

TRANSPORT FOR NSW (TfNSW)

SPECIFICATION GUIDE NR106

GUIDE TO QA SPECIFICATION R106 SPRAYED BITUMINOUS SURFACING (WITH CUTBACK BITUMEN)

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GUIDE TO QA SPECIFICATION R106 SPRAYED BITUMINOUS SURFACING (WITH CUTBACK BITUMEN)

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VERSION FOR: DATE:

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FOREWORD

TfNSW COPYRIGHT AND USE OF THIS DOCUMENT

Copyright in this document belongs to the Transport for NSW.

The Guide is not a contract document. It has been prepared to provide readers with guidance on the use of the specification.

BASE SPECIFICATION

This document is based on TfNSW QA Specification R106 Edition 4 Revision 0.

SPECIFICATION GUIDE NR106

GUIDE TO QA SPECIFICATION R106

SPRAYED BITUMINOUS SURFACING (WITH CUTBACK BITUMEN)

1 GENERAL

R106 is a QA specification and the use of QA specifications requires the Contractor to implement a quality management system that meets the Quality Management System requirements specified in Specification TfNSW Q. To comply with the intention of government policy as well as R106, sprayed bituminous surfacing works carried out using R106 requires adequate surveillance and audit by the Principal.

The traditional term for “Superintendent” has now been replaced by the “Principal” and “Principal Authorised Person” who may then assign a representative to audit or carry out surveillance on the project. In this document, only the term “Principal” is used, to provide consistency with the terminology in this and other TfNSW QA specifications.

The Annexures in this Guide provide checklists that may be used to assist surveillance and auditing of the contract.

As with other TfNSW specifications, the Contractor must prepare a Project Quality Plan (PQP) in accordance with Clause 1.2.4 for the works. The key elements in the PQP are covered in Annexure R106/D and the Principal should use the information in both the main body of the specification and the annexures when reading the Contractor’s PQP.

Other specifications used in conjunction with R106 are listed in Table NR106.1 and shown diagrammatically in Figure NR106.1. Always ensure that the latest edition of the specification is used in the preparation of the contract documents.

Table NR106.1 - TfNSW Material Specifications Used in Conjunction with R106

Specification	Title
R106	Sprayed Bituminous Surfacing (with Cutback Bitumen)
3151	Cover Aggregate for Sprayed Bituminous Surfacing
3253	Bitumen for Pavements
3258	Aggregate Precoating Agent (for Bitumen)
3259	Bitumen Adhesion Agent (for Bitumen)
3261	Cutback Bitumen

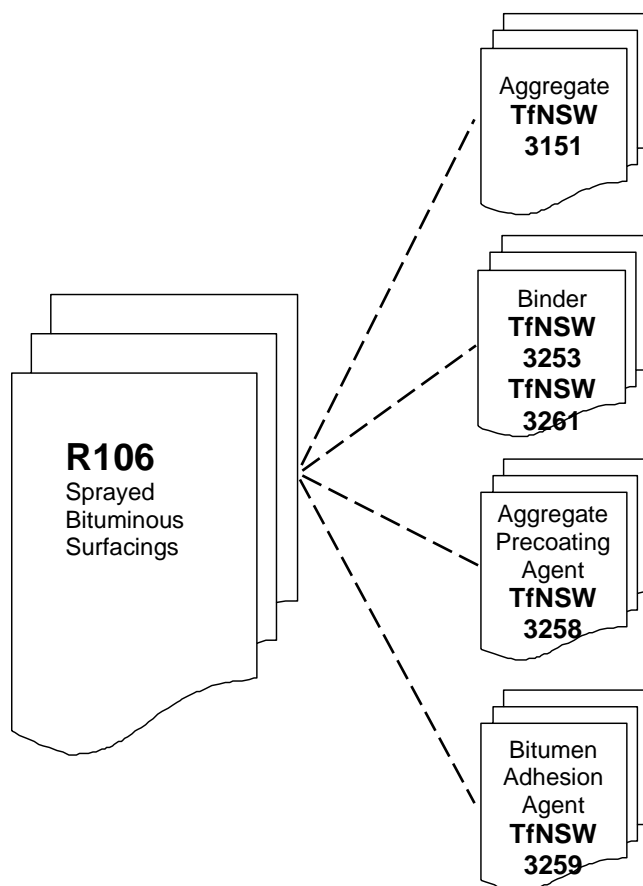


Figure NR106.1 - TfNSW Material Specifications Used in Conjunction with R106

The key reference material for this specification is the TfNSW Sprayed Sealing Guide.

