

TRANSPORT FOR NSW (TfNSW)

QA SPECIFICATION 3266

COLDMIX ASPHALT

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COLDMIX ASPHALT

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FOREWORD

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REVISIONS TO PREVIOUS VERSION

This document has been revised from Specification TfNSW 3266 Edition 5 Revision 0.

All revisions to the previous version (other than minor editorial and project specific changes) are indicated by a vertical line in the margin as shown here, except when it is a new edition and the text has been extensively rewritten.

PROJECT SPECIFIC CHANGES

Any project specific changes are indicated in the following manner:

- (a) Text which is additional to the base document and which is included in the Specification is shown in bold italics e.g. *Additional Text*.
- (b) Text which has been deleted from the base document and which is not included in the Specification is shown struck out e.g. ~~Deleted Text~~.

TfNSW QA SPECIFICATION 3266

COLDMIX ASPHALT

1 SCOPE

This Specification sets out the requirements for the supply and delivery of coldmix asphalt for use in road maintenance work.

The term “coldmix asphalt”, also referred to herein as “coldmix” or “mix”, also includes “dense graded coldmix” and “open graded coldmix”.

Details of the required types of coldmix asphalt and other coldmix asphalt requirements applicable to the work are shown in Annexure 3266/A.

2 STRUCTURE OF THE SPECIFICATION

This Specification includes a series of annexures that detail additional requirements.

2.1 PROJECT SPECIFIC REQUIREMENTS

Project specific requirements are shown in Annexure 3266/A.

2.2 SCHEDULES OF HOLD POINTS AND IDENTIFIED RECORDS

The schedules in Annexure 3266/C list the **HOLD POINTS** that must be observed. Refer to Specification TfNSW Q for the definition of **HOLD POINTS**.

The records listed in Annexure 3266/C are **Identified Records** for the purposes of TfNSW Q Annexure Q/E.

2.3 FREQUENCY OF TESTING

The minimum frequencies of testing are shown in Annexure 3266/L.

2.4 REFERENCED DOCUMENTS

Unless specified otherwise, the applicable issue of a referenced document, other than a TfNSW Specification, must be the issue current at the date one week before the closing date for tenders, or where no issue is current at that date, the most recent issue.

Standards, specifications and test methods are referred to in abbreviated form (e.g. AS 2350). For convenience, the full titles are given in Annexure 3266/M.

3 DEFINITIONS

The following definitions apply to this Specification.

Coldmix Asphalt	A mixture of bituminous binder and aggregate with or without added mineral filler produced warm or cold in a mixing plant and delivered in a workable condition suitable for stockpiling, and spreading and compaction.
Nominal Size	A designation of an aggregate which gives an indication of the largest size of particle size present.
Coarse Aggregate	Material having a nominal size of not less than 5 mm, i.e. usually material retained on a 4.75 AS sieve.
Fine Aggregate	Material having a nominal size of less than 5 mm, i.e. usually material passing a 4.75 mm sieve, and retained on a 0.075 mm sieve.
Workability	Ease with which the mix may be placed and compacted.

The term “the Supplier” means the supplier of the product covered by the scope of this Specification.

4 SUPPLIER’S QUALITY MANAGEMENT SYSTEM

The Supplier must establish and maintain a Quality Management System complying with AS/NZS ISO 9001 as a means of ensuring that the product conforms to this Specification.

Provide evidence verifying compliance with this Clause.

5 INFORMATION TO BE PROVIDED BY THE SUPPLIER

Each technical procedure must stipulate clearly, concisely and accurately those instructions which are necessary to carry out the particular operation or activity. Each Inspection and Test Plan must also be prepared to facilitate verification that the procedure complies with specified requirements and that the procedure is being implemented effectively.

The information to be provided by the Supplier must include, but not be limited to, the following:

- (a) Constituent Materials: Details for each nominated material (Clause 8);
- (b) Nominated Mix Design (Clause 8);
- (c) Test results of the properties of a trial batch of each nominated mix produced by the mixing plant from which the coldmix asphalt is to be supplied (Clause 8);
- (d) Details of the proposed methods of handling, storing and batching materials for coldmix asphalt together with details of proposed mixing equipment and mixing procedures (Clause 9.1).

