphalt does not deteriorate during transport.
- all asphalt temperature, site temperature and other ambient conditions necessary for the successful placing of asphalt are met.
- it is possible to establish the particular production control test results for the asphalt placed in each compaction lot.

**R55.4.2 Delivery**

Each loaded truck shall be visually inspected for segregation, uncoated particles, excess bitumen or overheating, before dispatch from the plant. A delivery docket shall be provided with each truck load. The delivery docket shall include all the information required in G7.4.6 and as well include:

- time and location of discharge
- temperature of asphalt at time of discharge

**R55.4.3 Surface Preparation**

Prior to the placing of asphalt, the surface shall be prepared.

The Contractor shall provide notice to the Superintendent at least two (2) days prior to the desired date for a **joint** inspection of the existing surface. The surface to be inspected shall be

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

free of all adhered foreign material, loose stones, existing thermoplastic markings and raised pavement markers.

During the inspection, the Superintendent **in the company of the Contractor**, shall:

- mark out the location of defects in the existing surface that require treatment.
- define the nature and extent of the required surface treatment.
- define the **additional site specific** information that the Contractor must provide **as evidence of compliance at the Hold Point release**.

***Pavement Repairs***

Pavement repairs to any surface, both existing bituminous or new pavement, shall include:

- repair of surface defects
- removal of adhered foreign matter, loose stones, existing thermoplastic markings and raised pavement markers

**Surface preparation treatment shall extend at least 200mm beyond the outside (shoulder) edges of the proposed adjacent surfacing treatment.**

A Hold Point shall be designated at the time the Contractor notifies the Superintendent of the completion of the surface preparation and provides the required information.

***Existing Bituminous Surfacing***

Where the works involve the placing of asphalt on a bituminous surface that was not produced under the current Contract, any reconstruction patches and/or pothole repair exceeding 30mm in depth, as identified by the Superintendent for treatment **during the joint inspection**, shall be paid as a separate item.

If required by the Superintendent, the Contractor shall provide details of the depth and location of reconstruction patches and details of the nature and quality of the repair materials.

***Tack Coat***

A tack coat shall be applied to existing bituminous surfaces prior to the placing of asphalt unless the Superintendent directs otherwise. The residual binder content of the tack coat shall not be less than 0.15 l/m<sup>2</sup>.

***New Granular Pavement Surfaces***

All new **granular** pavement surfaces shall have an emulsion primerseal applied prior to the placement of any asphalt **where the placement of the asphalt is to be within three (3) months**.

***Substrate Produced Under the Current Contract***

The substrate shall be prepared in accordance with the relevant DIER Standard Specification. The composition of, and / or time of placing of primes, primerseals and seals within the substrate shall be such that volatiles within the substrate will not reduce the future performance of the asphalt.

The required inspection shall be made after the completion of the specified prime, primerseal or seal. All required repairs to the substrate shall be made at the Contractor's expense. The Superintendent may direct that a tack coat be applied prior to the placement of the asphalt.

***Removal of Thermoplastic Pavement Markings***

**All existing Thermoplastic Pavement Markings shall be removed flush with the surrounding surface prior to asphalt placement unless otherwise approved by the Superintendent.**

**Details of the method for removing existing markings shall be included in the Contract Management Plan (CMP).**

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

A small trial section of line marking removal shall be undertaken and inspected by the Superintendent in order to establish an acceptable standard of surface texture to be achieved on completion of line removal.

Any surface defects created by the removal of Pavement Markings shall be repaired by the Contractor at no additional cost to the Principal prior to asphalt placement.

***Raised Road Pavement Markers (RRPMs)***

All existing RRPMs shall be removed prior to asphalt placement and any surface defects created by the removal of the RRPMs shall be corrected prior to asphalt placement.

***Surface Preparation Hold Points***

Surface Preparation Hold Points shall be:

- joint inspections of the existing surface
- method of removal of existing markings after the trial
- completion of the surface preparation including removal of existing thermoplastic markings.

Evidence of compliance including all supporting information shall be provided to the Superintendent prior to the release of each Hold Point.

***R55.4.4 Production and Construction Trial***

The Project Specification will identify if a production and construction trial is required. The size, layout and conduct of the trial shall be in accordance with the Austroads "Framework for Specifying Asphalt".

In the event that a trial is required, it shall be undertaken and tested in accordance with this specification for asphalt composition and in-place properties. The trial shall be undertaken at a site agreeable to the Superintendent at least five (5) days prior to the intended date of production and in the presence of the Superintendent.

The Contractor shall provide a report of the trial. The report shall include:

- a description of the asphalt, including the grading, binder content and reference density.
- achieved air voids.
- layer thickness.
- a description of the plant used to place and compact the asphalt.

In the event that the tests indicate that the asphalt in the test section does not conform to the specification requirements, the Contractor shall make any necessary adjustments and, if necessary, repeat the trial until the Superintendent is satisfied that asphalt of uniform quality is being consistently produced, placed, compacted and finished in accordance with the requirements of this specification.

The Contractor may use the trial to establish the density offset, as defined in AS2891.14. In the event that the compacted asphalt layer thickness is less than 50mm but not less than 35mm and that no thin layer asphalt gauge is available, the Superintendent may permit the use of a conventional nuclear meter operating in the backscatter mode. The Contractor shall provide evidence, based on the trial results, that the use of the conventional gauge is satisfactory.

Submission of the report represents a Hold Point.