For safe handling of hot bitumen, you should familiarise yourself with Austroads Bituminous Materials Safety Guide.

If you are not familiar with the terms used in this document, refer to the Austroads Glossary of Austroads Terms.

There are many industry and Austroads guides to good practice, for example:

- Austroads Guide to Pavement Technology Part 3: Pavement Surfacing
- Austroads Guide to Pavement Technology Part 4F: Bituminous Binders
- Austroads Guide to Pavement Technology Part 4J: Aggregate and Source Rock
- Austroads Guide to Pavement Technology Part 4K: Seals

These guide notes do not replace training material and TfNSW offers training courses in the application of this specification. TfNSW staff should refer to the TfNSW “Learning@RMS” or “Pavements Community (& Resources)” websites for more information about the content and timing of training course.

2 PROJECT PARAMETERS

R106 requires the TfNSW Project Manager to select appropriate parameters identified in R106 and nominate them in Annexure R106/A. These parameters are:

- Type and extent of primes, primerseals, seals and reseals with or without geotextile fabrics
- Binder type
- Nominal aggregate size
- The maximum allowable loose aggregate particles

3 SEAL DESIGN

The principles behind the TfNSW design of sprayed sealing are well documented in the TfNSW Sprayed Sealing Guide. The following text summaries the key elements in the design of primes, primerseals, seals or reseals using TfNSW Forms 395A or 395K. The sealing design information output from using these forms are:

- Bitumen application rate in L/m²
- Aggregate spread rate in m²/m³

When placing a primerseal or prime with cutback bitumen in accordance with R106, the following design input parameters are required to complete TfNSW Form 395A:

- Traffic volume in terms of vehicles per lane per day (except for primes)
- Pavement surface temperature and surface condition
- Size of aggregates (except for primes)
- Type and grade of prime and primer binder

For sealing and resealing works in accordance with R106, the following design input parameters are required to complete TfNSW Form 395K:

- Type of seal/reseal
- Texture depth of surface to be sealed/resealed
- Ball penetration depth (for seal only; not required for reseal)
- Traffic volume in terms of vehicles per lane per day and percentage of heavy vehicles
- Nominal aggregate size, shape and ALD
- Proposed bitumen type and Class
- Whether geotextile is to be used, and its type

It is important that the surface texture depth is carried out in accordance with Test Method TfNSW T240 and the location of the testing takes into consideration changes in texture depth along wheel paths and between wheel paths. Refer to Annexure R106/L for the minimum number of texture depth measurements to be taken for seal and reseal design.

4 SEALING AGGREGATES

Sealing aggregates must comply with Specification TfNSW 3151 and if not, specialist advice should be sought from the Pavement Surfacing Section.

Quarries supply aggregates to various road and building construction projects during the year and the supply of sprayed sealing aggregates are only one part of their business. As major projects in the region may impact on the supply of sealing aggregates, it is advisable to plan well in advance and investigate alternative sources to supply aggregates in the planned works program.

Also take into consideration the loss of material from the stockpile due to the thin sacrificial layer at the bottom of the stockpile which may represent up to 10 % of the volume required for the project.

Roadside stockpile management is an acceptable method to ensure reliable supply of aggregates for the works program. Ensure that the stockpile meets TfNSW guidelines, and consider covering the stockpiles to prevent moisture changes occurring after rain events and accumulation of dust.

All slag aggregates used in roadworks must be completely weathered before being used; otherwise there is significant potential for the slag aggregates to damage the seal.



Figure NR106.2 – Covered Stockpiles

(Note that the covers should extend to the base of the stockpile as shown in the left photograph, in contrast to that in the right photograph, to avoid moisture draining into the stockpile)

5 SEALING BINDERS

R106 only permits the use of bitumen classes that comply with Specification TfNSW 3253. These are:

- Class 170 and 320
- Class M500/170

It should be noted that the cutter chartⁱ is only applicable for Class 170 bitumen.