6 MATERIAL REQUIREMENTS

6.1 AGGREGATE

Aggregates must be uniform in quality and particle size distribution. When aggregates are mixed with mineral filler and binder, the resultant coldmix asphalt must be capable of achieving the coldmix asphalt properties specified in Clause 7.

Produce aggregate from rock, gravel, metallurgical slag, or suitable synthetic material or from recycled material. The product must be clean, hard, durable, unaffected by an excess of flat or elongated particles, and manifestly devoid of dust, clay, dirt or other matter deleterious to coldmix asphalt.

When submitting nominated mix details in accordance with Clause 8, the Supplier must provide particle size distribution determined in accordance with AS 1141.11, to indicate the average particle size distribution of the aggregate, which must be known as “nominated aggregate particle size distribution”.

The Supplier must not use aggregates which deteriorate rapidly, either at the quarry face or in stockpiles, or can be shown to have an inadequate service life, even though apparently sound and complying with the specified requirements when quarried.

The aggregate must conform to the requirements as set out in Table 3266.1.

Table 3266.1 - Aggregate Properties

Property	Limit	Test Method
Wet Strength	100 kN minimum	AS 1141.22
Wet/Dry Strength Variation	35% maximum	AS 1141.22
Polished Aggregate Friction Value	44 # minimum	AS 1141.41
Particle Shape		AS 1141.14
- Calliper ratio 2:1	35% maximum	
- Calliper ratio 3:1	10% maximum	
Fractured Faces		TfNSW T239 *
- at least one fractured face	90% minimum	
- at least two fractured faces	75% minimum	

Note: # For surface course coldmix asphalt, the Polished Aggregate Friction Value must not be less than the value specified in Annexure 3266/A.

* Testing is carried out on aggregate retained on a 4.75 mm sieve.

6.2 FILLER

Filler is the material derived from aggregate or other added granular material passing a 75 µm AS Sieve.

Each type of filler from each source must be mineral material, dry, free from lumps, organic material or other deleterious material, and must comply with the requirements of AS 2357.

Not less than 50% of the filler must consist of flyash or other similar material, such as cement or powdered hydrated lime, approved by the Principal. If hydrated lime is approved for use in this application, the proportions must be:

- (a) for Dense Graded Coldmix: not less than 1.5%;
- (b) for Open Graded Coldmix: not less than 1.0%.

Hydrated lime must conform to the requirements of Specification TfNSW 3211, except that the minimum available lime content must be 80%, calculated as calcium hydroxide, as determined by Test Method TfNSW T430.

Flyash must conform to the requirements of TfNSW 3211, and must be “fine grade” in accordance with Table 1 of AS 3582.1.

The clay content (percent by mass) of the portion of filler derived from rock fines, sands and baghouse dust must not exceed 5% determined by AS 1141.13.

6.3 BINDER

6.3.1 General

Use only bitumen conforming to the requirements of Specification TfNSW 3253.

The class of bitumen to be used in the binder must be either Class 170 or Class 320 bitumen as specified in Annexure 3266/A.

Flux oil and cutter oil must conform to the requirements of AS 3568, Table 1.

The type of binder must be one of those specified in Clause 6.3.2 to Clause 6.3.5 hereunder. The type of binder for this Contract must be as specified in Annexure 3266/A.

The Supplier must provide documentary evidence of the binder quality according to Clause 6.4 of Specification TfNSW 3253 for each delivery used under the Contract.

6.3.2 Medium Curing Binder

Medium curing binder must be grades AMC2, AMC3 or AMC4 conforming to the requirements of AS 2157. Alternatively, medium curing binder may be produced by fluxing and/or cutting back Class 170 bitumen or Class 320 bitumen within the following ranges:

- Bitumen - 100 parts by volume at a temperature of 15°C
- Flux oil - 0 to 6 parts by volume at a temperature of 15°C
- Cutter oil - 12 to 30 parts by volume at a temperature of 15°C

6.3.3 Slow Curing Binder

Produce slow curing binder by fluxing back Class 170 bitumen or Class 320 bitumen within the following ranges:

- Bitumen - 100 parts by volume at a temperature of 15°C
- Flux oil - 10 to 25 parts by volume at a temperature of 15°C

6.3.4 Bitumen Emulsion

Bitumen emulsion must be Cationic Aggregate Mixing Grade (CAM) conforming to the requirements of AS 1160.