***R55.4.5 Bridge Deck Joints***

When placing asphalt over bridge decks, the Contractor shall construct joints in the asphalt as shown on the drawings and ensure such joints are coincident with the deck joints.

## **R55.5 IN PLACE PROPERTIES**

### **R55.5.1 General**

For the purpose of compliance testing of asphalt for air voids and thickness, a pavement lot shall be an essentially homogeneous section of completed pavement, not greater than 500 tonnes or a shift production, whichever is the lesser.

Provision of evidence showing compliance with R55.5.2, R55.5.3, R55.5.4 and R55.5.5 represents a Hold Point.

### **R55.5.2 Levels**

The level at the top and bottom of each course of asphalt shall not differ from the specified level by more than +/- 5mm. Where asphalt is placed against kerb and channel, the surface at the edge of the wearing course shall be flush with, or not more than 5mm above, the lip of the channel, unless otherwise specified or shown on the Drawings.

### **R55.5.3 Alignment**

The horizontal location of any point on the pavement shall not vary by more than +50mm from the corresponding point shown in the documents. When alignment with an existing pavement or structure is necessary the new work shall be joined such as to produce a smooth transition from the new to the pre-existing.

### **R55.5.4 Thickness of Layers**

Asphalt shall be spread in layers to the compacted thickness as specified or shown on the drawings. Generally the minimum thickness of a layer shall be three (3) times the nominal size of the mix.

Verification of layer or course thickness, if required by the Superintendent, shall be undertaken on a lot basis by at least five (5) cores in a random sampling plan.

For asphalt placed on new work the average thickness of any individual course within a lot shall not differ from the specified thickness by more than 10% of the characteristic thickness, calculated as  $\bar{x} - s$ , shall not be less than 75% of the specified thickness.

Where:

- $\bar{x}$  is the mean of the thickness measurements
- $s$  is the sample standard deviation of the thickness measurements

### **R55.5.5 Density and In-situ Air Voids**

Where specified in Appendix R55A1 to A4, the work represented by a lot shall be assessed for characteristic in-situ air voids as defined in Appendix R55B. The characteristic in-situ air voids shall not exceed the maximum value specified in Appendix A1 to A4.

The estimation of in-situ air voids will not be required where:

- the lot size is less than 30t
- the nominal layer thickness is less than 30mm
- the nominal layer thickness is less than 2.5 times the nominal mix size

When the Contractor can demonstrate that the placement and compaction processes are under control and are adequate to provide the specified air voids the Superintendent may agree that all lots may not need to be tested for air voids and nominate the lots to be tested.

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

**R55.5.6 Surface Shape**

Surface Shape Class 2 will apply unless otherwise specified in the Project Specification. No point on the finished surface shall deviate below a 3m straightedge, measured between any two points, by more than the tolerances specified in *Table R55.5.6 Permissible tolerances in surface shape*.

**Table R55.5.6-Permissible tolerances in surface shape**

Layer	Deviations below 3m straightedge, mm					
	Class1		Class2		Class3	
	Parallel to centreline	Transverse to centreline	Parallel to centreline	Transverse to centreline	Parallel to centreline	Transverse to centreline
Wearing courses	3	5	5	7	7	10
Lower courses	6	10	8	12	12	16

**R55.5.7 Roughness Measurement**

Where the works include the placement of asphalt across a full lane width, the Contractor shall undertake a roughness survey prior to Practical Completion. Payment adjustments based on an assigned roughness may apply. Measurements and the calculation of the assigned roughness shall be determined in accordance with this clause and R40 Appendix B2.

All areas of roadway, carriageway and ramps shall be tested, except for those areas of the works which are less than 200m continuous length. Individual carriageways, ramps, side roads and different surfacing types shall be treated as individual lots. Roundabouts and bridge decks including expansion joints shall not be included in the calculation of assigned roughness.

**R55.5.8 Payment Adjustment based on Assigned Roughness**

The payment adjustment shall be based on the assigned roughness determined for each carriageway. The adjustment applies to the tendered price for the supply and placement of asphalt within the particular carriageway. The adjustment may be positive or negative.

The payment adjustment for new construction is included in *Table R55.5.8 Payment Adjustments for Asphalt Surfacing on New Pavement Construction*. New construction for the purpose of this clause involves the construction of a full carriageway to a depth equal to or exceeding 200mm. A payment adjustment provision for asphalt roughness for other than new construction may be included in the Project Specification.

**Table R55.5.8 Payment Adjustments for Asphalt Surfacing on New Pavement Construction**

Assigned Roughness Lane IRI <sub>qc</sub>	Percentage Adjustment to Payment (%)
0 to 1.40	Additional 1.0% for each 0.10 or part thereof that R <sub>c</sub> < 1.40
>1.41 ≤ 1.60	No adjustment
>1.61 ≤ 2.00	Reduction of 1.0% for each 0.10 or part thereof that R <sub>c</sub> > 1.60
Greater than 2.01	Unacceptable Level of Service

In the event that the starting and finishing points of the roughness survey do not include the joints between the new work and adjacent sections, or that the Contractor deletes the readings covering these joints from the calculation of the characteristic roughness, the Contractor shall:

- inform the superintendent of the reasons for excluding the joints.

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

- eliminate unevenness at the joints and unevenness within the 100m measurement interval that includes these particular joints to the satisfaction of the Superintendent.

**R55.5.9 Unacceptable Level of Service**

Where the completed surface is unacceptable, the Contractor shall provide to the Superintendent a proposal to return the works to an acceptable level. The Contractor shall not proceed with the proposed remedial works without the prior approval of the Superintendent. The Principal shall not be liable for any costs incurred by the Contractor in returning the works to an acceptable level of service.