6 USE OF GEOTEXTILES

Nonwoven geotextile fabrics supplied to site must have a high melting point as the fabric will come in contact with hot bitumen during placing. In addition, the geotextile reinforced seal design will require

ⁱ TfNSW Form 382 - for cutting back the bitumen to the acceptable viscosity for spraying

an addition of up to at least 0.9 L/m² of Class 170 bitumen to fill the voids within the fabric. TfNSW is currently developing an empirical calculation to establish the additional binder required for the proposed fabric.

7 HOLD AND WITNESS POINTS

The Contractor is required to submit documents to the Principal before the commencement and at various stages of the work, and Table NR106.2 and Figure NR106.3 identifies the various documents that are required for submission.

Table NR106.2 - Summary of Key Activities Under R106

Clause	Activity	When
1.2.4	Submit Project Quality Plan	Required with tender documents
3.2	<p>Submission of Nominated Design (design details with nominated materials)</p> <p>Seal design calculations - TfNSW Form 395A (prime and primerseal) or TfNSW Form 395K (seal or reseal)</p> <p>Each constituent material:</p> <ul style="list-style-type: none"> • Aggregate test report(s), • Binder test report(s) • Aggregate precoating and bitumen adhesion agent test report (s) • Cutter oils and flux oils test report • Geotextile report (if required) 	<p>Required at least 7 days prior to commencement of sprayed surfacing work.</p> <p>Incomplete information in the submission will delay the release of this Hold Point.</p>
3.3.2	Verification of each constituent material	
3.3.3	Endorsement for each constituent material	
3.3.3	<p>Hold Point - Sealing operation using the proposed design</p> <p>Submission and acceptance of aforementioned documents required before release of Hold Point.</p>	TfNSW commences review process on receipt of submission. Release of the Hold Point is dependent on the completeness of the submission.
3.4	<p>Review of Nominated Application Rates</p> <p>Required before work commences - nominated design is adjusted for ALD of actual stockpile and surface texture of length to be sealed.</p>	Typically provided between submission of nominated design and commencement of work. In many cases the target application rates are provided on the day of sealing.
3.4	Hold Point - Sprayed sealing work for each location	TfNSW commences review process on receipt of target application rates. Release of the Hold Point is dependent on the completeness of the submission.
4.0	<p>Process Control</p> <p>Contractor responsibility. Surveillance required</p>	Ongoing after work commences.

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Clause	Activity	When
4.4	Daily records using TfNSW Form 500A or 500C	Completed form by operator after each spray run. Contractors must submit all forms by the end of the day.
5.0	Conditions for Commencement <ul style="list-style-type: none"> • Precoating of aggregate • Preparation of pavement surface • Pavement temperature and weather conditions • Protection of services and road fixtures 	<p>On the day of sealing works and prior to commencement of work.</p> <p>Monitor climatic conditions during sealing works.</p>
6.0	Application of Sprayed Bituminous Surfacing	Ongoing during work
7.0	Application of Primer, Primerbinder and Binder	Ongoing during work
8.0	Application and Incorporation of Aggregate	Ongoing during work
9.0	Witness Point - Sweeping and loose aggregate removal Measurement required after final sweeping and before opening to pre-existing signposted speed limit.	TfNSW reviews test results.
Annexures		
106/B	Measurement and Payment and Disposition of Nonconformities	Payment can only be completed after daily record forms submitted and all nonconforming lots have been resolved.