Note: Coldmix asphalt made with bitumen emulsion as the binder must be manufactured using a CAM grade bitumen emulsion and an aggregate combination designed to produce an open graded coldmix.

6.3.5 Special Bituminous Binder

When a special commercially produced bituminous binder is specified in Annexure 3266/A, the binder must conform to the Supplier's specification.

6.4 BITUMEN ADHESION AGENT

Add a bitumen adhesion agent to the binder, except where CAM bitumen emulsion is used. The bitumen adhesion agent must conform to the requirements of Specification TfNSW 3259.

When bitumen adhesion agent is mixed with the binder at a concentration within the range of 0.5 per cent to 1.0 per cent by mass of binder and then tested in accordance with Test Method TfNSW T230, the number of aggregate particles stripped must not exceed 10 per cent of the total number of aggregate particles tested.

6.5 SAMPLING AND TESTING OF MATERIALS

Carry out sampling and testing of materials in accordance with the relevant material specifications in Clause 6. Testing must comply with Annexure 3266/L.

7 QUALITY REQUIREMENTS

7.1 AGGREGATE PARTICLE SIZE DISTRIBUTION

The aggregate particle size distribution of coldmix asphalt must be within the limits specified in Table 3266.2 for dense graded coldmix, or in Table 3266.3 for open graded coldmix.

Table 3266.2 - Aggregate Particle Size Distribution for Dense Graded Coldmix

Australian Standard Sieve Size (mm)	Percentage Passing Australian Standard Sieve by Mass		
	Nominal Size		
	10 mm	14 mm	20 mm
26.5			100
19.0		100	95 – 100
13.2	100	90 – 100	77 – 90
9.5	85 – 100	70 – 85	58 – 74
6.7	70 – 85	57 – 74	45 – 60
4.75	54 – 70	45 – 65	37 – 50
2.36	35 – 50	28 – 45	22 – 36
1.18	22 – 38	15 – 30	12 – 26
0.600	12 – 27	10 – 30	6 – 20
0.300	6 – 16	5 – 17	4 – 15
0.150	4 – 11	3 – 11	2 – 10
0.075	2 – 6	2 – 5	1 – 5

Table 3266.3 - Aggregate Particle Size Distribution for Open Graded Coldmix

Australian Standard Sieve Size (mm)	Percentage Passing Australian Standard Sieve by Mass				
	Nominal Size				
	5 mm	7 mm	10 mm	14 mm	20 mm
26.5					100
19.0				100	95 – 100
13.2			100	90 – 100	50 – 90
9.5		100	85 – 100	40 – 75	30 – 65
6.7	100	80 – 100	30 – 75	10 – 35	10 – 35
4.75	80 – 100	30 – 70	20 – 55	5 – 25	5 – 25
2.36	30 – 55	10 – 40	5 – 30	0 – 15	0 – 15
1.18	10 – 40	5 – 30	0 – 22	–	–
0.600	0 – 30	0 – 22	–	–	–
0.300	–	–	–	–	–
0.150	–	–	–	–	–
0.075	0 – 4	0 – 4	0 – 4	0 – 4	0 – 4

Coldmix produced in the plant and delivered to Site will be known as “production mix”.

When determined in accordance with Test Method TfNSW T623, the particle size distribution of the production mix must not deviate from the nominated mix particle size distribution by more than the amounts shown in Table 3266.4.