**R55.6 QUALITY CONTROL AND EVIDENCE OF COMPLIANCE**

**R55.6.1 General**

The Contractor shall ensure that:

- the asphalt has been designed in accordance with the requirements of the Project Specification.
- the asphalt has been produced under controlled conditions, using products of known quality and variability.
- the asphalt has been produced, stored and handled in a manner that is not detrimental to its performance in place.
- production control testing of the product has been undertaken in accordance with the frequencies defined in G7.
- quality control charts are produced and are readily available for inspection by the Contractor and Superintendent.
- the specified in place properties of the asphalt have been achieved.
- there is documentation readily available to the Contractor and Superintendent that demonstrates that the above requirements are being met.

The Contractor shall:

- maintain records covering the compliance through all the stages from design to the completion of placement.
- if required provide a design report and samples of constituent materials.
- inspect all loads of the asphalt delivered to the project for uniformity and temperature.
- test for the specified in place properties.
- provide a completion report.

**R55.6.7 In place Properties**

The Contractor shall record the sequence of work and the start and finish locations of each day's work. The locations shall be shown on a site layout plan.

The Contractor shall maintain an inspection regime covering, levels, alignment, layer thickness and surface shape, in-situ air voids and roughness.

**R55.6.8 Completed Works Report**

In addition to the requirements of Standard Specification G1 the Completed Works Report shall contain:

- completed Appendix R55D
- control charts as defined in G7.4.5
- details of any non-conformance in component materials, asphalt properties, temperature and in place properties
- production and Construction Trial Report

Submission of the Completed Works Report represents a Hold Point.

## **R55.7 MEASUREMENT AND PAYMENT**

### **R55.7.1 General**

Separate items are included in the Schedule of Rates for each nominal course thickness and each nominal size and type of asphalt specified.

Payment for asphalt shall be:

- for new pavements, bridge decks and areas where the depth of asphalt is consistent - by square metres and
- for placement on existing bituminous surfacing where the depth of asphalt varies, including milled areas - by mass.

Payment shall be for the actual thickness.

A payment adjustment in accordance with this Specification or the Project Specification may apply.

For bituminous surfacing specific contracts, payment shall be withheld until the completed works report for the relevant sites has been provided.

Waterproofing seals and tack coats, removal of asphalt by milling and the cutting of chases shall be paid as separate items.

Reconstruction patches and the repair of potholes greater than 30mm in depth in existing bituminous surfaces and repairs not produced under the current Contract shall be paid as a separate item.

Measurement for payment will include all works shown on the plans or as specified but will not include asphalt that:

- includes raw materials (aggregates, binder, filler etc) that do not comply with the requirements of this specification.
- does not comply with the job acceptance limits for grading and / or binder content and / or in place properties.
- does not comply with the temperature or storage time requirements of the binder.
- has been lost in transit.
- is excess asphalt arising from out-of-tolerance levels and thickness.

Payment for testing shall be included in payment for asphalt except where Level 2 and Level 3 testing is included in the Project Specification. Level 2 and Level 3 tests and the Production and Construction Trial are included as separate items in the Schedule of Rates.

Payment for the Production and Construction Trial covers the cost of additional testing arising from the trial. It does not include the cost of supply of the asphalt.

Payment for bridge joints shall be on the basis of linear metres constructed.

### **R55.7.2 Measurement**

#### **Area**

In accordance with clause G1.18.3 Basis of Payment.

#### **Mass**

The quantity of asphalt shall be determined from delivery dockets supplied by the Contractor and issued at a certified weighing station unless measurement by batch weights using certified scales is approved by the Superintendent.

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

The area and thickness shall be determined from the dimensions on the plans or as specified for the work being measured. The density of a lot shall be taken as the arithmetic mean of the in-situ densities of the lot.

**R55.7.3 Payment Adjustment for Bitumen Price Variation**

This clause is to be used for contracts where the supply of asphalt is more than 3 months after the closing of tenders of the contract and the quantity of asphalt covered by the claim is greater than 400 tonnes.

If the Contractor or Superintendent makes claim for a payment adjustment arising from a variation in the price of bitumen arising after the date of closure of tenders, the claim shall relate to the increase or decrease in the bitumen supplier's Published List Selling Price (PLSP) at relevant storage depots. The claim shall be supported by evidence of the variation in bitumen price and of the quantity of bitumen covered by the claim.

The payment adjustment shall be calculated as:

Payment Adjustment = Price variation per tonne of bitumen x Mass (tonnes) of bitumen supplied in approved job mix and laid on site.

In the event that payment adjustments to the contract price are made arising from long term CPI movements, such payments shall be increased or decreased by the payment adjustment for bitumen price variation as determined above.

**R55.8 NON-COMPLYING MATERIALS**

In the event that the material supplied is not within the tolerances and standards defined for manufacture or placing of asphalt, the Superintendent may:

- direct the removal of non complying material; or
- offer a reduced payment for the non complying material; or
- accept another remedial treatment that is proposed by the Contractor.

