



ACT
Government

FLEXIBLE PAVEMENTS 04

MUNICIPAL
INFRASTRUCTURE
TECHNICAL
SPECIFICATION
04 - FLEXIBLE PAVEMENTS

Transport Canberra and
City Services

July 2019



| | |
|---------------------|------------------------------|
| Publication Number: | MITS 04 Edition 1 Revision 0 |
|---------------------|------------------------------|

| | |
|-----------------|-----------|
| Date of Effect: | July 2019 |
|-----------------|-----------|

Supersedes: Standard Specification for Urban Infrastructure Works Section 4
Edition 1 Revision 0 September 2002

| | | |
|--------------|------------|-----------------------------------|
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|--------------|------------|-----------------------------------|

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Document Information

| | |
|----------|-----------------|
| Document | Key Information |
|----------|-----------------|

Document Title MITS 04 Flexible Pavement Construction

| | |
|------------------|--|
| Next review date | |
|------------------|--|

Key words

| | |
|------------------------|---|
| AUS-SPEC Base Document | 1141 Flexible pavement base and subbase |
|------------------------|---|

Revision Register

| Edition/ Revision Number | Clause Number | Description of Revision | Authorised By | Date |
|--------------------------|---------------|-------------------------|---------------|------|
|--------------------------|---------------|-------------------------|---------------|------|

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1 FLEXIBLE PAVEMENT CONSTRUCTION

1.1 General

1.1.1 Responsibilities

1.1.1.1 General

Requirement: Provide the following:

- > Flexible pavement base and subbase, including supply, spreading, compaction and trimming of crushed rock, gravel and suitable soil pavement layers as documented.

Exclusions: This Specification does not include gravel surfaced pavements.

1.1.2 Cross references

General: The following documents are related to this Specification:

1.1.2.1 ACT Legislation

Road Transport (General) Act

Road Transport (Safety and Traffic Management) Act

Road Transport (Mass, Dimensions and Loading) Act

Road Transport (Safety and Traffic Management) Regulation

Territory Plan and related Codes

Public Roads Act

1.1.2.2 Specifications

Requirement: Conform to the following

MITS 00 Introduction

MITS 01 Traffic Management

MITS 02 Earthworks

MITS 06 Concrete kerbs, footpaths and minor works

TRITS 04 Flexible pavement constructions

1.1.2.3 Design Standards

General: The following Design Standards are related to this Specification:

MIS 02 Earthworks and site grading

MIS 03 Pavement design

MIS 04 Subsurface drainage

1.1.2.4 TCCS Reference Documents

General: The following TCCS reference documents are related to this specification:

- Reference document 4 Protection of public landscape assets
- Reference document 7 Operational acceptance submissions
- Reference document 8 Works as executed quality records
- Reference document 9 Final acceptance submissions
- Reference document 10 Landscape consolidation
- Reference document 11 Drafting Standard for Civil and Landscape works

1.1.3 Referenced documents

1.1.3.1 Standards

General: The following documents are incorporated into this Specification by reference:

Australian standards

- AS 1141 Methods for sampling and testing aggregates
- AS 1141.3.1 Sampling - aggregates
- AS 1141.5 Particle density and water absorption of fine aggregates
- AS 1141.6 Particle density and water absorption of coarse aggregates
- AS 1141.8 Water soluble fraction of filler
- AS 1141.11 Particle size distribution
- AS 1141.12 Materials finer than 75 micrometre in aggregates
- AS 1141.14 Particle shape, by proportional calliper
- AS 1141.17 Voids in dry compacted filler
- AS 1141.22 Wet/dry strength variation
- AS 1141.23 Los Angeles value
- AS 1141.24 Aggregate soundness - Evaluation by exposure to sodium sulphate solution
- AS 1141.25.1 Degradation factor – Source rock
- AS 1141.25.3 Degradation factor - Fine aggregate
- AS 1141.41 Polished aggregate friction value
- AS 1141.42 Pendulum friction test
- AS 1141.50 Resistance to stripping of cover aggregates from binders
- AS 1141.52 Unconfined cohesion of compacted pavement materials
- AS 1160 Bituminous emulsions for construction and maintenance of pavements
- AS 1289 Methods of testing soils for engineering purposes

| | |
|---------------|---|
| AS 1289.2.1.1 | Soil moisture content tests - Determination of the moisture content of a soil - Oven drying method (standard method) |
| AS 1289.3 | Soil classification tests |
| AS 1289.3.1.1 | Determination of the liquid limit of a soil - Four point Casagrande method |
| AS 1289.3.3.1 | Calculation of the plasticity index of a soil |
| AS 1289.3.4.1 | Determination of the linear shrinkage of a soil - Standard method |
| AS 1289.3.6.1 | Determination of the particle size distribution of a soil - Standard method of analysis by sieving |
| AS 1289.3.7.1 | Determination of the sand equivalent of a soil using a power-operated shaker |
| AS 1289.5 | Soil compaction and density tests |
| AS 1289.5.1.1 | Determination of the dry density/moisture content relation of a soil using standard compactive effort |
| AS 1289.5.3.2 | Determination of the field dry density of a soil - Sand replacement method using a sand pouring can, with or without a volume displacer |
| AS 1289.5.4.1 | Compaction control test - Dry density ratio, moisture variation and moisture ratio |
| AS 1289.5.7.1 | Compaction control test - Hilf density ratio and Hilf moisture variation (rapid method) |
| AS 1289.5.8.1 | Determination of field density and field moisture content of a soil using a nuclear surface moisture-density gauge - Direct transmission mode |
| AS 1289.6.1.1 | Soil strength and consolidation tests - Determination of the California Bearing Ratio of a soil - Standard laboratory method for a remoulded specimen |
| AS 5101 | Methods for preparation and testing of stabilized materials |
| AS 5101.4 | Unconfined compressive strength of compacted materials |

1.1.3.2 Other publications

Proprietary products: To *TCCS Products previously considered for use list*

ARRB

ARRB Group Sealed local roads manual – Guidelines to good practice: Design, construction, maintenance and rehabilitation of pavements.

Austroads

| | |
|---------|--|
| AGPT | Austroads Guide to Pavement Technology |
| AGPT04A | Part 4A: Granular base and subbase materials |
| AGPT04D | Part 4D: Stabilised materials |
| AGPT04E | Part 4E: Recycled materials |
| AGPT04J | Part 4J: Aggregate and source rock |
| AGPT05 | Part 5: Pavement evaluation and treatment design |
| AP-T37 | Geotextile reinforced seals |

RMS Specifications

| | |
|-------|---|
| R71 | Unbound and Modified Pavement Course |
| R106 | Sprayed Bituminous Surfacing (with cutback bitumen) |
| R107 | Sprayed Bituminous Surfacing (with polymer modified bitumen) |
| R109 | Bituminous slurry surfacing |
| R110 | Coloured surface coatings for bus lanes and cycle ways |
| R111 | Sprayed Bituminous Surfacing (with emulsified bitumen) |
| R116 | Heavy Duty Dense Graded Asphalt |
| R117 | Light Duty Dense Graded Asphalt |
| R118 | Crumbed Rubber Asphalt |
| R119 | Open Graded Asphalt |
| R121 | Stone Mastic Asphalt |
| R123 | Thin Open Graded Asphalt Surfacing |
| M211 | Crack Sealing Bituminous Surfaces |
| NR106 | Guide to QA Specification R106 - Sprayed Bituminous Surfacing (With Cutback Bitumen) |
| NR107 | Guide to QA Specification R107 - Sprayed Bituminous Surfacing (With Polymer Modified Bitumen) |
| 3151 | Cover Aggregate for Bituminous Surfacing |
| 3153 | Reclaimed Asphalt Pavement Material |