Table 3266.4 - Allowable Tolerances on Nominated Mix Particle Size Distribution

AS 1152 Sieve Size (mm)	Allowable Tolerances (as a % by mass of total aggregate)
4.75 and larger	± 7
2.36 and 1.18	± 5
0.600 and 0.300	± 4
0.150	± 2.5
0.075	± 1.5

Note: Notwithstanding these tolerances, the combined aggregate particle size distribution during production shall comply with the limits of Table 3266.2 or Table 3266.3 as appropriate.

7.2 RESIDUAL BINDER CONTENT

The residual binder content, when determined in accordance with Test Method TfNSW T623, must be within the appropriate limits specified in Table 3266.5.

Table 3266.5 - Residual Binder Content of Coldmix

Nominal Mix Size (mm)	*Residual Binder Content (percent by mass of total mix)	
	Dense Graded	Open Graded
5		6.0 – 7.5
7		5.5 – 7.5
10	4.3 – 5.5	5.0 – 7.0
14	4.3 – 5.5	4.5 – 6.5
20	3.8 – 5.0	4.0 – 6.0

Note: *Some increase beyond these ranges of residual binder content may be permitted for aggregates having unusually high absorption characteristics in accordance with Test Method TfNSW T627.

If an increase in residual binder content beyond the range specified in Table 3266.5 is required to compensate for binder absorption by the aggregate, the Supplier must provide documentary evidence to substantiate this proposal when submitting nominated coldmix details.

The residual binder content of the coldmix asphalt delivered to the work site, when determined in accordance with Test Method TfNSW T623, must not deviate by more than 0.3% below nor more than 0.5% above the nominated residual binder content.

Binder content with allowable tolerances must lie within the appropriate range specified in Table 3266.5.

7.3 ESTIMATED OIL CONTENT OF TOTAL BINDER

The estimated oil content of total binder of open graded coldmix, when determined in accordance with Test Method TfNSW T616, must be within the following limits:

Nominal Size of Open Graded Coldmix Asphalt	Estimated Oil Content of Total Binder (percent of volume)
7 mm and greater	10 – 20
5 mm *	25 – 30

* Special coldmix asphalt developed for the placement of temporary signs in footpath locations for traffic signal installations. It is not a road or footpath surfacing mix.

7.4 ADHESION OF BINDER

The coldmix asphalt must show no signs of binder stripping from the aggregate when determined in accordance with Test Method TfNSW T614.

7.5 STABILITY OF COLDMIX

The stability of the coldmix asphalt must not be less than 1 kN when determined in accordance with Test Method TfNSW T615.

7.6 STOCKPILE LIFE OF COLDMIX

The required stockpile life for the coldmix asphalt must be specified in Annexure 3266/A. During the stockpile life, the mix must remain in a workable condition.

When a coldmix asphalt is required to be stockpiled for at least 3 months, use an open graded mix with a slow curing binder.

8 NOMINATED MIXES

8.1 SUBMISSION OF NOMINATED MIXES

Each coldmix so submitted will be known as a “nominated mix”.

HOLD POINT

Process Held:	Commencement to the production of coldmix asphalt.
Submission Details:	Nominated mix design together with a certification for the nominated materials.
Release of Hold Point:	The Principal will consider the submitted documents prior to authorising the release of the Hold Point.

The aggregate particle size distribution and residual binder content of a nominated mix will be known as the “nominated aggregate particle size distribution” and “nominated residual binder content” respectively.

Submit the following details of nominated mixes:

- (a) Constituent Materials
 - (i) Aggregates - source, geological type
 - (ii) Mineral filler - type, source
 - (iii) Binder - type, source, class and grade
 - (iv) Bitumen adhesion agent - name, type, source of supply
 - (v) Relevant test results verifying material properties for the above mentioned materials
- (b) Mix Design
 - (i) Nominated mix particle size distribution
 - (ii) Nominated residual binder content
- (c) Test results of the following properties of a trial batch of each nominated mix produced by the mixing plant from which the coldmix asphalt is to be supplied.
 - (i) Aggregate particle size distribution
 - (ii) Residual binder content
 - (iii) Estimated oil content of total binder (open graded coldmix only)
 - (iv) Adhesion of binder
 - (v) Stability

The required testing must have been carried out within the twelve month period prior to the date of submission to the Purchaser. Perform all phases of any particular test at one laboratory.