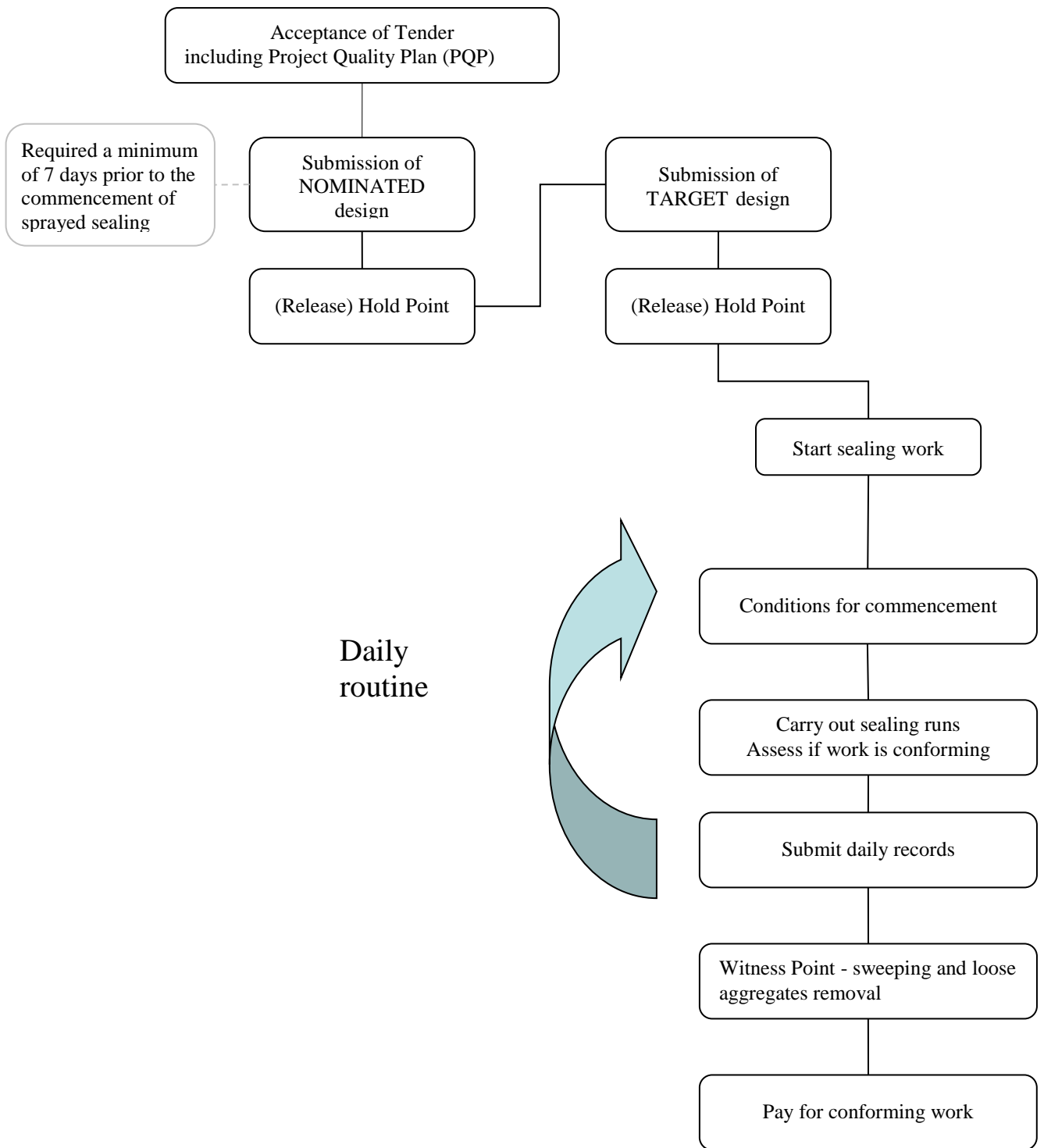


Figure NR106.3 - Flowchart Representing Timing and Content of Reports to Principal

8 BEFORE SEALING OR RESEALING

A period of at least twelve months must elapse, or the hardness of the primersealed surface measured using Test Method TfNSW T271 must be less than 2.5 mm, before the subsequent seal is applied on a primersealed surface.

Seals should not be applied over a primed surface unless it has been cured for a period of at least forty-eight hours or such longer period as is necessary for the primed surface has become completely dry.

Before sprayed sealing commences, the Contractor should give consideration to either protect, mask or replace existing pavement markings.

9 MATERIAL SUPPLY CHECKLISTS

The checklists provided in Annexures NR106/A to NR106/C are to assist those involved in the administration of sprayed sealing contracts.