RMS test methods

| | |
|-------|---|
| T102 | Pre-treatment of road construction materials by compaction |
| T109 | Plastic Limit and Plasticity Index of road construction materials |
| T130 | Dry density/moisture relationship of road construction materials (blended in the laboratory with cementitious binders). |
| T171 | Modified Texas triaxial compression test pavement materials |
| T231 | Frictional Resistance by Pendulum Tester |
| T239 | Fractured faces of coarse aggregate |
| T276 | Foreign materials content of recycled crushed concrete |
| T278 | Aggregate shape by the ratio of greatest to least dimension |
| T1015 | Microbiology of water used in road works (thermo tolerant coliforms) |

Other Test Methods

AASTO T304 Uncompacted void content of fine aggregate

ISSA Technical Bulletin 145 Determination of Methylene Blue Adsorption Value (MBV) of mineral aggregate fillers and fines

1.1.4 Interpretation

1.1.4.1 Abbreviations

General: For the purpose of this Specification, the definitions of terms used to define the components of the road reserve are in conformance with *AS 1348, Glossary of Austroads Terms* and *AGRD03*, the definitions given below also apply:

| | |
|--------------|---|
| ARRB: | Australian Road Research Board. |
| ASTM: | American Society for Testing and Materials. |
| CBR: | California Bearing Ratio. |
| CRB: | Crushed rock base. |
| CRS: | Crushed rock subbase. |
| EPA: | Environmental Protection Authority, ACT Government, and its successors. |
| NATA: | National Association of Testing Authorities. |
| NGS: | Natural gravel subbase. |
| PAFV: | Polishing Aggregate Friction Value. |
| ppm: | parts per million. |
| RCCB: | Recycled crushed concrete base. |
| RCCS: | Recycled crushed concrete subbase. |
| RMS: | NSW Roads and Maritime Services, NSW Government, and its successors. |
| SSD: | Saturated surface dry. |
| TCCS: | Territory and Municipal Services, ACT Government, and its successors. |
| UCS: | Unconfined compressive strength. |

1.1.4.2 Definitions

General: General: For the purpose of this Specification, the definitions of terms used to define the components of the road reserve are in conformance with *AS 1348, Glossary of Austroads Terms* and *AGRD03*, the definitions given below also apply:

Base: Layer(s) of material forming the uppermost structural element of a pavement and on which the surfacing may be placed which may be composed of fine crushed rock, natural gravel, broken stone, stabilised material, asphalt or Portland cement concrete.

Binder: A material used in the mix to improve temperature susceptibility, response to transient loads and cohesive strength.

Bound material: A granular or subgrade material to which a binder has been added to improve structural stiffness.

Flexible pavement: A pavement which obtains its load-spreading properties from inter-granular pressure, mechanical interlock and cohesion between the particles of the pavement material.

Modified material: Granular materials to which small amounts of stabilising agent have been added to improve their performance without causing a significant increase in structural stiffness.

Pozzolan: A siliceous or alumino siliceous material, which in itself possesses little or no cementitious value but which in finely divided form may be mixed with lime or Portland cement to form a cementitious material.

Subbase: The material laid on the subgrade below the base either for the purpose of making up additional pavement thickness required over the subgrade, or to prevent intrusion of the subgrade into the base, or to provide a working platform.

Unbound material: A granular material with no significant capacity to resist tensile stresses.

Underlying layer: The pavement layer directly below the layer in question, refer to the **Pavement nomenclature figure**.

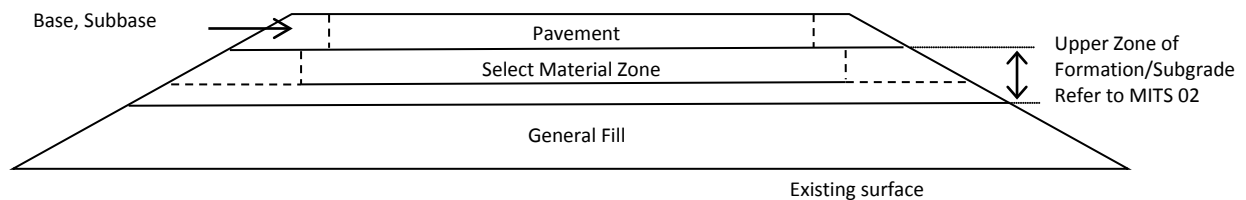


Figure 4-1 Pavement nomenclature figure

1.1.4.3 Submissions

Drawings: Prepare drawings or other documentation to record extent and constitution of final works in accordance with Requirements for Works as Executed quality records, TCCS.

1.1.5 Hold points and witness points

1.1.5.1 Notice

General: Give written notice to the Authorised person so that the documented inspection and submissions may be made to the **Hold point table** and the **Witness point table**.

Table 4-1 Hold point table

| Item | Clause title | Requirement | Notice for inspection | Release by |
|----------------------------------|--|---|--|-------------------|
| Pre-Construction Planning | | | | |
| 4.1 | Proposed materials | Prepare and submit schedule detailing material properties including NATA test results | 5 working days before ordering materials | Authorised Person |
| 4.2 | Bound or modified materials | Complete and submit Annexure A of RMS R71 | 5 working days before ordering materials | Authorised Person |
| 4.3 | Variations to approved materials | Submit details of changes to approved materials | 5 working days before use in works | Authorised Person |
| Materials | | | | |
| 4.4 | Alternative materials | Submit details of alternative material including test results | 5 working days before ordering materials | Authorised Person |
| 4.5 | Lime modification | Submit proposals to modify materials | 5 working days before placing | Authorised Person |
| 4.6 | In-situ lime modification | Submit proposals for the in-situ use of hydrated lime or quicklime | 5 working days before activity | Authorised Person |
| | Spreading | | | |
| 4.7 | Underlying layer | Inspection to determine suitability of underlying layer | 1 working day before placing next layer | Authorised Person |
| 4.8 | Temperature | Submit proposal to proceed outside allowable conditions | 1 working day before placement | Authorised Person |
| Execution | | | | |
| 4.9 | Subsequent layers | Submit completed test results of previous layer | 1 working day before placing next layer | Authorised Person |
| 4.10 | Lots for acceptance | Submit compaction test results | 1 working day after testing | Authorised Person |
| 4.11 | Compaction requirements and acceptance | Submit evidence that compaction is within tolerances | 1 working day after test results | Authorised Person |

| Item | Clause title | Requirement | Notice for inspection | Release by |
|-------------|---|---|-------------------------------------|-------------------|
| 4.12 | General | Submit lot survey reports | 1 working day before next activity | Authorised Person |
| 4.13 | Corrective action - Rejected unbound layers | Submit proposal for corrective action | 1 working day before next activity | Authorised Person |
| 4.14 | Corrective action - Rejected bound layers | Submit proposal for corrective action | 3 working days before next activity | Authorised Person |
| 4.15 | Extent of removal | Submit proposal to remove less than full width | 1 working day before next activity | Authorised Person |
| 4.16 | Prior to replacement | Give notice for inspection of underlying material | 1 working day before next activity | Authorised Person |
| 4.17 | Replacement | Submit proposed methods to make good | 1 working day before next activity | Authorised Person |