**R55.9 HOLD POINTS AND DELIVERABLES**

The following Hold Points have been identified in this specification:

Ref	Description of Hold Point	Nominated Work not to proceed	Evidence of Compliance	Time for Release of Hold Point
R55.3	Provision of Mix Design and Samples	Production of asphalt	Mix Design and samples and Statement of Compliance of Job Mix	10 days
R55.4.3	Joint Inspection of Surface	Surface preparation	Documentation of defects and proposed repairs	2 days
R55.4.3	Removal of Thermoplastic Pavement Markings Trial	Removal of Thermoplastic Pavement Markings	Acceptance of removal method	2 days
R55.4.3	At completion of Surface Preparation	Placement of tack coat or waterproofing seal	Test results and documentation of surface preparation activities	2 days
R55.4.4	Completion of Production and Construction Trial	Placement of asphalt	Trial report	2 days

DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

R55.5.1	In Place Properties of a Lot	The next lot or application of pavement marking	Measurements of levels, alignment, thickness, density and in-situ air voids	1 day
R55.7	Completed Works Report (R55.6.8) & Progress Payment Claim	Progress Payment	Completed Works Report & Progress Payment Claim	28 days

**APPENDIX R55.A1 DENSE GRADED MIXES  
TARGET VALUES AND ACCEPTANCE CRITERIA**

**R55.A1.1 SCOPE**

This appendix sets out the requirements for Dense Graded Asphalt and contains:

- target aggregate grading and target binder contents.
- design criteria for both *Austroads Guide to Pavement Technology, Part 4B Asphalt, Appendix A Mix Design Procedures* and marshall mix design methods.
- requirements for the design of asphalts containing RAP.
- production tolerances to be applied to the target values.
- required characteristic values for air voids of in place asphalt.

**R55.A1.2 TARGET AGGREGATE GRADING AND BINDER CONTENT**

Unless otherwise specified, asphalt mixes shall be designed with a target grading and binder content complying with the limits given in *Table R55.A1.2.1 – Combined Aggregate Grading (Including Filler) for Medium, Heavy and Very Heavy Traffic Wearing Courses and All Base Course Mixes* for medium, heavy and very heavy traffic wearing courses and all base course mixes, or *Table R55.A1.2.2 Combined Aggregate Grading (Including Filler) for Light Traffic Wearing Course Mixes* for all light traffic wearing courses. Bitumen content shall be expressed as a percentage by mass of the total mix.

**Table R55.A1.2.1 – Combined Aggregate Grading (Including Filler) for Medium, Heavy and Very Heavy Traffic Wearing Courses and All Base Course Mixes**

Sieve Size AS (mm)	Mix Designation				
	AC10	AC14	AC20	AC28	AC40
	Percentage passing sieve size (by mass)				
					100
37.5				100	90-100
26.5			100	90-100	72-87
19.0		100	90-100	73-88	58-76
13.2	100	90-100	71-86	58-76	
9.5	90-100	72-83	58-75	47-67	38-58
6.7	68-82	54-71	46-64	37-58	
4.75	50-70	43-61	37-55	30-50	27-43
2.36	32-51	28-45	24-42	20-37	16-33
1.18	22-40	19-35	15-32	13-28	11-26
0.600	15-30	13-27	10-24	9-22	7-20
0.300	10-22	9-20	7-17	6-16	5-14
0.150	6-14	6-13	4-12	4-10	4-10
0.075	4-7	4-7	3-6	3-6	3-6
Binder Content (% by mass)	4.5-6.5	4.0-6.0	3.8-5.8Note 1	3.5-5.5	3.0-5.0

Note: 1. The range of binder content for high fatigue base course mixes shall be increased by 1 percentage point.

**Table R55.A1.2.2 – Combined Aggregate Grading (Including Filler) for Light Traffic Wearing Course Mixes.**

Sieve Size AS (mm)	Mix Designation		
	AC7	AC10	AC14
Percentage Passing Sieve Size (by mass)			
19.0			100
13.2		100	90-100
9.5	100	90-100	72-89
6.7	85-100	68-87	54-79
4.75	70-87	50-76	43-69
2.36	44-65	32-57	28-53
1.18	29-48	22-42	19-40
0.600	19-35	15-31	13-30
0.300	12-25	10-23	9-22
0.150	8-16	6-14	6-15
0.075	5-8	4-7	4-7
Binder Content (% by mass)	5.0-7.0	4.5-6.5	4.3-6.3

**R55.A1.3 MIX PROPERTIES**

Where laboratory preparation and compaction is undertaken using gyratory compaction (APRG Report 18 procedures), asphalt mixes shall comply with the target volumetric design criteria listed in Tables R55.A1.3.1 *Level 1 Design and Refusal Density Requirements for Asphalt Mixes Prepared Using Gyratory Compaction* and Voids Mineral Aggregate (VMA) requirements listed in Table R55.A1.3.3 *Voids Mineral Aggregate (VMA)*. Where laboratory preparation and compaction of asphalt mixes is undertaken using the Marshall method, asphalt mixes shall comply with the target design criteria listed in Tables R55.A1.3.2 *Design Requirements for Asphalt Mixes Compacted by the Marshall Method (50 Blow Compaction1)* and VMA requirements in Table R55.A1.3.3 *Voids Mineral Aggregate (VMA)*.