The checklists are designed to improve efficiency in the supervision and to ensure the collection and collation of all appropriate documents during all stages of work. They serve as a checklist for obtaining the necessary documents and therefore, only the relevant parts of specifications are included.

They do not negate the Contractor's responsibility to provide other documents required in the contract even if they are not listed in the Annexures.

Before using the checklists, the Principal should establish:

- which bitumen supplier(s) is(are) likely to be supplying the bitumen to the project;
- whether a specialist spraying contractor will be used, and whether the specialist spraying contractor have calibrated sprayers;
- which quarry is likely to be supplying the aggregates, and whether the aggregates will be supplied precoated;
- whether adhesion agents and cutter and/or flux oils are likely to be incorporated into the bitumen.

Checklists for the supplied materials for spray sealing work are given in Annexures NR106/B and NR106/C, and Table NR106/4 summarises which checklists should be completed by the Principal.

Where a quarry has been supplying the sealing aggregates for several years, it is likely that precoating agents will remain the same, but the Principal should ensure that data provide by the quarries gives a true representation of the material properties, and that the formulation of the agent has not changed.

A separate copy of the checklist should be utilised for every individual sealing project or job.

Table NR106.3 - Summary of Material Supply Checklists in Annexures

TfNSW Specification/ Aust Std	Annexure	Remarks
R106	A	The Contractor must submit a seal design using either the estimated or tested road surface conditions and test the nominated aggregate and binder for adhesion (T238) and stripping (T230). The adhesion and stripping test results may be used for subsequent sealing projects provided the aggregates, binders and conditions of the test are the same for the project.
3151 Cover aggregates	B	Complete 3 sheets
3253 Bitumen	B	Complete 2 sheets
3258 Precoating agents	C	Complete sheet 1, with aggregate supplier to complete sheet 2. Sheet 2 should be supplied at the start of the project.
3261 Cutback bitumen	B	Complete 2 sheets
3269 Adhesion agents	C	Complete 1 sheet
AS 3568 Cutter and flux oils	C	Complete sheets 1 to 3 as applicable

10 CHECKLISTS FOR PLACING

[Under development]

11 TESTING REQUIREMENTS AND FREQUENCY OF TESTING

Sprayed sealing requires the testing of materials and their compatibility with the road surface prior to sealing, including the assessment of loose material after sealing.

The test methods to undertake the testing are well documented in TfNSW specifications and the test results and the reporting of specific information is mandatory to ensure traceability of records and compliance of the binder or other products being used.

The checklists in the Annexures require that laboratory certificates include all the information requested in the test method. If there are gaps in the reported laboratory information, this is a noncompliance of the specification and may in turn delay the release of Hold Points.

The minimum frequency of testing for each specification is listed in Annexure NR106/L. These minimum frequencies of testing must be adhered to unless:

- it is a manufactured material that is packaged in containers, with specific batch numbers and other data required provided with each delivery of the product.
- it is reduced by agreement with the Principal

For aggregate precoating and bitumen adhesion agents, the specification allows the certification of an agent only to the formulation of the product on which the tests were carried out. New certification will be required every five or three years (depending on the product) or whenever a change in product formulation is made.

The Contractor should be aware that some tests take time for completion and reporting, and they should allocate sufficient time for laboratories to complete the test.

The aggregate spread rate must be determined using 1 m² mats in accordance with TfNSW Test Method T274 along the length being sealed or by other appropriate means approved by the Principal and in accordance with the Project Quality Plan.

12 DAILY RECORDS

The Contractor is required to submit daily records of the works by lot using the following forms, appropriate to the type of seal:

- Form 500A - Cutback Bitumen, Prime and Primerseal - Daily Record
- Form 501A - Cutback Bitumen, Prime and Primerseal - Sprayer Loading Slip
- Form 500C - Cutback Bitumen Seal and Reseal - Daily Record
- Form 501C - Cutback Bitumen Seal and Reseal - Sprayer Loading Slip

13 BUSHFIRE IMPACT ON SEALING OPERATIONS

Under the new bushfire danger classification system, sprayed sealing operations must cease or not commence when the Fire Danger Rating is listed as “catastrophic”. An exemption may apply for urgent or essential repairs if permission is obtained from the Rural Fire Service. For more information on the ratings in your area, refer to www.rfs.nsw.gov.au

TfNSW has also published a Fact Sheet titled Working in the Fire Danger Season which provides more formation about the new fire danger rating system and work limitations.