Table 4-2 Witness point table

| Item | Clause title | Requirement | Notice for inspection |
|----------------------------------|----------------------------------|--|-------------------------------|
| Pre-Construction Planning | | | |
| 4.1 | Delivered materials | Give notice for inspection | Progressive |
| Materials | | | |
| 4.2 | Location | Give notice of proposed alternative locations | 2 weeks before stockpiling |
| 4.3 | Sampling | Demonstrate test results from unbound stockpiles | 3 working days after delivery |
| Execution | | | |
| 4.4 | Compaction | Give notice of proposal to use alternative layer thickness | 2 weeks before activity |
| 4.5 | Rework | Give notice for inspection of reworked wetted up layer | Progressive |
| 4.6 | Curing of bound materials | Give notice of water curing activities | Progressive |
| 4.7 | Layer width | Give notice of completion of layer width | Progressive |
| 4.8 | Subbase surface deviation | Give notice of completed subbase surface | Progressive |
| 4.9 | Base surface deviation | Give notice of completed base surface | Progressive |
| 4.10 | Base adjacent to kerb and gutter | Give notice of completed base surface | Progressive |
| 4.11 | Removal of Loose stones | Give notice of completed surface | Progressive |

1.2 Pre-construction planning

1.2.1 Design and control of base and subbase materials

1.2.1.1 Proposed materials

Alternatives: Base and subbase materials shall conform to either this specification or to the requirements of the applicable RMS material specification including quality records and hold points.

Schedule: Submit a schedule detailing the material properties of the proposed base and subbase, including sources of supply and the proposed type and proportion of any binder. Include test results from a NATA registered laboratory as evidence that material properties conform to the requirements of this Specification.

This is a **HOLD POINT**.

1.2.1.2 Modified materials

Stabilisation: If the proposed base or subbase is a modified material, the materials and construction must be in accordance with *RMS R71 Unbound and Modified Pavement Course*. In particular, submit a nominated mix.

This is a **HOLD POINT**.

1.2.1.3 Approved base and subbase

General: Once the proposed materials have been approved, they are known as the approved base and subbase.

Pre-approval: Proposed base or subbase may be pre-approved under all of the following conditions:

- > If the base or subbase was used in a separate contract within 12 months of proposed works date.
- > If full approved details have been previously used.
- > If the material properties remain unchanged from that previously approved.
- > If the in-service performance of the base or subbase incorporating the nominated materials is acceptable.

1.2.1.4 Variations to approved materials

Written approval: Submit details of any changes to the approved base and subbase or source of supply.

This is a **HOLD POINT**.

Non-conformance: Any change to the approved base and subbase, without approval will be considered a non-conforming material and may be rejected.

1.3 Materials

1.3.1 Unbound base and subbase materials

1.3.1.1 General

Standard: To *AGPT04A* and *ARRB - Sealed local roads manual* with properties as listed in this Specification.

Sampling and testing: To *AS 1289* and *AS 1141*.

Requirement: Provide unbound granular materials, including blends of two or more different materials, which when compacted develop structural stability and are uniform in grading and physical characteristics. Base and subbase materials shall be manufactured from hard, durable stone or materials free of clay lumps, organic matter or other deleterious substances.

Production: Materials may be produced by crushing plant or naturally occurring granular materials. Methods and properties to conform to this Specification. The material may be crusher run or screened and recombined.

1.3.1.2 Dense Graded Materials

Designation: Unbound crushed rock materials are designated as follows:

DGB20: 20mm nominal sized densely graded base.

DGS20: 20mm nominal sized densely graded subbase.

DGS40: 40mm nominal sized densely graded subbase.

1.3.1.3 Graded Macadam and Macadam material

Requirement: Graded Macadam and Macadam materials may only be used if specified or approved by the Authorised Person.

Designation: Graded Macadam and Macadam materials are designated as follows:

GMB20: 20mm nominal sized graded macadam base.

GMS40: 40mm nominal sized graded macadam subbase.

1.3.1.4 Recycled material

General: Recycled building material used as granular base and subbase material shall primarily consist of crushed concrete or recycled pavement material. Recycled or manufactured materials may be blended with virgin materials or with other recycled materials to meet the requirements of this specification.

Requirement: Conform to the maximum proportion of recycled materials in the **Recycled constituent materials table**.

Designation: Recycled crushed concrete materials are designated as follows:

RCCB20: 20mm nominal sized recycled crushed concrete base.

RCCS20: 20mm nominal sized recycled crushed concrete subbase.

Table 4-3 Recycled constituent materials table

| Recycled Material | Maximum material proportion (% by mass) |
|--|---|
| Recycled crushed concrete(i) | 100 |
| Reclaimed asphalt pavement (RAP) | 40 |
| Clay brick tile, crushed rock, masonry | 20 |
| Crushed glass fines(ii) | 10 |

Notes

- i. Pavement materials with more than 30% percentages of recycled crushed concrete must not be used within 100mm of the underside of bituminous seals or asphalt with total thickness less than 150mm, due to the potential for available cement which may rehydrate and result in shrinkage cracking.
- ii. Crushed glass fines refer to clean crushed glass which has been processed to produce an approved aggregate. Unprocessed glass is considered to be a contaminant.

Contaminants: Make adequate provisions to ensure that materials do not exhibit expansive reactions resulting from the presence of free Calcium Oxide, Magnesium Oxide or other expansive materials. Contaminant levels shall be limited and conform to the **RCCB contaminants table**.

Table 4-4 RCCB contaminants table

| Test method | Description | Recycled base material | Recycled subbase material |
|---------------------------|--|------------------------|---------------------------|
| Direct measurement | Foreign materials within fraction retained on 4.75 mm sieve - % by mass: | | |
| | High density (brick, etc) | max 2.0 | max 3.0 |
| | Low density (plaster, etc) | max 0.5 | max 0.5 |
| | Organic matter (wood, etc) | max 0.2 | max 0.2 |
| | Asbestos and hazardous materials | 0 | 0 |
| RMS T134 | Free lime content | max 0.6% | max 0.6% |

1.3.1.5 Base material properties

Base materials: Conform to the **Base material properties table** both prior to and after placement in the pavement. Material requirements apply after pre-treatment of materials, if applicable.

Pre-treatment: To *RMS test method T102* unless pre-treatment test exemption provided by the Principal.