**Table R55.A1.3.1 – Level 1 Design and Refusal Density Requirements for Asphalt Mixes Prepared Using Gyratory Compaction**

Mix Type		Laboratory Compaction Level (cycles)	Design Air Voids – Target (%)	Air Voids at 250 cycles – min (%)
Traffic Category	Application			
Light	Wearing and base	50	4.0	-
Medium	Wearing and base	80	4.0	-
	High fatigue base	80	3.0	-
Heavy	Wearing and base	120	4.0	-
	High fatigue base	80	3.0	-
Very Heavy	Wearing and base	120	5.0	2.0

**Table R55.A1.3.2 – Design Requirements for Asphalt Mixes Compacted by the Marshall Method (50 Blow Compaction1)**

Mix Type		Design Air Voids (%)	Stability – min (kN)	Flow (mm)
Traffic Category	Application			
Light	Wearing and base	3.0	5.5	2-4
Medium	Wearing and base	4.0	6.5	2-4
	High fatigue base	3.0	6.5	2-4
Heavy	Wearing and base	5.0	6.5	2-4
	High fatigue base	3.0	6.5	2-4
Very Heavy	Wearing and base	6.0	7.0	2-4

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

*Note:*

*Where 75 blow Marshall compaction is used, the air voids targets shall be reduced by 1 percentage point.*

**Table R55.A1.3.3 – Voids Mineral Aggregate (VMA)**

Mix Nominal Size (mm)	VMA (%minimum)		
	Gyratory Compaction	Marshall Compaction (50 blow 1)	
		Heavy / Very Heavy Traffic Wearing Course Mixes	Other Mix Types
7	17	-	17
10	16	17	16
14	15	16	15
20	14	-	14
28	13	-	13
40	12	-	12

*Note:*

*Where 75-blow Marshall compaction is used, the VMA targets shall be reduced by 1 percentage point.*

All mixes shall be designed to have a minimum effective binder film thickness of 7.5 microns with the exception of high fatigue base that shall have a minimum effective design binder film thickness of 10 microns. The surface area shall be corrected for the combined bulk density of the mineral aggregate, unless the combined bulk density varies by less than 10% of 2.65 t/m<sup>3</sup> (refer APRG Report No 18, Equation 3.4).

**R55.A1.4 ASPHALT MIXES INCORPORATING RECLAIMED ASPHALT PAVEMENT**

**R55.A1.4.1 General**

Separate mix designs shall be prepared for all mixes containing RAP. Binder in RAP shall be included as binder in the total mix. Alterations to the proportion of RAP shall constitute a design change.

Unless otherwise specified, RAP in proportions up to 15% by mass of the total mix shall be permitted in all mixes.

**R55.A1.4.2 Asphalt mixes containing more than 15% but less than 30% of RAP**

RAP in proportions greater than 15%, but not exceeding 30%, may be used in asphalt mixes except for heavy and very heavy wearing course mixes, mixes containing polymer modified binder, or where excluded in the Project Specification. Allowance may be made for increase in binder stiffness due to hardened binder in RAP by adoption of bitumen binder one class lower in viscosity than that otherwise specified.

**R55.A1.4.3 Asphalt mixes containing more than 30% of RAP**

Asphalt mixes containing more than 30% of RAP shall only be accepted where the Contractor can demonstrate suitable manufacturing plant and quality control procedures to ensure production of hot mix asphalt as specified.

**R55.A1.5 IN-SITU AIR VOIDS**

The maximum characteristic air voids, determined in accordance with R55.5.5 shall comply with:

- *Table R55.A1.5.1 Characteristic Value of In-situ Air Voids for Wearing Course Asphalt.*
- *Table R55.A1.5.2 Characteristic Value of In-situ Air Voids for base and high fatigue bases.*

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

**Table R55.A1.5.1 – Characteristic Value of In-situ Air Voids for Wearing Course Asphalt**

<b>Asphalt Type and Thickness (mm)</b>	<b>Maximum Characteristic Value (%)</b>
All heavy and very heavy traffic asphalt wearing courses	8
All medium and light traffic wearing courses	9

**Table R55.A1.5.2 – Characteristic Value of In-situ Air Voids for Base Asphalt**

<b>Asphalt Type and Thickness (mm)</b>	<b>Maximum Characteristic Value (%)</b>
Heavy and very heavy traffic mixes in layers $\leq$ 40mm	8
Medium and light traffic mixes in layers $\leq$ 40mm	9
Heavy and very heavy traffic (except high fatigue base) mixes in layers $>$ 40mm	7
Medium and light traffic mixes in layers $>$ 40mm	8
High fatigue base	6

## APPENDIX R55.A2 STONE MASTIC ASPHALT (SMA) TARGET VALUES AND ACCEPTANCE CRITERIA

### R55.A2.1 SCOPE

This appendix sets out the requirements for Stone Mastic Asphalt and contains:

- target aggregate grading and target binder contents.
- criteria for both gyratory compaction and marshall mix design methods.
- production tolerances to be applied to the target grading and binder content.
- required characteristic air voids for in-situ SMA.

### R55.A2.2 AGGREGATE GRADING AND BINDER CONTENT

Unless otherwise specified, SMA mixes shall be designed with a target grading and binder content complying with a target grading and binder content limits given in *Table R55.A2.2: Mix Target Limits*. Bitumen shall be expressed as a percentage by mass of the total mix.

**Table R55.A2.2: Mix Target Limits**

AS Sieve Size (mm)	Mix Designation		
	SMA7	SMA10	SMA14
	Percentage passing sieve size (by mass)		
19.0			100
13.2		100	90-100
9.5	100	90-100	30-55
6.7	85-100	30-55	20-35
4.75	30-62	20-40	18-30
2.36	20-35	15-28	15-28
1.18	16-28	13-24	13-24
0.600	14-24	12-21	12-21
0.300	12-20	10-18	10-18
0.150	10-16	9-14	9-14
0.075	8-12	8-12	8-12
Binder Content (% by mass)	6.0-7.3	6.0-7.0	5.8-6.8

SMA shall contain a minimum of 0.35 % by mass of cellulose or acrylic fibre or a minimum of 0.5% by mass of mineral fibre.