ANNEXURE A - HOLD POINTS AND WITNESS POINTS

The following tables are provided in this annexure to serve as checklists for:

- Submission of nominated design and materials
- Review of nominated application rates
- Final sweeping and loose aggregate measurement

Guide to R106 Sprayed Bituminous Surfacing (with Cutback Bitumen)**NR106****R106 Submission of the Nominated Design and Materials****Project Identification:****HOLD POINT 1** – Submission of Nominated Design and Materials (required a minimum of 7 days before work commencement)**Documents required: Seal Design (TfNSW Form 395A or 395K)**

	Status (Yes/No)	Action Required (e.g. request copy/information)
Submitted on time		
All essential data recorded in design form TfNSW 395		

Documents required: Test Results

Test Report Name	Received (Yes/No)	Certificate to Verify Conformance (to Cl. 2 & 3)		Action Required
		Received (Yes/No)	NATA Endorsed (Yes/No)	
Initial Adhesion (TfNSW T238)				
Resistance to Stripping (TfNSW T230)				
Aggregate (TfNSW 3151)				
Bitumen (3253)				
Cutback Bitumen (3261)				
Polymer Binder (3252)				
Emulsion Binder (3254)				
Precoat and Adhesion Agent				
Cutter Oils and Flux Oils (AS 3568)				
Geotextile (minimum density 130g/m ² and minimum melting point 165°C)				

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RELEASE HOLD POINT 1	Yes or No	Reason:
HOLD POINT 2 – Review of Nominated Application Rates (review based on ALD from job stockpile and not nominated ALD)		
Seal Design (Form 395A or 395K)		
Required Measurements	Status (Yes/No)	Action Required
All data recorded in Forms 395A and 395K		
<ul style="list-style-type: none"> • ALD test report received for actual aggregate 		
<ul style="list-style-type: none"> • Road Surface Texture results measured for actual seal location 		
Design reviewed for actual ALD and surface texture		
Ball Penetration measured (only for seals over primes or primeseals)		
RELEASE HOLD POINT 2	Yes or No	Reason:

WITNESS POINT – Final Sweeping and Loose Aggregate Measurement		
Contractor must notify Principal of time and location prior to commencement. It is Principal's decision to be present or not.		
	Status (Yes/No)	Action Required
Client Witnessed		
Measurement of Aggregate Count Done		
Measurement or Count Acceptable		

ANNEXURE B - MATERIAL COMPLIANCE FOR BINDER AND AGGREGATE

The requirements for cover aggregates in 3151 are listed in the table below with specific details on the subsequent page.

The supply of bitumen binder is in accordance with Specifications 3253 or 3261 and two sheets represent the checklist for completion.

Minimum Requirements for Cover Aggregates – Specification TfNSW 3151 – Sheet 1 of 3

Clause	Property	Test Value or Remark
5.1	General - Are aggregates:	
	• well shaped?	Yes / No
	• clean?	Yes / No
	• sound?	Yes / No
	• free from dust, clay, dirt and other matter?	Yes / No
5.2	Uncrushed aggregated acceptable	Yes / No
6.1	Nominal size of aggregate (mm)	
6.1 (i)	Aggregate source	
	Aggregate geological type	
6.1 (iii)	Plant and methods of winning aggregate	
6.2 (i)	Polishing Aggregate Friction Value (PAFV)	
7	Stockpile sites to be prepared by	Principal / Contractor (<i>delete as applicable</i>)
10	Aggregates supplied precoated	Yes / No

Guide to R106 Sprayed Bituminous Surfacing (with Cutback Bitumen)**NR106****Minimum Requirements for Cover Aggregates – Specification TfNSW 3151 – Sheet 2 of 3**