8.2 VARIATIONS TO NOMINATED MIXES

If the Supplier proposes to vary the quantities of the constituents in a nominated mix, or proposes to change the source of supply of any constituent, the Supplier must submit a new nominated mix in compliance with Clause 8.1.

Variations will be permitted, during production, of the actual binder content from the nominated binder content and the actual combined aggregate particle size distribution from the nominated aggregate particle size distribution within the limits shown in Tables 3266.4 and 3266.5, without the Supplier being required to submit a new nominated mix.

9 PRODUCTION OF COLDMIX ASPHALT

9.1 METHODS OF PRODUCTION

The Supplier’s methods of production must be such as to:

- (a) limit segregation of the coldmix asphalt and loss of materials;

- (b) supply a homogeneous product; and
- (c) result in the required workability and cohesion of the coldmix, which is compatible with the placing equipment, to achieve the specified compaction.

Submit details of the proposed methods of handling, storing and batching materials for coldmix asphalt, together with details of proposed mixing equipment and mixing procedures, at least 5 working days prior to the commencement of production.

9.2 PLANT

For dense graded coldmix asphalt, undertake mixing in a manufacturing plant which complies with AS 2150.

For open graded coldmix asphalt, mixing should preferably be undertaken in a manufacturing plant which complies with AS 2150. However, open approved mixer may also be used.

9.3 STORAGE AND HANDLING OF BINDER

The Supplier must implement procedures for storage and handling of binder which ensure that contamination of the binder by flushing liquids or other materials does not occur.

9.4 TEMPERATURE OF MATERIALS

Control temperatures of constituent materials by suitable thermometer elements placed in the flow of materials from the dryer and in the binder storage system or binder supply line. Thermometer registrations must be readable and accurate to within $\pm 2^{\circ}\text{C}$.

Maintain temperatures of materials in a range sufficient to ensure a homogeneous mix without causing deleterious effects to the binder through overheating.

9.5 STORAGE OF COLDMIX ASPHALT

Store coldmix where possible under cover from weather and on a concrete slab and/or in an appropriate storage bin.

Construct stockpiles in such a manner that no compaction, other than by the weight of the material itself, will result. No equipment of any kind will be permitted to run over the surface of the stockpile.

Each stockpile Lot must be identified by a location plan and must be given a unique number. The Supplier must identify the stockpile clearly and uniquely by signposting. Use this number as an identifier on all quality records. Undertake all compliance testing of the coldmix on a Lot-by-Lot basis.

Locations, size and the delivery date of the particular stockpile must be in accordance with Annexure 3266/A.

10 TRANSPORT

Discharge the coldmix into motor trucks, the bodies of which must be kept thoroughly clean and coated with a thin film of release agent, to prevent mix sticking to the body of the truck.

During transport, cover the coldmix with a suitable cover which is held down securely.

Except agreed otherwise, all motor trucks must carry not less than 6 tonnes of coldmix and be appropriate to the delivery point.

Except agreed otherwise, provide weighbridge tickets showing the gross mass of the delivery, the mass of the empty vehicle or container and the net mass of coldmix.

11 SAMPLING AND TESTING COLDMIX

Sample coldmix at either the point of loading or at the stockpile Lot.

The Supplier must undertake sampling of each nominal size of mix supplied in accordance with AS 2891.1. Testing must be in accordance with Annexure 3266/L.

ANNEXURE 3266/C – SCHEDULES OF HOLD POINTS AND IDENTIFIED RECORDS

Refer to Clause 2.2.

C1 SCHEDULE OF HOLD POINTS

Clause	Description
8.1	Submission of Nominated Mix Design

C2 SCHEDULE OF IDENTIFIED RECORDS

The records listed below are Identified Records for the purposes of TfNSW Q Annexure Q/E.

