

Roads

Master Specification

RD-BP-D4 – Surface Characteristics of Asphalt Pavements

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RD-BP-D4 – Surface Characteristics of Asphalt Pavements

1 General

- 1.1 This Part specifies the requirements for the design measurement, reporting and acceptance of the surface characteristics of finished flexural pavement. Rigid pavements are currently under review.
- 1.2 The surface characteristics of a finished flexural pavement must comply with this Part and Austroads Guide to Asset Management Part 15: Technical Supplements.
- 1.3 The Contractor is responsible for undertaking the testing and retesting of the finished pavement and reporting the results. Other asphalt or base course layers may require surface characteristics testing as determined by contractor and or Principal and shall also be reported.
- 1.4 No mix will be considered suitable for use unless an up to date Long Term Mix Specific Skid Management Plan has been provided and shall constitute a **Hold Point**.
- 1.5 Documents referenced in this Part are listed below:
- Austrroads: Guide to Asset Management Part 15: Technical Supplements, available from: <https://austrroads.com.au/assets/asset-management/guide-to-asset-management>.
 - Austrroads Guide to Pavement Technology Part 5: Pavement Evaluation and Treatment Design and Austrroads Guide to Pavement Technology Part 3: Pavement Surfacing available from: <https://austrroads.com.au/assets/pavements/guide-to-pavement-technology>.
 - Department: Test Methods: TP348, TP344, and TP352 available from: https://dpti.sa.gov.au/materials_technology_documents/test_procedures2.
 - Austrroads: Test Methods AG:AM-T009-16, AG:AM-T004-16, AG:AM-T012-16, AG:AM-T016-16, available from: <http://www.austrroads.com.au/assets>.
 - Little Book of Profiling published by the University of Michigan available from <http://www.umtri.umich.edu/content/LittleBook98R.pdf>.
 - Department Master Specification Parts: PC-SM1, RD-BP-D2, and RD-BP-D3 available from: https://www.dpti.sa.gov.au/contractor_documents/masterspecifications.
- 1.6 The following definitions apply to terms used in this Part:

Table RD-BP-D4 1-1 Definitions

Term	Definition
Class 1 Profiler	A device capable of measuring the longitudinal road profile at intervals of at least 250 mm with an accuracy of 0.5 mm.
International Roughness Index (IRI)	Standardised roughness measurement determined by applying a mathematical simulation of a quarter car to the measured road profile, as recorded by a Class 1 laser profiler in accordance with the Little Book of Profiling.
NAASRA Roughness Counts	Description of ride quality defined by the movement of a point on the body of a vehicle in relation to its rear axle while travelling at a predetermined speed.
New Pavement	A newly constructed pavement, reconstructed road or asphalt overlay.
Class 2 Profiler	A device capable of IRI measurement errors less than 5% (compared to class 1 profiler's measurement errors reduced to less than 2%).
GripTester	A braked fixed slip device friction tester capable of being manually pushed or towed up to the speed of 5 & 50kph for the MK1 and 5, 20 & 50kph for the MK2. This device is capable of measuring the skid resistance of a wearing course.
Thin Shape Correcting Surface	A non-structural paver laid product spread in thin lifts, down to one stone thickness capable of improving surface defects including roughness, skid resistance and texture deficiencies.

Term	Definition
OG	Open-grade or Open-graded Asphalt (OGA)
SMA	Stone Mastic Asphalt

- 1.7 The safety of the public and anyone involved in determination of surfacing characteristics including adequate traffic control shall be undertaken by the contractor.
- 1.8 For Spray Seals, surface characteristic requirements not covered by this Part can be found in Part RD-BP-D2 and Part RD-BP-D3.