Clause	Property and Test Method	Required Values				Reported Values		Date on NATA Report and Compliance with Specification (Yes/No)
5.2	Fractured Faces T239 - Fractured Faces of Coarse Aggregate (only for aggregates derived from gravels and metasediments)	Table 3151.1 - Fractured Face(s) Requirements				Particles with at least 2 fractured faces (% by mass)	Particles with at least 1 fractured face (% by mass)	
		Traffic Volume (vehicles/lane/day)	Particles with at least 2 fractured faces (% by mass)	Particles with at least 1 fractured face (% by mass)				
		< 500	75	-				
		≥ 500 and ≤ 2500	75	90				
		> 2500	80	98				
5.3	Shape AS 1141.14 - Particle Shape, by Proportional Calliper	Not greater than 35% where calliper ratio is 2:1 Or Not greater than 10% where calliper ratio is 3:1						
5.4	Particle size distribution T201 - Sieve Analysis of Aggregates	Table 3151.2 – Aggregate Properties				Aggregate Size		
			Percentage Passing AS Sieve (by mass)					
			Nominal size of aggregate (mm)					
		Sieve	14	10	7	5		
		19.0	100					
		13.2	90 – 100	100				
		9.50	0 – 30	90 – 100	100			
		6.70	0 – 5	0 – 40	90 – 100	100		
		4.75		0 – 5	0 – 35	90 – 100		
		2.36			0 – 10	0 – 35		
1.18	0 – 1	0 – 1	0 – 2	0 – 5				
5.4	Particles finer than 75µm T203 (by washing)	Not greater than 1.0%						

Date report submitted: (Note: Test certificates older than 3 months will be rejected and new testing carried out)

Minimum Requirements for Cover Aggregates – Specification TfNSW 3151 – Sheet 3 of 3

Clause	Property and Test Method	Required Values				Reported Value	Date of NATA Report and Compliance with Specification (Yes/No)		
5.5	ALD	Aggregate							
	TfNSW T275 (10 mm and greater)	TfNSW T235 (5 mm and 7 mm)	Nominal Size (mm)	14	10	7	5		
			Min ALD (mm)	7.0	5.0	3.5	2.5		
5.6	Durability AS 1141.22 – Wet/Dry Strength Variation	Wet Strength > 150 kN and Variation ≤ 35%							
6.2(i)	PAFV AS 1141.41 – Polished Aggregate Friction Value – Horizontal bed machine	Min PAFV ≥ 44							
	Source and Geological Type	<i>To be recorded</i>							

Date report submitted: (Note: Test certificates older than 3 months will be rejected and new testing carried out)

Delivery Requirements for Bitumen – Specification TfNSW 3253 – Sheet 1 of 2

Clause	Property	Requirement	Record
7.1	Containers	Good condition	
7.2	Procedures	Refer to Clause	
7.3	Handling temperature	Bitumen temperature ($\leq 200^{\circ}\text{C}$)	
7.4(a)	Consignment information with each delivery	Manufacturer's name	
7.4(a)		Product name	
7.4(a)		Product class	
7.4(b)		Refinery batch number	
7.4(c)		Date of loading at refinery	
7.4(d)		Intermediate delivery site	
7.4(e)		Loading temperature ($\leq 200^{\circ}\text{C}$)	
7.4(f)		Delivery temperature ($\leq 200^{\circ}\text{C}$)	
7.4(g)		Weighbridge tickets (gross mass, mass of empty vehicle or container & net mass)	
7.4(h)		Document of compliance with Quality System delivery procedure (record as received or not received)	
7.4(i)	Document that refinery batch complies		

Bitumen Test Report - Specification 3253 – Sheet 2 of 2

Clause	Property	Test Method	Binder Class and Required Values					Reported Value (for Binder Class)	Compliance with Specification (Yes/No)
			C50	C170	C320	C600	M500/170 (Write Binder Class here)	
6.2	Viscosity at 60°C (Pa.s)	AS 2341.2	40 – 60	140 – 200	260 – 380	500 – 700	400 – 600		
	Penetration at 25°C (10 ⁻⁴ m)	AS2341.12	≥ 130	≥ 62	≥ 40	≥ 20	≥ 65		
	Viscosity of RTFO residue as % of original (%)	AS 2341.10 & AS 2341.2	≤ 300				Report		
	Viscosity at 135°C (Pa.s)	AS 2341.3	0.2 – 0.3	0.25 – 0.45	0.4 – 0.65	0.6 – 0.85	≤ 1.0		
	Flash Point, open cup (°C)	AS 2341.14	≥ 250						
	Density at 15°C (kg/L)	AS 2341.7	Report						
	Sieve Residue (%)	AS 2341.20	≤ 1.0						