Table 4-5 Base material properties table

| Test method | Description | DGB20 | GMB20 | RCCB20 |
|----------------------|--|------------|-----------|--------------|
| AS 1289.3.6.1 | Particle size distribution | | | |
| | % passing 26.5 mm sieve | 100 | 100 | 100 |
| | % passing 19.0 mm sieve | 95–100 | 95–100 | 95–100 |
| | % passing 13.2 mm sieve | 78–92 | 50–70 | 78–92 |
| | % passing 9.5 mm sieve | 63–83 | 30–55 | 63–83 |
| | % passing 4.75 mm sieve | 44–64 | – | 44–64 |
| | % passing 2.36 mm sieve | 33–49 | 20–30 | 30–48 |
| | % passing 425 µm sieve | 14–23 | 6–15 | 13–21 |
| | % passing 75 µm sieve | 7–14 | 2–8 | 5–9 |
| | % passing 13.5 µm sieve(i) | 3–7 | – | |
| | Retained between sieves | | | |
| | % retained 19.0–13.2 mm | 6–18 | | |
| | % retained 13.2–9.5 mm | 7–17 | | |
| | % retained 9.5–4.75 mm | 13–25 | | |
| | % retained 4.75–2.36 mm | 7–19 | | |
| | % retained 2.36–0.425 mm | 14–30 | | |
| | % retained 425–75 µm | 6–13 | | |
| | % retained 75–13.5 µm | 3–8 | | |
| AS 1289.3.1.1 | Liquid limit (if non-plastic) | max 23 | max 23 | max 27 |
| RMS T109 | Plastic limit (if plastic) | max 20 | max 20 | |
| AS 1289.3.3.1 | Plasticity index: (ii) | | | |
| | Traffic category | | | |
| | Rear lanes | max 8 | max 8 | max 8 |
| | All other streets | 2–6 | max 8 | 2–6 |
| AS 1141.52 | Maximum dry compressive strength on fraction passing 19 mm sieve (only applies if PI < 2) | min 1.7MPa | – | min 1.7MPa |
| AS 1141.14 | Particle shape by proportional calliper - % misshapen (2:1) | max 35% | max 35% | max 35% |
| AS 1141.22 | Aggregate wet strength(iii) | min 70kN | min 130kN | min 70kN(iv) |
| AS 1141.22 | Wet/dry strength variation(iii) (dry - wet)/dry | max 35% | max 30% | max 35%(iv) |
| AS 5101.4 | Unconfined compressive strength (UCS) (only applies to DGB20 if fly ash is incorporated or the material is | max 1.0MPa | – | max 1.0MPa |

| Test method | Description | DGB20 | GMB20 | RCCB20 |
|----------------------|--|----------|----------|----------|
| | modified) | | | |
| RMS T239 | Two or more fractured faces (%) (v) | min 75 | min 85 | |
| AS 1141.36 | Total sulphur content (% S by mass) | max 0.05 | max 0.05 | max 0.05 |
| AS 1289.4.2.1 | Water soluble sulphate content (% SO ₄ by mass) | max 0.10 | max 0.10 | max 0.10 |

Notes

- i. Filler (material passing 75µm sieve) may be incorporated into the material to improve its particle size distribution and cohesion and/or to reduce its permeability. Submit to the Authorised Person details of the proposed source and the amount and type of filler prior to use. The filler is to be uniformly mixed through the coarse aggregate by use of a pugmill or alternative mixing system approved by the Authorised Person. Determination of “% passing 13.5µm sieve” is not required for materials containing 5% or more by mass of fly ash.
- ii. The plasticity index may be reduced to zero for materials containing 5% or more by mass of fly ash or when the material is to be bound. Where fillers other than fly ash are proposed and sufficient data is available to demonstrate adequate workability of the proposed mix, the Authorised Person may also permit a reduction to the plasticity index.
- iii. Test the fraction 19.0 mm to 9.5 mm. In the case of blended materials, also test the fraction 9.5 mm to 4.75 mm. Test any other fraction which is at risk of failing, in the opinion of the Authorised Person.
- iv. For RCCB20, where sufficient data is provided to demonstrate acceptable performance, the Authorised Person may allow lower Aggregate wet strength and higher Wet/dry strength variation limits.
- v. Material that has been drilled, blasted and crushed is exempt from this requirement.

1.3.1.6 Subbase material properties

Subbase materials: Conform to the **Subbase material properties table**. Material requirements apply after pre-treatment of materials, if applicable.

Pre-treatment: To *RMS test method T102* unless pre-treatment test exemption provided by the Principal.

Trench backfill: Subbase for use as trench backfill under roads shall conform to the **Subbase material properties table**.

Table 4-6 Subbase material properties table

| Test method | Description | DGS20 | DGS40 | GMS40 | RCCS20 |
|----------------------|----------------------------|--------|--------|-------|--------|
| AS 1289.3.6.1 | Particle size distribution | | | | |
| | % passing 53.0 mm sieve | — | 100 | 100 | — |
| | % passing 37.5 mm sieve | — | 95–100 | — | — |
| | % passing 26.5 mm sieve | 100 | 75–95 | — | 100 |
| | % passing 19.0 mm sieve | 95–100 | 64–90 | 50–75 | 95–100 |
| | % passing 13.2 mm sieve | 70–90 | — | — | 75–95 |
| | % passing 9.5 mm sieve | 58–80 | 42–78 | 15–35 | 60–90 |
| | % passing 4.75 mm sieve | 43–65 | 27–64 | —5–15 | 42–76 |
| | % passing 2.36 mm sieve | 30–55 | 20–50 | 1–8 | 28–60 |
| | % passing 0.425 mm sieve | 10–30 | 10–23 | 0–4 | 10–28 |
| | % passing 0.075 mm sieve | 4–17 | 4–12 | — | 2–10 |
| | % passing 13.5 µm sieve(i) | 2-10 | 2-7 | | |

| Test method | Description | DGS20 | DGS40 | GMS40 | RCCS20 |
|----------------------|---|------------------|------------------|------------------|------------------|
| AS 1289.3.1.1 | Liquid limit (if non-plastic) | max23 | max 23 | — | max 27 |
| RMS T109 | Plastic limit (if plastic) | max 20 | max 20 | | |
| AS 1289.3.3.1 | Plasticity index: Traffic category Rear lanes All other streets | max 12 max 10 | max 12 max 10 | max 10 max 10 | max 12 max 15 |
| AS 1141.52 | Maximum dry compressive strength on fraction passing 19 mm sieve (only applies if PI<2) | min 1.0 MPa | min 1.0 MPa | — | min 1.0 MPa |
| AS 1141.14 | Particle shape by proportional calliper - % misshapen (2:1) | max 35% | max 35% | max 35% | max 35% |
| AS 1141.22 | Aggregate wet strength(iii) | min 50 kN | min 50 kN | min 130 kN | min 50 kN |
| AS 1141.22 | Wet/dry strength variation(iii) (dry - wet)/dry | max 40% | max 40% | max 30% | max 40%(iv) |
| AS 1289.5.1.1 | 4 day soaked CBR (98% standard compaction) | — | — | min 30% | — |
| RMS T239 | Two or more fractured faces %(v) | min 75 | min 85 | min 75 | |
| AS 1141.36 | Total sulphur content (% S by mass) | max 0.05 | max 0.05 | max 0.05 | max 0.05 |
| AS 1289.4.2.1 | Water soluble sulphate content (% SO4 by mass) | max 0.10 | max 0.10 | max 0.10 | max 0.10 |

Notes

- i. Filler (material passing 75µm sieve) may be incorporated into the material to improve its particle size distribution and cohesion and/or to reduce its permeability. Submit to the Authorised Person details of the proposed source and the amount and type of filler prior to use. The filler is to be uniformly mixed through the coarse aggregate by use of a pugmill or alternative mixing system approved by the Authorised Person. Determination of “% passing 13.5µm sieve” is not required for materials containing 5% or more by mass of fly ash.
- ii. The plasticity index may be reduced to zero for materials containing 5% or more by mass of fly ash or when the material is to be bound. Where fillers other than fly ash are proposed and sufficient data is available to demonstrate adequate workability of the proposed mix, the Authorised Person may also permit a reduction to the plasticity index.
- iii. Test the fraction 19.0mm to 9.5mm. In the case of blended materials, also test the fraction 9.5mm to 4.75mm. Test any other fraction which is at risk of failing, in the opinion of the Authorised Person.
- iv. For RCCS40, where sufficient data is provided to demonstrate acceptable performance, the Authorised Person may allow lower Aggregate wet strength and higher Wet/dry strength variation limits.
- v. Material that has been drilled, blasted and crushed is exempt from this requirement.