### R55.A2.3 MIX DESIGN

Designs shall be undertaken in accordance with *Table R55.A2.3: Level 1 Design Requirements for Stone Mastic Asphalt Mixes*.

**Table R55.A2.3: Level 1 Design Requirements for Stone Mastic Asphalt Mixes**

Mix Type		Laboratory Compaction		Design Air Voids – target (%)	VMA – minimum (%)
Size (mm)	Traffic Category	Gyratory (cycles)	Marshall (blows)		
7	Light/Medium	80	50	4.0	19
10	Light/Medium	80	50	4.0	18
10	Heavy/Very Heavy	120	75	4.0	17
14	Heavy/Very Heavy	120	75	4.0	16

SMA shall have a maximum binder drain-off test value, at 170°C, of 0.3% by mass.

### R55.A2.4 IN-SITU AIR VOIDS

The maximum characteristic air voids shall be 7%.

Pneumatic tyred rollers shall not be used to compact SMA.

**APPENDIX R55.A3 OPEN GRADED MIXES  
TARGET VALUES AND ACCEPTANCE CRITERIA**

**R55.A3.1 SCOPE**

This appendix sets out the requirements for Open Graded (OGA) asphalt and contains:

- target aggregate grading and target binder contents.
- design criteria for both *Austroads Guide to Pavement Technology, Part 4B Asphalt, Appendix A Mix Design Procedures* and marshall mix design methods.
- production tolerances to be applied to the target values.

**R55.A3.2 AGGREGATE GRADING AND BINDER CONTENT**

Unless otherwise specified, the mixes shall be designed with a target grading and binder content complying with a target grading and binder content limits given in *Table R55.A3.2: Mix Target Limits*. Bitumen shall be expressed as a percentage by mass of the total mix.

**Table R55.A3.2: Mix Target Limits**

Sieve Size AS (mm)	Mix Designation	
	OGA10	OGA14
	Percentage passing sieve size (by mass)	
19.0		100
13.2	100	85-100
9.5	85-100	45-70
6.7	35-70	25-45
4.75	20-45	10-25
2.36	10-20	7-15
1.18	6-14	6-12
0.600	5-10	5-10
0.300	4-8	4-8
0.150	3-7	3-7
0.075	2-5	2-5
Binder Content (% by mass)	5.0-6.5	4.5-6.0

**R55.A3.3 MIX DESIGN**

ODA mixes shall comply with the volumetric (Level 1) design criteria listed in:

- *Table R55.A3.3.1: Level 1 Design Requirements for Open Graded Asphalt Mixes*; and
- Asphalt Particle Loss values listed in *Table R55.A3.3.2: Asphalt Particle Loss for Open Graded Asphalt Mixes*.

**Table R55.A3.3.1: Level 1 Design Requirements for Open Graded Asphalt Mixes**

Mix Type / Traffic Category	Laboratory Compaction		Air Voids
	Gyratory (cycles)	Marshall (blows)	
OGA Light/Medium	80	50	18-23
OGA Heavy / Very Heavy	80	50	20-25

**Table R55.A3.3.2: Asphalt Particle Loss for Open Graded Asphalt Mixes**

Mix Type/Traffic Category	Asphalt Particle Loss – maximum (%)	
	Unconditioned	Moisture conditioned
OGA Light/Medium	25	30
OGA Heavy/Very Heavy	20	35

OGA shall have a maximum binder drain-off test value, at 170°C, of 0.3% by mass except that a lower value of test temperature may be applied where that temperature will not be exceeded during manufacture and transport of the asphalt.

**APPENDIX R55.A4 FINE GAP GRADED ASPHALT (FGGA)  
TARGET VALUES AND ACCEPTANCE CRITERIA**

**R55.A4.1 SCOPE**

This appendix sets out the requirements for Fine Gap Graded Asphalt and contains:

- target aggregate grading and target binder contents.
- criteria for both gyratory compaction and marshall mix design methods.
- production tolerances to be applied to the target grading and binder content.
- required characteristics for air voids of in-situ FGGA.

**R55.A4.2 TARGET AGGREGATE GRADING AND BINDER CONTENT**

Unless otherwise specified, FGGA mixes shall be designed with a target grading and binder content complying with a target grading and binder content limits given in *Table R55.A4.2: Mix Target Limits*. Bitumen shall be expressed as a percentage by mass of the total mix.

**Table R55.A4.2: Mix Target Limits**

Sieve Size AS (mm)	Mix Designation	
	FGGA7	FGGA10
	Percentage passing sieve size (by mass)	
13.2		100
9.5	100	85-100
6.7	85-100	60-86
4.75	65-85	55-74
2.36	55-72	50-70
1.18	45-65	45-65
0.600	30-60	30-60
0.300	18-40	18-40
0.150	8-18	8-18
0.075	6-12	5-11
Binder Content (% by mass)	6.0-7.0	6.0-7.0

**R55.A4.3 MIX DESIGN**

Fine gap graded asphalt mixes shall comply with the volumetric (Level 1) design criteria listed in *Table R55.A4.3 Level 1 Design Requirements for Fine Gap Graded Asphalt Mixes*.

**Table R55.A4.3 Level 1 Design Requirements for Fine Gap Graded Asphalt Mixes**

Traffic Category	Laboratory Compaction		Design Air Voids - target
	Gyratory (cycles)	Marshall (blows)	
Light	50	35	4.0

**R55.A4.4 IN-SITU AIR VOIDS**

The maximum characteristic air voids shall be 8%.