2 Roughness

General

- 2.1 The finished surface of the pavement wearing course shall have a smooth longitudinal profile and the measured roughness shall not exceed the values specified in this Clause. NAASRA roughness values shall be calculated from the IRI value using Clause 2.6.
- 2.2 Roughness shall be measured with either one of the following Class 1 profilers over the sections of pavement specified:
- Two Laser Profiler.
 - Multi-Laser Profiler.
- 2.3 Roughness shall be measured in accordance with TP348 "Determination of Pavement Surface Roughness using the Two Laser Profiler".
- 2.4 The equipment shall measure longitudinal profile in both wheel paths over the wavelength range 0.5 to 50 m. Sampling shall be performed at a maximum interval of 250 mm, in each wheel path of each lane and/or ramp in the proposed direction of travel of traffic.
- 2.5 From the measured profile a wheel path IRI and lane IRI (Quarter Car) shall be determined. The lane IRI may be converted to NAASRA counts using the following equation:
- NAASRA (counts/km) = 26.49 IRI_{lane} - 1.27 (Quarter Car)
- 2.6 Traffic control shall be undertaken in accordance with the requirements of Part PC-SM1 "Provision for Traffic". In addition, in order for the profiler to gain accurate data speed, restrictions shall be in place to allow the profiler to travel uninterrupted at a speed of not less than 40 km/hr.
- 2.7 Roughness testing must be completed on lower pavement layers, including asphalt and granular courses, to meet wearing course roughness requirements. Any reduction in testing to be approved by Principal.
- 2.8 When undertaking actual site measurements the results of each run shall not deviate from the mean of the runs for each 100 m section by more than 10%.

Acceptance Limits: New Pavements

- 2.9 Unless Sub-clause "Thin Overlays – Dependence on Underlying Layers" or Sub-clause "Exclusions" (below) apply, the mean IRI & NAASRA roughness for each 100 m section of wearing course shall not exceed the maximum values specified in Table RD-BP-D4 2-1.
- 2.10 For finished wearing courses of new pavements, the following must apply:

Table RD-BP-D4 2-1 New Pavement Roughness Acceptance Limits

Location	Stage	100 m Section Average Roughness IRI m/km [NRM c/km]	
		Target Value	Unacceptable
Motorway / Freeway / Expressway & Ramps	Practical Completion	≤ 1.0 [25]	> 1.2 [30]
	Years 2 & 4 after Practical Completion	-	> 1.4 [35]
	End SOL ⁽¹⁾	-	> 1.4 [35]

Location	Stage	100 m Section Average Roughness IRI m/km [NRM c/km]	
		Target Value	Unacceptable
High Speed Environment for all other road classes (> 70 km/hr) ⁽³⁾	Practical Completion	≤ 1.4 [35]	> 1.6 [40]
	Years 2 & 4 after Practical Completion	-	> 1.75 [45]
	End SOL ⁽¹⁾	-	> 1.75 [45]
Low Speed Environment for all other road classes (≤ 70 km/hr) ⁽³⁾	Practical Completion	≤ 1.6 [40]	> 1.75 [45]
	Years 2 & 4 after Practical Completion	-	> 1.9 [50]
	End SOL ⁽¹⁾	-	> 1.9 [50]
Action / Outcome		None (acceptable)	Rework ⁽²⁾
Notes:			
1) SOL = Statute of Limitations.			
2) See Clause 2.16			
3) The "speed limit" referred to above is the speed limit imposed for the finished Works.			

Acceptance Limits: Plane and Reinstatement Pavements

2.11 For finished wearing courses of plane and reinstatement pavements, the following must apply:

Table RD-BP-D4 2-2 Plane and Reinstatement Roughness Acceptance Limits

Location	Stage	100 m Section Average Roughness IRI m/km [NRM c/km]	
		Target Value	Unacceptable
Motorway / Freeway / Expressway & Ramps	Practical Completion	≤ 1.4 [35]	> 1.6 [40]
	Years 2 & 4 after Practical Completion	-	> 1.75 [45]
	End SOL ⁽¹⁾	-	> 1.75 [45]
High Speed Environment for all other road classes (> 70 km/hr) ⁽³⁾	Practical Completion	≤ 1.6 [40]	> 1.75 [45]
	Years 2 & 4 after Practical Completion	-	> 1.9 [50]
	End SOL ⁽¹⁾	-	> 1.9 [50]
Low Speed Environment for all other road classes (≤ 70 km/hr) ⁽³⁾	Practical Completion	≤ 1.75 [45]	> 1.9 [50]
	Years 2 & 4 after Practical Completion	-	> 2.15 [55]
	End SOL ⁽¹⁾	-	> 2.15 [55]
Action / Outcome		None (acceptable)	Rework ⁽²⁾
Notes:			
1) SOL = Statute of Limitations.			
2) See Clause 2.16			
3) The "speed limit" referred to above is the speed limit imposed for the finished Works.			