1.3.2 Modified Texas triaxial classification

1.3.2.1 Alternative materials

Add additional conformance criteria based on RMS grading and material specification.

Requirement: Submit proposal for the use of any unbound base or subbase material that conforms to the requirements of the Base material properties table and the Subbase material properties table, except for:

- > Particle size distribution grading to *AS 1289.3.6.1*; or
- > Particle shape by proportional calliper to *AS 1141.14*, or
- > Two or more fractured faces to *RMS test method T239*.

Proposed material: Submit details of the proposed material (after pre-treatment as required for base or subbase as applicable) including the following:

- > Acceptable compaction characteristics and field performance.
- > Modified Texas triaxial classification and associated tests.
- > Maximum permitted deviation from the nominated particle size distribution.

This is a **HOLD POINT**.

Test Method: RMS test method T171.

Requirements: **To the Modified Texas triaxial classification number requirements table.**

RMS test method T171 tested: At 83 - 87% of Optimum Moisture Content and 99 – 101% of Maximum Dry Density as determined by *AS 1289.5.1.1*.

Table 4-7 Modified Texas triaxial classification number requirements table

| Material class | Modified Texas triaxial classification number (RMS test method T171) |
|-------------------|---|
| Base | |
| Rear lanes | max 2.5 |
| All other streets | max 2.2 |
| Subbase | max 3.2 |

1.3.2.2 Deviation from nominated particle size distribution grading

Requirements: To the **Maximum deviation of particle grading table**.

Table 4-8 Maximum deviation of particle grading table

| Test method | Description | DGB20 | DGS20 | DGS40 |
|----------------------|---|-------|-------|-------|
| AS 1289.3.6.1 | Maximum deviation from particle size distribution | | | |
| | % passing 53.0 mm sieve | - | - | - |
| | % passing 37.5 mm sieve | - | - | ±0 |
| | % passing 26.5 mm sieve | ±0 | ±0 | ±8 |
| | % passing 19.0 mm sieve | ±3 | ±3 | ±8 |
| | % passing 13.2 mm sieve | ±7 | ±8 | - |
| | % passing 9.5 mm sieve | ±6 | ±6 | ±8 |
| | % passing 4.75 mm sieve | ±6 | ±6 | ±6 |
| | % passing 2.36 mm sieve | ±6 | ±6 | ±6 |
| | % passing 0.425 mm sieve | ±4 | ±4 | ±4 |
| | % passing 0.075 mm sieve | ±2 | ±2 | ±2 |

1.3.3 Lime modified base and subbase materials

1.3.3.1 Lime modification

Proposal: Submit details of any proposed addition of hydrated lime, including details of initial consumption of lime in accordance with *RMS test method T144*, to modify unbound base and subbase materials to meet the requirements of **Unbound base and subbase materials**.

This is a **HOLD POINT**.

Modification: Uniformly mix with hydrated lime, in a stationary mixing plant, at the supplier's quarry.

1.3.3.2 In-situ lime modification

Alternative: Submit details of any proposed in-situ addition of hydrated lime or quicklime, including details of initial consumption of lime in accordance with *RMS test method T144*.

This is a **HOLD POINT**.

Method: To *RMS R75*.

1.3.4 Bound base and subbase materials

1.3.4.1 General

Specification: To *TRITS 04 Flexible pavement construction*.

Alternative: In-situ stabilisation in accordance with *RMS R75* may only be used to Other materials

1.3.4.2 Water

Requirement: Water for use in the Works must be free from deleterious amounts of materials such as oils, salts, acids, alkalis and vegetable substances. Water taken from any source other than an ICON Water supply system must conform to the **Water quality table**.

Table 4-9 Water quality table

| Test method | Description | Maximum level |
|------------------|--|-----------------|
| RMS T1004 | Chloride ion | 600 ppm |
| RMS R1014 | Sulphate ion | 400 ppm |
| AS 3550.4 | Undissolved solids | 1% by mass |
| RMS T1015 | Thermo-tolerant coliforms (Recycled water) | 1,000 per 100mL |

1.4 Execution

1.4.1 Site establishment

Survey: Confirm site surface and benchmarks. Conform to *MITS 00 Preliminaries*.

Registration and insurance: Conform to *MITS 00 Preliminaries*.

Operation: Conform to *EPA requirements*.

1.4.2 Provision for traffic

1.4.2.1 General

Requirement: Conform to *MITS 01 Traffic Management*.

1.4.3 Delivery

1.4.3.1 Transport of materials

Delivery vehicles: Provide enclosure to avoid loss of material during transit.

Condition: Provide materials sufficiently damp to avoid segregation and loss of fines during transit.

Moisture content: Uniformly distributed so that the moisture content on the day of use is less than the optimum moisture content to *AS 1289.5.1.1*, *AS 1289.5.7.1* or the moisture content as specified by the Authorised Person $\pm 0.5\%$.

1.4.3.2 Delivered materials

Notice: Give notice of arrival of materials for inspection.

This is a **WITNESS POINT**.

1.4.3.3 Delivery of modified materials

Time period: Program the delay between mixing and delivery of batched materials, to allow incorporation into the works, including trimming and compaction, within the nominated field working period.

Vehicle covers: Use delivery vehicles fitted with fabric covers to prevent loss of moisture during transport.

1.4.3.4 Delivery dockets for bound material

Identification: Identify each truck load of bound material by delivery dockets, indicating the time and date of mixing and registration or fleet number of the delivery truck. Provide delivery dockets for inspection at the point of delivery.

1.4.4 Stockpiling unbound material

1.4.4.1 Location

Stockpile sites: Locate stockpile sites as shown on the Drawings or give notice of proposed alternative locations.

This is a **WITNESS POINT**.

Multiple sources: If materials of different types or from different sources are delivered to site, they shall be placed in separate stockpiles.

1.4.4.2 Preparation

Condition: Clear stockpile sites of all vegetation and extraneous matter, and shape to form a crown to allow area to drain freely. Compact the area to a relative compaction $\geq 95\%$, to AS 1289.5.4.1 for standard compactive effort.

1.4.4.3 Stockpile maintenance

Stockpile dimensions: Constructed with slopes no greater than 2:1 for heights up to 2.5m. Where stockpiles are greater than 2.5m in height, slopes may be reduced to 1:1 subject to the contractors work methods and site safety considerations.

Moisture content: Maintain stockpiled material at a moisture content sufficient to avoid loss of fines.

Contamination of materials: Maintain stockpiles and stockpile sites to make sure materials do not become intermixed, segregated or contaminated with foreign material.

1.4.4.4 Restoration

Surplus material: Upon completion of the works, clear stockpile sites of all surplus material and leave in a clean and tidy condition.

1.4.4.5 Sampling

Test: Sample and test stockpiles within 3 days of delivery to AS 1141.3.1 and as directed by the Authorised Person.

This is a **WITNESS POINT**.

1.4.5 Spreading

1.4.5.1 General

Process: Spread in uniform layers as near as practicable to the required thickness by direct tipping from suitable vehicles or by the use of a mechanical spreader. If material becomes segregated it shall be remixed to produce a consistent material.

Multiple sources: If materials from different sources are delivered to site, they shall be placed in separate lots.