## APPENDIX R55.A5

### ASPHALT FOR PATCHING REPAIRS TO SEALED PAVEMENTS

#### R55.A5.1 SCOPE

This appendix sets out the properties of material and placement requirements for patching repairs to sealed pavements using asphalt.

#### R55.A.2 MATERIALS

Asphalt shall be dense graded however cold mix asphalt may be approved for use in situations where it is impractical to use dense graded asphalt.

#### R55.A5.3 CONTRACT MANAGEMENT PLAN

Further to Clause R55.1.8 the Contract Management Plan shall also:

- define the conditions/locations in which the asphalt is to be used.
- define selection criteria for the use of the asphalt type, bearing in mind the timing of any planned resurfacing.
- state the nominal size and type of asphalt mix (dense, cold mix, binder type) and the intended source/s of supply.
- state how quality will be measured and monitored, both at the source and at the work site.
- describe procedures for:
  - storage and transport
  - placement

#### R55.A5.4 REQUIREMENTS

##### (a) Permanent Repairs

The asphalt shall:

- at the time of placement of a new bituminous surface over the asphalt patch, be free of volatiles, to the extent that there will be no softening of the binder in the new bituminous surfacing that might lead to a reduction of performance of that surfacing.  
To this end
  - flux oils shall not be included in the asphalt
  - the advance times between asphalt patching and any new bituminous surfacing shall not be less than the "*Desirable Minimum Time of Completion before Resealing*" of Table 7.1 "*Preparation for Resealing*" of the AUSTROADS "*Sprayed Sealing Guide*".
- be placed generally in accordance with Section 7.3.3 "*Minor Patching*" of the Austroads "*Asphalt Guide*".

##### (b) Temporary or Emergency Repairs

Cold Mix Asphalt shall comply with the AS4283 Table 1 "*Mix Requirements – Typical Grading of Mineral Matters and Proportion of Residual Binder*". All cold mix or asphalt that includes flux oils shall be removed and replaced with permanent material within six (6) months of placement.

#### R55.A5.5 COMPLIANCE

The completed patch shall not adhere to the tyres of vehicles and shall not be discernable after placement.

To this end the completed patch shall:

- after making allowance for traffic compaction be flush with or slightly raised above the existing surface.
- not deform excessively under traffic.
- not cause water to pond within the patch and/or to provide a conduit for water to enter the pavement.

## **APPENDIX R55.B DETERMINATION OF IN-SITU AIR VOIDS**

### **R55.B.1 SCOPE**

The estimation of the characteristic in-situ air voids involves;

- the measurement of the in-situ density of the asphalt.
- the determination of the reference, (maximum, zero air voids) density.
- the calculation of the relative compaction (the ratio of the in-situ density to the reference density).

### **R55.B.2 IN-SITU DENSITY**

The location of each in-situ density test shall be chosen by a method of random stratified sampling, such as that described in Specification G4, Table G4.1.

At least five (5) density tests shall be taken within each lot. Density may be established by coring or by nuclear gauge provided that the nuclear gauge and the method of testing undertaken is appropriate to asphalt and that the nuclear gauge is calibrated for the particular asphalt thickness. Density offset determinations shall be undertaken in accordance with the relevant standard.

Density testing shall be carried out as soon as practicable after completion of work.

### **R55.B.3 REFERENCE DENSITY**

The reference density shall be the mean of the five most recent maximum density measurements (AS 2891.7) of the same mix, provided that:

- the tests have been completed within the previous 3 months.
- the composition of the asphalt complies with this specification.
- there has been no change in the mix components or proportions.
- all five values fall within  $\pm 0.02t/m^2$  of the mean value.

Where 5 tests complying with the above conditions are not available, the Contractor shall carry out a minimum of 5 tests in order to establish the reference density

### **R55.B.4 CHARACTERISTIC RELATIVE COMPACTION**

Relative compaction is the percentage ratio of the in-situ density of the compacted asphalt and the reference density of the asphalt of a particular lot. It is calculated for each in-situ density test.

The characteristic relative compaction of the lot is the  $\bar{x} - 0.8*s$ , where,

$\bar{x}$  = the mean of the individual relative compaction results and

s = the sample standard deviation of the individual relative compaction results.

### **R55.B.5 CHARACTERISTIC IN-SITU AIR VOIDS**

Characteristic in-situ air voids (%) = 100 – Characteristic relative compaction.

In addition to the characteristic air voids for the lot, the report shall include the location of all test sites and the calculated air voids at each site

**APPENDIX R55.C MILLING OF ASPHALT**

**R55.C.1 SCOPE**

This appendix sets out the requirements for removal of asphalt by milling.

**R55.C.2 CONTRACT MANAGEMENT PLAN**

Further to Clause R55.1.8 the Contractor's CMP shall also include:

- details of the plant as per clause R55.C.3,
- plant inspection procedure with age and assessments of drum tools,
- traffic management plan with specific hazard warning signage,
- site management and clean up,

**R55.C.3 TRAFFIC MANAGEMENT PLAN**

Where road surfaces have been milled and are open to traffic the following sign shall be erected on all approaches until new surface has been placed.



	a	b	c	d	e	f	g	h	j	k	m	n	o	p	q
T2-207	1200	900	248	704	138	923	167	866	353	495	70	120EM	65	110	140EM

**R55.C.3 PLANT**

As a minimum, milling plant and equipment shall have the following features:

- a conveyor system to pick up and transport the milled material segments to a waiting truck or other collector;
- a tyne drum that operates in an up milling direction
- a 18mm maximum tyne/tool spacing
- water for dust suppression

The Contractor shall only mill to the specified depth and ensure that the specified milled surface texture is achieved.