Acceptance Limits: Thin Overlays/Inlays - Dependence on Underlying Layers

2.12 Where the construction of the underlying layer does not form part of the work under the Contract, and the required bituminous layer thickness is less than 50 mm, the higher of the maximum roughness levels indicated in Table RD-BP-D4 2-2 or that derived from the following equations shall not be exceeded:

- a) (NAASRA Count before overlay/inlay x 0.55) + 5 c/km.
- b) (IRI before overlay x 0.55) + 0.2 m/km.

Testing Frequency

- 2.13 The surface roughness must be tested and reported at Practical Completion, every 2 years after Practical Completion and prior to the Statute of Limitations. Failure to lodge within timeframe shall result in a penalty ten times the testing cost determined by Principal. For Thin Overlays/Inlays, the contractor shall test existing surface before new work and before any milling of asphalt layer(s). Contractor also to test rework required in Clause 2.16.

Reporting

- 2.14 For reporting purposes each lane will be divided into 100 m sections. The roughness value of each section shall be taken as the average count taken over 3 runs in the proposed direction of travel. A report detailing results of roughness testing shall be presented in both electronic and hard copy forms within the timeframe detailed below:
- a) Results of testing undertaken prior to the application of the final wearing surface shall be presented a minimum of 2 working days prior to the final wearing surface being applied. Principal to decide if roughness testing is required for any asphalt or granular layers other than wearing course.
 - b) Results of testing undertaken on the final wearing course shall be presented within 5 working days after measurements are taken.
- 2.15 The report shall contain the following information in addition to documentation provided as part of TP348 and General Reporting Requirements highlighted in section 8:
- a) Left wheel path roughness (IRI).
 - b) Right wheel path roughness (IRI).
 - c) Quarter car roughness (IRI) for each run.
 - d) Quarter car roughness (NAASRA counts) for each run.
 - e) Mean lane roughness together with the percentage deviation from the mean.

Rectification Work

- 2.16 Any Lots with test results within Unacceptable limits must be replaced at the Contractor's full cost. Contractor to provide proposal for remediation of sufficient scope to comply with all requirements of this Part. All treatments require Principal approval. For test results between Target and Unacceptable a price penalty of 10% reduction for each 1.0 NRM or part thereof above Target shall apply.

3 Lane Shape/Rutting

General

- 3.1 The pavement wearing course shall have a smooth transverse lane shape. Lane shape or rutting must meet acceptance limits as detailed and must not lead to any water ponding or have visible double ruts within a wheel path.
- 3.2 Lane shape at construction and lane rutting after trafficking is based on the maximum rut depth under a 3m straight edge or 1.2m straight edge in localised areas. A simulated 3m straight edge is the Rut Index that calculates the average difference between each wheel path height and the centre height that gives adequate rutting depth measurements. Any actual measurement overrides the simulated measurement.
- 3.3 Lane shape/rutting must be measured by a Class 2 or higher profile measuring device in accordance with AG:AM-T009-16 "Pavement Rutting Measurement with a Laser Profiler". Sampling shall be performed at a maximum interval of 250 mm, in each wheel path of each lane and/or ramp in the proposed direction of travel of traffic.
- 3.4 Traffic control shall be undertaken in accordance with the requirements of Part PC-SM1 "Provision for Traffic". In addition, in order for the profiler to gain accurate data speed, restrictions shall be in place to allow the profiler to travel uninterrupted at a speed of not less than 40 km/hr.

Acceptance Limits

3.5 For finished wearing courses, the following must apply:

Table RD-BP-D4 3-1 Lane Shape/Rutting Acceptance Limits

Stage	100 m Acceptable Section Average Lane Shape/Rutting (mm)
Practical Completion	≤ 3
Years 2 & 4 after Practical Completion	≤ 5
End SOL ⁽¹⁾	≤ 5

Notes:

1) SOL = Statute of Limitations.

3.6 Should rutting occur from trafficking outside of these specification limits at any stage after practical completion the contractor will determine, with Principals approval, if failure is due to supporting pavement shape loss or asphalt.