Transverse joints: Locate at a minimum offset of 2m from any joint in layer below.

Longitudinal joints: Locate along lane marking line or mid-way between lane marking lines. Offset a minimum of 100mm from any joint in layer below.

Moisture content when spreading: 60-90% of the laboratory optimum moisture content as determined by AS 1289.5.1.1.

1.4.5.2 Underlying layer

Requirement: Moisture content $< 80\%$ of the laboratory optimum moisture content, to AS 1289.5.1.1, and free from rutting or foreign matter.

Quality: Before spreading of base and subbase material, give notice so that inspection may be made of the underlying layer quality including the assessment of required moisture content.

This is a **HOLD POINT**.

1.4.5.3 Non-conforming underlying layer

Correction: If Contractor activities cause the underlying layer to become non-conforming, correct the underlying layer to conform to this Specification. If the layer is materially different to when it was approved (e.g. due to rain) then the contractor shall re-test and demonstrate conformance with this Specification at no cost to the Principal.

1.4.6 Trimming, compaction and curing

1.4.6.1 Compaction

Process: Spread, shape and compact each layer in uniform thicknesses. Trim layer to conform to the documented thickness.

Compacted layer thickness 100mm minimum. Maximum layer thickness shall be limited to that which will allow compaction to specified densities by the equipment available or 200mm, whichever is smaller. A maximum layer thickness greater than 200mm may be approved by the Authorised Person prior to use and the Authorised Person may require that the layer be tested for compaction density in two sub-layers. Provide layers of equal thickness in multilayer courses. Give notice of the proposed use of any layer thickness outside of this range.

This is a **WITNESS POINT**.

1.4.6.2 Compaction procedure

Conformance: Uniformly compact each layer of the base and subbase courses over their entire area and depth conforming to **Acceptance of compaction**.

Moisture content: Maintain within 60-90% of the optimum moisture content during compaction.

One-way cross fall sections: Compact from the low side to the high side.

Crowned sections: Compact from edge to crown on each side of the pavement.

Rollers: Pass parallel to the centreline of the pavement and uniformly overlap each preceding pass.

1.4.6.3 Plant

Watering equipment: Use water spraying equipment that is capable of uniformly distributing water in controlled quantities and in uniform widths.

Protection: Do not stand watering and compaction plant on the pavement being compacted.

Self propelled plant: Use self propelled compaction plant, where practical.

1.4.6.4 Trimming

Process: Surfaces of base materials shall be constructed higher than the specified levels and cut to profile by power grader or trimming machine towards the end of the compaction process. Rolling shall then continue until the specified density is achieved.

Cuttings: Cuttings from the trimmed surface may be used to a maximum depth of 50mm in the bottom of adjoining layers of base material subject to non-contamination by other materials.

1.4.6.5 Rework

Wetted up layers: If an unbound layer becomes wetted up after compaction is complete, dry out and give notice for inspection. If necessary, uniformly re-compact and trim to the documented density requirements and level tolerances.

Inspection: **WITNESS POINT**.

1.4.6.6 Subsequent layers

Tests: Do not place subsequent layers until all required testing has been completed and the test results for each layer have been submitted.

This is a **HOLD POINT**.

1.4.6.7 Unstable areas

Rejection criteria: Any unstable areas that develop during rolling or are identified by proof rolling.

Dry back and replacement: Open up, dry back and re-compact, to the requirements of this Specification. Alternatively, remove the full depth of layer, dispose of and replace with fresh material to conform to Removal and replacement of rejected courses.

1.4.6.8 Matching to existing

Process: Unless otherwise specified, where pavement is to be joined to an existing pavement, remove a strip of the existing pavement minimum width 300mm for its full depth. Trim the edge to approximately 45° in steps of maximum height 150mm. Trim the bituminous surface to a neat edge using a saw cut, pneumatic tool or equivalent.

1.4.7 Acceptance of compaction

1.4.7.1 Lots for acceptance

Acceptance of work: Based on density testing of the work in lots.

Density testing: Submit results verifying the required relative compaction has been achieved.

This is a **HOLD POINT**.

1.4.7.2 Compaction requirements and acceptance

Lot compaction acceptance: Minimum relative compaction for standard compactive effort is $\geq 102\%$.

Alternative compaction acceptance: Zones with relative compaction $< 102\%$ (standard compactive effort) but $\geq 100\%$ may be accepted provided evidence is submitted to show that such zones constitute less than 5% of the lot.

This is a **HOLD POINT**.

Moisture content of unbound or modified material: All zones shall have a moisture content in the range of 60-90% of the optimum moisture content as determined by *AS1286.5.1.1* when tested for compaction.

1.4.7.3 Relative compaction using in-situ dry density

Method: Calculate the relative compaction of pavement material, at each location tested for in-situ dry density, to AS 1289.5.4.1 as follows:

- > Relative Compaction % = [(In-situ dry density)/(Comparative dry density)] x 100.

Comparative dry density: Equal to the following:

- > Unbound layers: The maximum dry density (standard compactive effort) determined in the laboratory by testing samples to AS 1289.5.1.1. The location of the sample for determining the maximum dry density must be the same as for the in-situ density.
- > Bound layers: The maximum dry density (modified compactive effort) determined by testing samples to *RMS test method T130* within two hours of the addition of the stabilising agent to the mix.

In-situ dry density: Test the compacted material to AS 1289.5.3.2 or AS 1289.5.8.1.

1.4.7.4 Proof rolling

The Authorised Person may require the Contractor to perform proof-rolling to demonstrate compaction.

1.4.7.5 Corrective action – Rejected layers

Non-conformance report: All nonconforming layers shall be the subject of a non-conformance report.

General: Work may only proceed above the nonconforming layer subject to the approval of the Authorised Person.

Unbound layers: Rework lots that have been rejected in regard to compaction and resubmit for compaction assessment. If the moisture content is nonconforming, correct as necessary. Unless otherwise permitted, mix mechanically for the full depth of the layer to uniformly distribute moisture prior to rolling.

Bound layers: Remove rejected bound layers.

1.4.7.6 Removal

Replacement: Remove rejected bound layers and any unbound material which in the opinion of the Authorised Person, has become degraded, segregated or otherwise reduced in quality by reworking. Dispose of and replace with fresh material to conform to **Removal and replacement of rejected courses**.

1.4.8 Acceptance of Dimensions and Levels

1.4.8.1 General

Acceptable limits: Conform to the **Pavement dimension and level tolerance table** for acceptable limits of departure from the dimensions shown on the drawings, which may occur during construction.

Lots: Conform to the maximum lot size and minimum test frequencies in *MITS 00B Quality Construction*. Each pavement layer is to be surveyed for level and thickness conformance.

Survey reports: Submit survey reports covering line and level for each lot.

This is a **HOLD POINT**.

Table 4-10 Pavement dimension and level tolerance table

| Pavement | Criteria | Tolerance | |
|---|---------------|--------------------------------|--|
| Base | Surface level | ± 5mm + 10mm - 0mm ± 5mm | if immediately adjacent to gutter if not immediately adjacent to gutter from a 3m straight edge laid in any direction measured after trimming and immediately prior to sealing |
| | Thickness | + 20mm - 0mm + 30mm - 10mm | if automatic level control used if automatic level control not used |
| Subbase | Surface level | + 10mm - 25mm | measured after trimming |
| | Thickness | ±10 mm | measured after trimming |
| Total pavement layers above subgrade | Thickness | - 10 mm | |

1.4.8.2 Layer width

Tolerance: Zero to + 100mm of the design widths for both base and subbase, measured from the design centre line to the edge of the constructed pavement base/subbase layer but limited to 50mm per side and as shown on the drawings. Give notice for inspection of completed layer width.