Milling tynes shall be checked prior to the commencement of operations to ensure that the degree of any wear-down is not likely to reduce performance. Any worn tyne likely to reduce equipment performance shall be replaced.

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

**R55.C.4 STANDARDS OF WORK**

**R55.C.4.1 General**

The nominal depth and width of pavement to be removed shall be as specified in the works specification.

In locations where removal and replacement of asphalt or pavement is required on the same day, the rate of milling including clean up shall be at a rate consistent with the asphalt replacement process to minimise the pavement area closed to traffic.

**R55.C.4.2 Test Strip**

The Contractor shall undertake a 5m long test strip prior to commencing the full operation, to demonstrate overall compliance and that dimensional limits can be achieved.

**R55.C.4.3 Milled Surface Tolerances**

The milled surface shall be uniform with the depth within  $\pm 5\text{mm}$  of the specified depth and no point on the milled surface more than 10mm below a 3m straightedge placed on the planed surface in any direction.

Prior to opening the road to traffic after a milling operation, or placing asphalt, or leaving the site, the Contractor shall present the motorist with a clean and hazard-free surface.

**R55.C.4.4 Evidence of Compliance**

On completion of milling operations stringing checks shall be carried out by the contractor at the location where the edges of the asphalt runs are positioned and in the centre of the roadway.

The Contractor shall ensure that the recorded depth under the string line will enable the specified depth of new asphalt to be attained.

Measurements are to be recorded on an appropriate stringing sheet and supplied to the Superintendent.

If the Asphalt paver is to be crowned the depth shall be verified at the Crown Point also.

If the extent of milling is outside the specified limits the Superintendent is to be notified before the new asphalt is placed.

**R55.C.5 ASPHALT REPLACEMENT**

Where the Contract includes replacement of excavated material with asphalt, the following requirements shall apply:

- exposed granular pavement material shall be treated in accordance with relevant DIER standard specifications in particular
  - I. This specification,
  - II. G7 Asphalt production,
  - III. R40 Pavement Base and Subbase,
  - IV. R51 Bituminous Surfacing.
- all transverse and longitudinal joints shall be constructed as cold joints, and new asphalt shall be compacted flush with the existing pavement,

**R55.C.6 TEMPORARY RAMPING**

Any exposed edges resulting from the milling operation, that lie within within the trafficked area shall be ramped down at slopes no steeper than:

- longitudinal edges - 5 horizontal to 1 vertical,
- transverse Edges - 20 horizontal to 1 vertical for traffic speeds of more than 75 km/h or

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

10 horizontal to 1 vertical for traffic speeds of 75 km/h or less.

Before the new asphalt pavement is placed, all temporary ramping shall be removed by cutting back along a straight line to expose a vertical face of fully compacted parent asphalt at the specified layer depth.

**R55.C.7 HOLD POINTS**

The following Hold Points have been identified in this specification:

<b>Ref</b>	<b>Description of Hold Point</b>	<b>Nominated Work not to proceed</b>	<b>Evidence of Compliance</b>	<b>Time for Release of Hold Point</b>
R55.9	Hold Points and Deliverables	As identified under this clause	As identified under this clause	As identified under this clause
R55.C.2	Acceptance of CMP	All site work	CMP.	5 days
R55.C.4.2	Completion of test strip	Commencement of milling operation	Measurements of depths and tolerances.	1 day
R55.C.4.4	Completion of Milling	Placement of asphalt	Stringing sheets	1 day

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES  
TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

**APPENDIX R55.D JOB MIX COMPLIANCE AND CONTROL LIMITS**

Contract Details:

Contract Name:	Contract No:
Asphalt Supplier:	Plant Location:
Company Name:	Nominal Size:
Job Mix Identification:	Mix Design Date:
Asphalt Type:	
Mix Identification No:	
Traffic Category:	
Mix Design Methodology:	

Constituent Materials

Binder Type/Class	Supplier/Source:
Modifiers/Trade Name /%	Supplier/Source:
Additives/Trade Name /%	Supplier/Source:
Coarse Aggregate/rock type:	
Fine Aggregate/rock type:	
Filler/type:	

Job Mix Limits

Sieve Size mm	% Passing and % Bitumen			
	Specified Target Range	Job Mix	Specified Tolerance	Job Acceptance Limits
37.5				
26.5				
19.0				
13.2				
9.5				
6.7				
4.75				
2.36				
1.18				
0.600				
0.300				
0.150				
0.075				
Binder Content %				

In Place Required Properties:

- Specified Course Thickness mm:
- Maximum Characteristic Air Voids:

Surface Shape Class

- Permissible Tolerance in Surface Shape mm:
- Parallel to Centreline
- Transverse to Centreline

Ride Quality Measurement; Required/ Not Required

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TASMANIA  
ROADWORKS SPECIFICATION  
R55 – Asphalt Placement  
June 2011

**STATEMENT:**

The constituent materials satisfy all the requirements of this specification.

All rock products come from a G6 complying source.

The proposed asphalt mix satisfies all the requirements of this particular specification.

All the Job Mix Design information required in Table R55.3.2 is attached.

Signed:

Date:



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