Clause	Description of Identified Record
6.3.1	Documentary evidence of binder quality for each delivery used under the Contract
8.1	Nominated mix design together with a certification for the nominated materials
9.1	Details of proposed method of handling, storing and batching materials together with details of proposed mixing equipment and mixing procedures

ANNEXURES 3266/D TO 3266/K – (NOT USED)

ANNEXURE 3266/L – SAMPLING AND TESTING OF MATERIALS

Clause	Characteristic Tested	Test Method	Minimum Frequency of Testing
6.1	Aggregate Properties	AS 1141.11 AS 1141.14 AS 1141.22 TfNSW T230 AS 1141.41 TfNSW T238 TfNSW T239	One each 250 cubic metre of aggregate
6.2	Properties of fillers	AS 1141.17 AS 1289.B1.3 AS 2350.8 AS 1129 AS 1141.8 AS 1141.13 AS 1289.C3.1	One each delivery
6.3	Properties of Residual Bitumen	AS 2341.2 AS 2341.3 AS 2341.4 AS 2341.5 AS 2341.6 AS 2341.7 AS 2341.8 AS 2341.10 AS 2341.11 AS 2341.12 AS 2341.14	As set out in TfNSW 3253
6.3	Properties of Cutback Bitumen	AS 2341.2 AS 2341.4 AS 2341.5 AS 2341.8 AS 2341.11 AS 2341.15 AS 2341.16	As set out in TfNSW 3261

6.3	Emulsion Properties	AS 2341.2 AS 2341.3 AS 2341.4 AS 2341.5 AS 2341.8 AS 2341.9 AS 2341.25 AS 2341.28 AS 2341.29 AS 2341.30 AS 3568 AS/NZS 2341.22 AS/NZS 2341.23 AS/NZS 2341.24 AS/NZS 2341.26 AS/NZS 2341.27 ASTM D244 BS 2586 TfNSW T560	As set out in TfNSW 3254
6.3	Physical Properties of Special Bituminous Binder	In accordance with manufacturer's specification	As set out in manufacture's specification
6.4	Resistance to Stripping	TfNSW T230	One each 250 cubic metre of aggregate
6.4	Initial Adhesion	TfNSW T238	One each 250 cubic metre of aggregate
6.4	Homogeneity of Liquid Bituminous Additives	TfNSW T590	One each 250 cubic metre of aggregate
7.1	Aggregate particle size distribution	TfNSW T623	One per 50 tonnes
7.2	Residual binder content	TfNSW T623	One per 50 tonnes
7.3	Estimated oil content of total binder	TfNSW T616	One per 50 tonnes
7.4	Adhesion of binder	TfNSW T614	One per 50 tonnes
7.5	Stability	TfNSW T615	One per 50 tonnes

ANNEXURE 3266/M – REFERENCED DOCUMENTS

Refer to Clause 2.4.

TfNSW Specifications

TfNSW Q	Quality Management System
TfNSW 3211	Cements, Binders and Fillers
TfNSW 3253	Bitumen for Pavements
TfNSW 3254	Bitumen Emulsion
TfNSW 3259	Bitumen Adhesion Agent (for Bitumen)
TfNSW 3261	Cutback Bitumen

TfNSW Test Methods

TfNSW T102	Pretreatment of Road Materials by Repeated Compaction
TfNSW T103	Pretreatment of Samples of Road Materials by Artificial Weathering
TfNSW T230	Resistance to Stripping of Cover Aggregates and Binders
TfNSW T238	Initial Adhesion of Cover Aggregates and Binders
TfNSW T239	Fractured Faces of Coarse Aggregate
TfNSW T430	Available CaO or CaOH in Lime
TfNSW T511	Thin Film Oven Test of Bitumen
TfNSW T560	Apparent Bitumen Content of Bitumen Emulsion and Recovery of Bitumen for Testing
TfNSW T590	Homogeneity of Precoats and Adhesion Agents
TfNSW T614	Adhesion of Binder in Bituminous Coldmix
TfNSW T615	Bulk Density and Stability of Bituminous Coldmix (Modified Hubbard-Field Procedure)
TfNSW T616	Estimated Oil Content of Total Binder of Coldmix
TfNSW T623	Binder Content and Grading of Coldmix
TfNSW T627	Aggregate Binder Absorption
TfNSW T741	Determination of Elastic Recovery and Viscosity of Polymer Modified Binders
TfNSW T742	Plastic Limit of Modified Binders