This is a **WITNESS POINT**.

1.4.8.3 Surface level

Surface: Parallel to the proposed finished wearing surface after final compaction and trimming of both base and subbase layers. The surface shape shall be such that water cannot accumulate at any point.

1.4.8.4 Subbase surface deviation

Surface: From design level, after trimming. Give notice for inspection of completed subbase surface.

This is a **WITNESS POINT**.

1.4.8.5 Base surface deviation

Surface: From design level or from a 3m long straight edge laid in any direction, after trimming and immediately prior to sealing. Additionally, there must be no abrupt change of levels in the transition from the pavement to fixed structures such as a bridge deck. Give notice for inspection of completed base surface.

Inspection: **WITNESS POINT**.

1.4.8.6 Base adjacent to kerb and gutter

Surface: From the level of the lip of the gutter, minus the design thickness of the wearing surface. Give notice for inspection of completed base surface.

This is a **WITNESS POINT**.

1.4.8.7 Corrective action – Rejected unbound layers

Non-conformance report: All nonconforming layers shall be the subject of a non-conformance report.

Trimming: Submit proposal to correct surface by trimming without filling, to produce a uniform, hard surface.

This is a **HOLD POINT**.

1.4.8.8 Removal

Replacement: If corrective action is unachievable, remove and dispose of material and replace with fresh material to conform to **Removal and replacement of rejected courses**.

1.4.9 Removal and replacement of rejected courses

1.4.9.1 Extent of removal

Requirement: Remove rejected material over full length of rejected lot.

Exception: Submit proposal to remove less than the full width, as constructed, if the cause of rejection can be isolated. Form a new longitudinal cold joint located along the centreline of the road pavement. This is a **HOLD POINT**.

1.4.9.2 Prior to replacement

Inspection: Give notice of completion of removal of rejected base or subbase, for inspection before commencement of replacement works.

This is a **HOLD POINT**.

1.4.9.3 Replacement

Materials: Provide materials for replacement works, including spreading, compaction, trimming, curing and test the replacement materials, to conform to the requirements of this Specification.

Damage: Submit proposed methods to make good any damage to underlying or abutting layers or structures due to the removal or replacement of rejected courses.

This is a **HOLD POINT**.

1.4.10 Maintenance before completion of wearing surface

1.4.10.1 Dry back

General: Allow material to dry back to 60% to 80% of the optimum moisture content before applying the prime, primerseal or wearing surface

1.4.10.2 Primer or Primerseal

Prepared surface: Maintain the accepted condition of the base course until the wearing surface is completed.

Extent: Within 7 days of acceptance of a lot, cover the base course with a prime or primerseal, over the full width, to **Sprayed bituminous surfacing** or **Asphalt**. Give notice of any alternative procedure proposed.

This is a **WITNESS POINT**.

1.4.10.3 Pavement condition before primer or primerseal

Restore condition: If the base condition deteriorates before prime or primerseal application and approval to proceed with bitumen surfacing work is withdrawn, dry-back and reprepare the base. Submit evidence of dry-back being achieved and give notice for inspection.

This is a **HOLD POINT**.

1.4.10.4 Surface drainage

Ponded water: Maintain adequate drainage of the pavement before completion of the wearing surface and remove any ponded water within 12 hours if free drainage is not achievable.

1.4.10.5 Restrictions on movement

Limits: Only vehicles registered for road use and loaded within legal limits are permitted to use the pavement.

Bound pavements: Prevent construction plant and vehicles not involved in current construction or testing activities from using the pavement within 7 days of placement of the base course and before the application of prime or primerseal.

Unbound pavements: Prevent construction plant and vehicles not involved in current construction or testing activities from using the pavement before the application of primerseal. Give notice if this requirement is impractical.

This is a **WITNESS POINT**.

1.4.10.6 Opening bound pavement to traffic

Timing: Traffic not permitted to use pavement within 7 days of completion of full pavement depth and application of prime or primerseal. Give notice of proposed opening to traffic.

This is a **HOLD POINT**.

1.5 Completion

1.5.1 Submissions

Work as Executed Records: To *MITS 00B Quality Requirements*.

2 SPRAYED BITUMINOUS SURFACING

2.1 General

Precedence: In many areas of road infrastructure construction and management, the ACT has adopted the relevant specifications of the NSW Roads and Maritime Services. The relevant RMS documents are identified and referenced in these specifications. The works must be carried out according to the referenced RMS specifications with the exception of items detailed in this Specification. Where any differences in practice exist between the RMS Specifications and this Specification, the latter will prevail.

2.1.1 Scope

Sprayed Bituminous Surfacing (with cutback bitumen): To *RMS R106 Sprayed Bituminous Surfacing (with cutback bitumen)*.

Sprayed Bituminous Surfacing (with polymer modified bitumen): To *RMS R107 Sprayed Bituminous Surfacing (with polymer modified bitumen)*.

Bituminous slurry surfacing: To *RMS R109 Bituminous slurry surfacing*.

Sprayed Bituminous Surfacing (with emulsified bitumen): To *RMS R111 Sprayed Bituminous Surfacing (with emulsified bitumen)*.

Cover Aggregate for Bituminous Surfacing : To *RMS D&C 3151 Cover Aggregate for Bituminous Surfacing*.

2.2 Materials

Aggregates for sealing purposes: The PAV for all aggregate shall not be less than 48.

2.3 Execution

General: Section 9 of R106, R107 and R111, shall include 5mm and 7mm aggregates in stone removal requirements.

The removal of loose stones is a **WITNESS POINT**.

Warning signage: Areas where speed limits exceed 60 km/h and that are opened to traffic prior to final sweeping must have temporary speed zone 'loose stones' and 'slippery' warning signs and temporary 60 km/h speed zoning in place until the maximum allowable loose aggregate requirement is met.

2.4 Completion

2.4.1 Submissions

Work as Executed Records: To *MITS 00B Quality Requirements*.

3 ASPHALT

3.1 General

Precedence: In many areas of road infrastructure construction and management, the ACT has adopted the relevant specifications of the NSW Roads and Maritime Services. The relevant RMS documents are identified and referenced in these specifications. The works must be carried out according to the referenced RMS specifications with the exception of items detailed in this Specification. Where any differences in practice exist between the RMS Specifications and this Specification, the latter will prevail.

3.1.1 Scope

Light Duty Dense Graded Asphalt: To *RMS R117 Light Duty Dense Graded Asphalt*. Municipal Roads with a traffic volumes less than 10⁷ ESA shall only be constructed with Light Duty Dense Graded Asphalt.

Recycled Asphalt Pavements (RAP) To *RMS 3153 Reclaimed Asphalt Pavement Material*.

Stone Mastic Asphalt: To *RMS R121 Stone Mastic Asphalt*.

Thin Open Graded Asphalt Surfacing (TOGAS): To *RMS R123 Thin Open Graded Asphalt Surfacing*.

Heavy Duty Dense Graded Asphalt: To ACT edited *RMS R116 Heavy Duty Dense Graded Asphalt*.

Open Graded Asphalt: To *RMS R119 Open Graded Asphalt*.