Testing Frequency

3.7 The minimum frequency for lane rutting testing and reporting must be at Practical Completion, every 2 years after Practical Completion, and prior to the Statute of Limitations. Failure to lodge within timeframe shall result in a penalty ten times the testing cost determined by Principal.

Reporting

3.8 A report detailing results of shape/rut testing shall be presented in both electronic and hard copy forms. The report shall contain the following information in addition to documentation provided as part of AM/T009 and General Reporting Requirements highlighted in section 8:

- a) Left wheel path rut depth plotted against section distance.
- b) Right wheel path rut depth plotted against section distance.
- c) Mean lot rut depth for each wheel path and each lane together with the standard deviation.

Rectification Work

3.9 Any Lots with test results outside acceptance limits or where any water ponding occurs, must be reworked at the Contractor's full cost. Contractor to provide proposal for remediation of sufficient scope to comply with all requirements of this Part such as pavement strength and or asphalt air void testing.

4 Cracking

General

- 4.1 Cracking extent must be determined via visual inspection and presented on a scaled graphical pavement condition survey, utilising the distress categories presented in the "Austroads Guide to Pavement Technology Part 5: Pavement Evaluation and Treatment Design - Appendix A – Identification, Causes and Treatment of Visual Distress".
- 4.2 The extent of cracking must be reported at Practical Completion, every 2 years after Practical Completion, and prior to the Statute of Limitations.
- 4.3 Traffic control shall be undertaken in accordance with the requirements of Part PC-SM1 "Provision for Traffic" during inspection if necessary.

Maximum Cracking Levels

4.4 Cracking must be assessed through a joint site inspection between the Principal and Contractor's representatives. There must be no cracking in the pavement at Practical Completion or prior to the Statute of Limitations.

Reporting

- 4.5 A visual condition survey report including detail results of cracking shall be presented in both electronic and hard copy forms. The report shall contain the following information in addition to General Reporting Requirements highlighted in Section 8:
- Visual condition survey report.
 - Description of cracking locations including lane number, chainage or road running distance.
 - Cracking type and extent including crack width.
 - Photographic evidence.

Rectification Work

- 4.6 Any Lots with cracking must be reworked at the Contractor's full cost. Contractor to provide proposal for remediation prior to the Statute of Limitations and of sufficient scope to comply with all requirements of this Part. All treatments require Principal approval.

5 Skid Resistance

General

- 5.1 The finished surface of the pavement wearing course shall have adequate skid resistance to safeguard road user's safety and meet skid resistance requirements detailed in this clause as a minimum.
- 5.2 The skid resistance of Open Grade (OG) and Stone Mastic Asphalt (SMA) wearing surfaces must be measured in both the inner and outer wheel paths in accordance with the Department's Test Method TP344 "Determination of Pavement Surface Skid Resistance Using Griptest" and reported at 100 m intervals. The testing interval is to be set at 10 m or 1 m dependent on Griptest configuration and in accordance with TP344.
- 5.3 Traffic control shall be undertaken in accordance with the requirements of Part PC-SM1 "Provision for Traffic" if required.
- 5.4 Seasonal variation in skid resistance is characteristic of Open Grade and Stone Mastic Asphalts and discussed in paper titled "Seasonal variation in Skid Resistance of South Australian Aggregates" (van Loon, H 2014).

Acceptance Limits

- 5.5 Skid Resistance levels on the finished wearing courses for the main alignment and ramps must exceed the skid resistance acceptance levels as per Table RD-BP-D4 5-1.

Table RD-BP-D4 5-1 Wearing Course Skid Resistance Acceptance Limits

Road Situation	Minimum Grip No.
Difficult sites - steep grades (>5%), traffic light approaches, tight bends <400m), roundabouts and pedestrian crossings.	0.50
Other sites	0.45
Early life - refer to Clause 5.6	0.35

- 5.6 During wearing course's early life, skid resistance shall meet the following levels and all tests reported to the Principal:
- A lowered safe travelling speed and appropriate signage to be applied on opening to traffic and maintained until bitumen has been worn from wearing course aggregate demonstrated by achievement of 0.35 Grip units, whereupon an increase in operating speed and signage can be applied.
 - Full operational speed can be applied once 0.45 Grip units has been achieved.

- c) For high speed environments (> 70 km/hr) sufficient testing to be carried out each summer to demonstrate the “summer” minimum Grip units as suggested by Table RD-BP-D4 5-3.