Australian Standards

AS 1129	Fly ash for use in concrete
AS 1141	Methods for sampling and testing aggregates
AS 1141.8	Water soluble fraction of filler

AS 1141.11	Particle size distribution by sieving
AS 1141.13	Material finer than 2 µm
AS 1141.14	Particle shape, by proportional calliper
AS 1141.17	Voids in dry compacted filler
AS 1141.22	Wet/dry strength variation
AS 1141.41	Polished aggregate friction value – horizontal bed machine
AS 1152	Test sieves
AS 1160	Bitumen emulsions for construction and maintenance of pavement
AS 1289	Testing soils for engineering purposes
AS 2008	Residual bitumen for pavements
AS 2150	Asphalt (hot-mixed)
AS 2157	Cutback bitumen
AS 2341	Methods of testing bitumen and related roadmaking products
AS 2341.2	Determination of dynamic (coefficient of shear) viscosity by flow through a capillary tube
AS 2341.3	Determination of kinematic viscosity by flow through a capillary tube
AS 2341.4	Determination of dynamic viscosity by rotational viscometer
AS 2341.5	Determination of apparent viscosity by ‘Shell’ sliding plate micro-viscometer
AS 2341.6	Determination of density using a hydrometer
AS 2341.7	Determination of density using a density bottle
AS 2341.8	Determination of matter insoluble in toluene
AS 2341.9	Determination of water content (Dean and Stark)
AS 2341.10	Determination of the effect of heat and air on a moving film of bitumen (rolling thin film oven (RTFO) test)
AS 2341.11	Determination of ductility
AS 2341.12	Determination of penetration of residual bitumen
AS 2341.14	Determination of flashpoint of residual bitumen
AS 2341.15	Distillation of cutback bitumen
AS 2341.16	Determination of flashpoint of cutback bitumen
AS/NZS 2341.22	Determination of particle charge
AS/NZS 2341.23	Determination of residue from evaporation
AS/NZS 2341.24	Calculation of non-aqueous volatiles content (by difference)
AS 2341.25	Determination of consistency
AS/NZS 2341.26	Determination of sieve residue
AS/NZS 2341.27	Determination of sedimentation
AS 2341.28	Determination of stone coating ability and water resistance
AS 2341.29	Determination of breaking behaviour by setting time

AS 2341.30	Recovery of residual from bituminous emulsion
AS 2350	Methods of testing portland and blended cements
AS 2357	Mineral fillers for asphalt
AS 2891.1	Methods of sampling and testing of asphalt
AS 3568	Oils for reducing the viscosity of residual bitumen for pavements
AS/NZS ISO 9001	Quality management systems – Requirements

Austroads Documents

MBT 11	Handling Viscosity of Polymer Modified Binders (Thermosel)
MBT 22	Torsional Recovery of Polymer Modified Binders
MBT 23	Force Ductility
MBT 27	Brittle Point by Fast Fraass

American Society for Testing and Materials

ASTM D244	Test Methods for Emulsified Asphalts
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British Standards

BS 2586	Specification for Glass and Reference Electrodes for the Measurement of pH
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APPENDIX A

The requirements of this Appendix apply where the order on the Supplier is placed directly by the Transport for NSW (TfNSW).

A1 MEASUREMENT

The quantity of coldmix supplied will be determined by the TfNSW from truck weighbridge dockets used at a weighbridge certified by the Department of Business and Consumer Affairs and collected at the point of delivery.

A2 PAYMENT

Payment for coldmix asphalt conforming to the Specification will be made on the basis of the quantities measured in accordance with Clause A1.

Where sampling at the point of delivery is carried out (reference Clause 7), the Supplier must provide the TfNSW with test results for the testing required before payment is made.

In the case of coldmix asphalt not conforming to the Specification, the cost of loading, freight and other charges incurred by the TfNSW prior to or subsequent to the material being rejected will be a charge against the Supplier.