Coloured surface coatings for bus lanes and cycle ways: To *RMS R110 Coloured surface coatings for bus lanes and cycle ways*.

Crumbed Rubber Asphalt: To *RMS R118 Crumbed Rubber Asphalt*.

Crack Sealing: To *RMS M211 Crack Sealing Bituminous Surfaces*.

3.2 Materials

General: Unless otherwise specified all binder shall be AR450, aggregate shall have a PAV not less than 48 and wet strength shall be 150 kN or greater.

RAP: RAP is not permitted for use in Stone Mastic Asphalt (SMA) or Thin Open Graded Asphalt Surfacing (TOGAS) mixes.

SMA: SMA must contain a minimum of 0.3% by mass of cellulose or acrylic fibre.

3.3 Completion

3.3.1 Submissions

Work as Executed Records: To *MITS 00B Quality Requirements*.

4 MEASUREMENT AND PAYMENT

4.1 Measurement

4.1.1.1 General

Payments made to the Bill of Quantities: To *MIT S 00 Preliminaries*, this Specification, the drawings and **Pay items**.

Scope: Measurement for payment will include all works shown on the plans or as specified but will not include asphalt lost in transit, works not shown on the plans and variations in quantities due to variations in actual thickness exceeding the specified tolerances.

4.1.1.2 Methodology

The following methodology will be applied for measurement and payment:

- > Allow for all work, materials, testing and quality assurance requirements in each Pay Item.
- > Excavation and preparation of subgrade: *MIT S 02 Earthworks*.
- > Kerb and gutter: To *MIT S 06 Concrete kerbs, footpaths and minor works*.
- > Miscellaneous minor concrete work not included in the pay items in this Specification: To *MIT S 06 Concrete kerbs, footpaths and minor works*.

4.2 Pay items

Table 4-11 Pay Items table

| Item No | Pay items | Unit of measurement | Schedule of rates scope |
|---------|------------------|--|---|
| 4.1 | Base material | m ² The area is determined by the area of work as measured by survey and specified on the drawings or as directed by the Authorised Person. A separate pay item shall be allowed for each total relevant thickness shown on the drawings. | This pay item shall include supply, spreading, compaction and trimming of base material at the specified moisture content. Take no account of allowable tolerances. |
| 4.2 | Subbase material | m ² The area is determined by the area of work as measured by survey and specified on the drawings or as directed by the Authorised Person. A separate pay item shall be allowed for each total relevant thickness shown on the drawings. | This pay item shall include supply, spreading, compaction and trimming of subbase material at the specified moisture content. Take no account of allowable tolerances. |

| Item No | Pay items | Unit of measurement | Schedule of rates scope |
|---------|---------------------------------------|---|---|
| 4.3 | Match to Existing Pavement | linear metre constructed | <p>This pay item shall include all works associated with matching granular pavement layers to the existing pavement as described in Trimming, Compaction and Curing or as shown on the drawings. This includes excavation and removal of the existing pavement, compaction, and trimming.</p> <p>The pay item shall also include all plant, equipment, labour, supervision, material, transport, milling and sawing or cutting costs and for all incidentals for milling, cutting or sawing the asphalt/pavement layers in accordance with the drawings, complete.</p> <p>Payment will not distinguish between various depths of sawing or cutting work or pavement materials, irrespective of the number of separate cuts which may be required for sawing or cutting the layer to the required depth.</p> |
| 4.4 | Supply and Spray Primer, Primerbinder | litres measured at 15°C The quantities shall be determined by multiplying the target application rate of the combined mixture of all materials (including any field or refinery incorporated cutter or flux) by the area of road surface sprayed for each sprayer run. | <p>This pay item shall include preparation of the surface to be sprayed including brooming where required, and supply, heating and spraying of primer and primerbinder.</p> <p>A separate pay item shall be included in the Contract for each type of primer and primerbinder. For example;</p> <ul style="list-style-type: none"> 4.4.1 AMCO0 4.4.2 AMCO 4.4.3 Field cutback primer/primerbinder etc |
| 4.5 | Supply and Spray Binder | litres measured at 15°C The quantities shall be determined by multiplying the target application rate of binder by the area of road surface sprayed for each sprayer run. Measurement shall include bitumen used for tack coats as specified. | <p>This pay item shall include preparation of the surface to be sprayed including brooming where required, adhesion agent where specified and supply, heating and spraying of bitumen.</p> <p>A separate pay item shall be included in the Contract for each type of binder. For example;</p> <ul style="list-style-type: none"> 4.5.1 Class 240 4.5.2 Class 450 etc |

| Item No | Pay items | Unit of measurement | Schedule of rates scope |
|---------|--|--|--|
| 4.6 | Supply, incorporate and spray cutter oil in binder | litres measured at 15 C The quantities shall be determined by multiplying the target application rate by the area of road surface sprayed for each sprayer run. | This pay item shall include incorporation and mixing into a homogeneous blend of cutback bitumen. |
| 4.7 | Supply, incorporate and spray fulx oil in binder | litres measured at 15 C The quantities shall be determined by multiplying the target application rate by the area of road surface sprayed for each sprayer run. | This pay item shall include incorporation and mixing into a homogeneous blend of cutback bitumen. |
| 4.8 | Supply, Precoat, Apply and Incorporate aggregate | m ³ The volume is determined by the area of work as measured by survey and specified on the drawings or as directed by the Authorised Person multiplied by the relevant design thickness shown on the drawings. | This pay item shall include the supply, stockpiling as appropriate, precoating, spreading, rolling into the binder of precoated aggregate and removal of excess aggregate where appropriate. A separate shall be included in the Contract for each nominal size of aggregate precoated as specified. For example; 4.6.1 10mm aggregate (precoated) 4.6.2 14mm aggregate (precoated) |
| 4.9 | Asphalt | tonnes The weight is determined by the area of work as measured by survey and specified on the drawings or as directed by the Authorised Person multiplied by the relevant thickness shown on the drawings multiplied by a density of 2.4 tonnes per m ³ . | This pay item shall include all operations involved in the supply, spreading and compaction of the asphalt. A separate pay item shall be included in the Contract for each type of binder, nominal size of aggregate and application designation. For example; 4.7.1 AC-HD 10 Corrective Course 4.7.2 SMA 14 Wearing Course 4.7.3 FGG-A Wearing Course |
| 4.10 | Remove Existing Asphaltic Concrete Paving | m ² The area is determined by the area of work as measured by survey and specified on the drawings or as directed by the Authorised Person, regardless of depth. | This pay item includes the saw cutting of the AC paving irrespective of depth, removal of paving including underlying courses irrespective of depth and disposal of waste materials off site and payment of all fees for disposal to an approved landfill or recycling. |

| Item No | Pay items | Unit of measurement | Schedule of rates scope |
|---------|----------------------------------|--|--|
| 4.11 | Mill Existing Pavement | m ² The area is determined by the area of work as measured by survey and specified on the drawings or as directed by the Authorised Person, regardless of depth. | This pay item shall include the milling of existing asphaltic concrete pavement and disposal of any waste materials off site including payment of all fees for disposal to an approved landfill or recycling facility. |
| 4.12 | Supply and lay geotextile fabric | m ² of geotextile material installed, not including overlaps required at joints | All activities associated with the construction of a geotextile liner including the supply and installation of the nominated liner material to manufacturer specification. A separate pay item shall be included in the Contract for each type of liner material. |



Transport Canberra and
City Services

July 2019