All speed limits and appropriate signage (including removal) to be determined with the Principal.

Testing Frequency

- 5.7 The skid resistance must be tested and reported to the Principal at the following frequencies for all mixes other than Dense Graded mixes:

Table RD-BP-D4 5-2 Wearing Course Skid Resistance Testing Frequency

LOCATION	Testing Frequency for Wearing Course			
	Practical Completion	Early Life Testing ⁽¹⁾	Every 2 Years After Project Completion	Prior to Statute of Limitations
Motorway / Freeway / Expressway & Ramps	yes	Yes	yes	yes
High Speed Environment for all other road classes (> 70 km/hr)	yes	Yes	Yes	yes
Low Speed Environment for all other road classes (≤ 70 km/hr)	yes	-	yes	yes

Notes:

1) SMA and OG wearing course can exhibit low skid resistance in early life until the binder has worn off the aggregate surface.

- 5.8 Early life skid resistance shall be tested to achieve the above levels adopting the following minimum frequencies, processes and stages with all tests reported to the Principal for Open Grade and Stone Mastic Asphalt:
- For Clause 5.6(a), every week following opening to traffic.
 - For Clause 5.6(b), every two weeks after lifting speed for Clause 5.6(a)
 - For Clause 5.6(c), six times a year for OG and SMA as listed in Table RD-BP-D4 5-3 below – refer to Clause 5.9.

Table RD-BP-D4 5-3 Idealised OG/SMA Skid Resistance Monitoring Dates

Idealised OG/SMA Skid Monitoring Date	Description
01 August	Skid resistance winter maximum
01 December	Towards Summer
01 January	Low summer skid resistance
01 February	Skid resistance summer minimum
01 March	Low Summer skid resistance
01 April	Away from Summer

Long Term Mix Specific Skid Management Report

- 5.9 A long term mix specific skid management report shall be prepared by the contractor using data tested at a minimum of Table RD-BP-D4 5-3 frequencies and updated twice yearly for a minimum of five years. Principal to be supplied the latest report and electronic & hard copies of the last six months of testing. The paper titled “Seasonal Variation of South Australian Aggregates” (van Loon, 2014) gives a method for determining cyclical variation of skid resistance evident for asphalt surfacing aggregates. This provides the contractor with a method of determining whether the aggregate selected for a mix provides the level of reliability required by this specification.

Reporting

- 5.10 A report detailing results of grip testing shall be presented in both electronic and hard copy forms. The report shall contain the following information in addition to documentation provided as part of TP344 and General Reporting Requirements highlighted in section 8:
- Left wheel path grip number plotted against section distance
 - Long term mix specific skid management report.

Rectification Work

- 5.11 Where skid resistance results are below acceptance limits the Contractor must identify the cause and carryout suitable treatments at the Contractor's full cost and be of sufficient scope to comply with all requirements of this Part. All treatments require Principal approval.

6 Texture

General

- 6.1 The finished surface of the pavement wearing course shall have a uniform texture in accordance with the acceptance limits detailed.
- 6.2 The texture depth must be measured by a Class 1 texture measuring device, in accordance with the Department's Test Method TP352 "Determination of Pavement Surface Texture Using the Laser Profiler". The texture depth must be measured in both the inner and outer wheelpaths of all lanes and ramps and converted to equivalent sand patch texture depth (SPT). Sampling shall be performed at a maximum interval of 250 mm.
- 6.3 Traffic control shall be undertaken in accordance with the requirements of Part PC-SM1 "Provision for Traffic". In addition, in order for the profiler to gain accurate data speed, restrictions shall be in place to allow the profiler to travel uninterrupted at a speed of not less than 40 km/h and not greater than 95 km/h.

Acceptance Limits

- 6.4 Wearing course surface texture is dependent on road function in Table RD-BP-D4 6-1 and on mix type in Table RD-BP-D4 6-2. Surface texture target values are provided in Table RD-BP-D4 6-2 as preferred surface texture mean values for each run. Results should be normally distributed around these target values.

Table RD-BP-D4 6-1 Wearing Course Surface Texture Levels

Road Function	Texture Depth SPT (mm)
Freeways and other high-class facilities with free-flowing traffic conditions	≥ 0.6
Highways (greater than 80km/h), Other major main roads to stopping and turning (less than 80km/h)	≥ 0.6
Other local roads (sealed)	≥ 0.3

- 6.5 For finished wearing courses, the following must apply:

Table RD-BP-D4 6-2 Wearing Course Surface Texture Acceptance Limits

Wearing Course	Stage ⁽⁴⁾	Texture Depth SPT (mm)		
		Target Value	Unacceptable - Low	Unacceptable - High
Open Graded Asphalt, OG14	Practical Completion ⁽¹⁾	≥ 1.2	< 1.0	> 1.5
	Every 2 Years after Practical Completion	-	< 0.9	-
	End SOL ⁽²⁾	-	< 0.9	-
Stone Mastic Asphalt, SMA10	Practical Completion ⁽¹⁾	≤ 1.1	< 0.7	> 1.2
	Every 2 Years after Practical Completion	-	< 0.6	-

Wearing Course	Stage ⁽⁴⁾	Texture Depth SPT (mm)		
		Target Value	Unacceptable - Low	Unacceptable - High
Dense Mix Asphalt, AC10	End SOL ⁽²⁾	-	< 0.6	-
	Practical Completion	≤ 0.4	< 0.3	> 0.5
	Every 2 Years after Practical Completion	-	< 0.3	-
	End SOL ⁽²⁾	-	< 0.25	-
Fine Dense Mix Asphalt, Ac10	Practical Completion	≤ 0.3	< 0.1	> 0.4
	Every 2 Years after Practical Completion	-	-	-
	End SOL ⁽²⁾	-	-	-
Action / Outcome		None (acceptable)	Rework ⁽³⁾	Rework ⁽³⁾

Notes:

1) Texture depth for OG/SMA is more accurate after pavement has been given time to age due to binder reflectivity.

2) SOL = Statute of Limitations.

3) See Clause 6.8

4) Minimum of two tests

Testing Frequency

6.6 The texture depth must be tested and reported within two months to the Principal at Practical Completion, at each 2 years after Practical Completion and prior to the Statute of Limitations. Failure to lodge within timeframe shall result in a penalty ten times the testing cost determined by Principal.

Reporting

6.7 A report detailing results of texture depth testing shall be presented in both electronic and hard copy forms. The report shall contain the following information in addition to documentation provided as part of TP352 and General Reporting Requirements highlighted in section 8:

- a) Inner wheel texture depth plotted against section distance.
- b) Outer wheel texture depth plotted against section distance.
- c) Mean inner and outer wheel path texture depth per lot together with the standard deviation.

Rectification Work

6.8 Any Lots with test results outside acceptance limits must be reworked at the Contractor's full cost. Contractor to provide proposal for remediation and be of sufficient scope to comply with all requirements of this Part. All treatments require Principal approval.

7 General Test Methods and Measurement Procedure

General Measurement Requirements

- 7.1 Wheel paths are deemed to be 750 mm from the centre of each lane (width of dedicated parking lanes to be excluded from lane width).
- 7.2 The location of the start and finish chainages where testing is to be undertaken shall be clearly marked out.
- 7.3 For measurements where no pavement marking is present, including granular base, the lane lines and proposed medians at 30 m intervals shall be clearly marked out.
- 7.4 Prior to testing for the appropriate surface characteristic the Contractor shall ensure that:
 - a) the pavement is free of loose material and debris when testing is undertaken;

- b) for unbound granular bases, measurements shall be undertaken prior to sweeping of the pavement; and
 - c) free water is not present on the pavement when testing is undertaken.
- 7.5 Measurements, daily checks and calibration of measuring devices shall be undertaken in accordance with the manufacturer's instructions and where applicable the Department and Austroads procedures listed in Table RD-BP-D4 7-1.

Exclusions

- 7.6 Unless specified otherwise in the Contract Specific Requirements or by the Principal, those areas that are to be excluded from the requirements of this Part are:
- a) roundabouts;
 - b) railway lines and Bridge Joints (35 m after the event);
 - c) intersections (stop bar to stop bar);
 - d) inspection pit covers and surface defects related to inspection pit covers within the wheel paths (15 m including the event);
 - e) side streets specified in the Contract Specific Requirements deemed to affect pavement ride quality (the width of the side street plus 30 m after the event); and
 - f) Principal to decide if surface defects related to existing culverts which are not part of the work under the Contract (width of culvert plus 30m after the event).

Repeatability Requirements

- 7.7 Prior to measurements of each test in Table RD-BP-D4 7-1 commencing, a series of 5 runs for each operator over the section of road shall be undertaken, unless proof of such repeatability testing, carried out in the 6 months prior to the testing, can be provided and approved by Principal. All 5 runs shall be completed on the same day over the same section of road.
- 7.8 The results of each of the 5 runs shall meet the repeatability requirements of repeatability test procedures/methods listed in Table RD-BP-D4 9-1. Only those operators that have satisfied these repeatability requirement will be permitted to undertake surface characteristic testing. The test data to be supplied under the requirements of this Part shall be provided prior to any further data collection taking place.

Table RD-BP-D4 7-1 Table of Test Procedures

Surface Characteristic	Test Procedure/Method	Repeatability Test Procedure/Method
Roughness	TP348	AG:AM-T004-16
Lane Shape/Rutting	AG:AM-T009-16	AG:AM-T012-16
Skid Resistance	TP344	-
Texture	TP352	AG:AM-T016-16

- 7.9 Skid Resistance testing using contractor GripTester shall be calibrated against the Department's GripTester by testing together on same day and conditions, on predetermined sites. Contractor data shall use an appropriate factor to not differ from the Department's data. Calibration is to be carried out on a minimum yearly basis.
- 7.10 Any anomalies shall constitute a **Hold Point**.
- 7.11 If any electronic or mechanical failure occurs on the test vehicle that are likely to affect the repeatability or accuracy of data collected, evidence shall be provided that demonstrates that results before and after the incident match.

8 General Reporting Requirements

- 8.1 Specific reporting requirements for the testing of each surface characteristics are highlighted in each section of this master specification part.
- 8.2 The latest Long Term Mix Specific Skid Management report shall be provided to the Principal prior to commencement of work, and whenever an update is made.
- 8.3 A report detailing results of testing shall be presented in both electronic and hard copy forms within time frames above.
- 8.4 Raw test data shall be included along with any prepared report and presented electronically to the Principal.
- 8.5 For reporting purposes test data will be divided into lots which will in-turn be divided into 100 m sections per lane. Lengths less than 100 m must be included in the previous adjacent 100 m length. Full reporting of exclusions in Clause 7.6 to be provided.
- 8.6 The report shall contain the following information in addition to documentation provided as part of relevant Department testing procedures and/or Austroads test methods:
- a) Road number.
 - b) Surfacing type.
 - i) Including details of asphalt mix, binder, aggregate size and source.
 - c) Survey date (yymmdd).
 - d) Daily calibration check results in alignment with relevant test procedures/methods.
 - e) Lot number and length (m).
 - f) Start and Finish Chainage referenced to the road running distance or chainage.
 - g) Direction of travel and lane number.
- 8.7 Lane identification shall comply with the following convention:
- a) The lane where the direction of travel coincides with increasing road running distance is deemed to be the left lane.
 - b) Lane numbers (i.e. L1, L2...) shall increase with distance from the median or centre line.
- 8.8 All results shall be presented with other lot documentation for the wearing course in a predetermined grid format and in an approved electronic format.

9 Table of Test Procedures

- 9.1 The Contractor shall use the test procedures specified in Table RD-BP-D4 9-1 (refer http://www.dtei.sa.gov.au/dtei_contractor_documents) to verify conformance with the Specification:

Table RD-BP-D4 9-1 Test Procedures

Test	Test Procedure
Determination of Pavement Surface Roughness using the Two Laser Profiler	TP348
Determination of Pavement Surface Skid Resistance Using GripTester	TP344
Determination of Pavement Surface Texture Using the Laser Profiler	TP352
Pavement Rutting Measurement with a Laser Profiler	AG:AM-T009-16

10 Hold Points

- 10.1 The following is a summary of Hold Points referenced in this Part:

Table RD-BP-D4 10-1 Hold Points

Document Ref.	Hold Point	Response Time
1.4	Provision of Long Term Mix Specific Skid Management Plan	10 Working Days
7.10	Anomalies in test data	1 Working Day