NATA endorsed certificate provided: Yes / No

Certificate current: Yes / No

Date verified:

Delivery Requirements for Cutback Bitumen - Specification 3261 – Sheet 1 of 2

Clause	Property	Requirement	Record
7.1	Containers	Good condition	
7.2	Procedures	Refer to Clause	
7.3	Handling temperature	Bitumen temperature (< delivery temp. + 15°C)	
7.4(a)	Consignment information with each delivery	Manufacturer's name	
7.4(b)		Refinery batch number and date of manufacture	
7.4(c)		Classification and grade designation	
7.4(d)		Loading temperature	
7.4(e)		Delivery temperature	
7.4(f)		Weighbridge tickets (gross mass, mass of empty vehicle or container & net mass)	
7.4(g)		Document that delivery procedures complied with Clause 7.2	
7.4(h)		Document that bitumen and cutter complied	

Cutback Bitumen Test Report - Specification 3261 – Sheet 2 of 2

Clause	Property	Test Method	Binder Class and Required Values						Reported Value (For binder Class)	Compliance with Specification (Yes/No)
			AMC 00	AMC 0	AMC 1	AMC 2	AMC 3	AMC 4 (Write binder class here)	
5.2	Viscosity at 60°C (Pa.s)	AS 2341.2	0.008 – 0.019	0.020 – 0.054	0.055 – 0.15	0.16 – 0.48	0.49 – 1.4	1.5 – 4.6		
	Delivery temperature (°C)		15 – 35	40 – 55	65 – 80	80 – 100	100 – 115	115 – 135		
	Approximate % cutter by volume		56	44	34	27	21	16		
	Flash Point, open cup (°C)	AS 2341.16	38	38	38	38	38	38		

NATA endorsed certificate provided: Yes / No Certificate current: Yes / No Date verified:

ANNEXURE C - MATERIAL COMPLIANCE FOR PRECOAT AGENTS, ADHESION AGENT, CUTTER AND FLUX OILS

Checklists have been provided for the supply of precoat agents to 3258 and bitumen adhesion agents to 3259.

Cutter Oils and Flux Oils are supplied in accordance with the requirements in AS 3568 and two checklists may be used to review their compliance.

The sealing contractor may order and have the quarry deliver the aggregates precoat to the stockpile site, however the quarry company must ensure that test certificates are forwarded to the sealing contractor to allow them to be checked against the specified requirements by the Principal.

Precoat Agent - Specification 3258

Supplied by:

Date on NATA endorsed certificate:

Certificate current: Yes / No

Note: For cutback bitumen, product certification is required every 5 years or whenever a change in product formulation is made - refer Clause 6 of Specification 3258.

Clause ¹	Property	Test Value or Record
7(a)	Name of manufacturer/supplier	
7(b)	Precoating agent product name (if applicable)	
7(c)	Product Reference Number	
7(d)	Date of manufacture	
7(d)	Batch numbers on containers	Yes / No
7(e)	Use by date of agent	
7	Available MSDS sheet	Yes / No
8(a)	Chemical and physical properties	
8(b)	Application rate of agent	
5.3	Homogeneity (Test Method T590)	
	• Presence of segregation	Yes / No
	• Presence of lumpiness	Yes / No
	• Presence of skins	Yes / No
5.7	• Presence of settlement	Yes / No
	Diluent and rate of dilution (if applicable)	
	Concentration of active component (Clause 5.6)	
5.5	• Average value of concentration	
	• Minimum value of concentration	
8(d)	Method of mixing	
5.6	Storage temperature range of container	
8(e)	Storage life of agent (months)	
8(f)	Effective life of agent in stockpile (months)	

Complete checklist: Certificate compliant: Yes / No

Date verified:

Adhesion Agent – Specification 3259

Supplied by:

Date on NATA endorsed certificate:

Certificate current: Yes / No

Note: For cutback bitumen, product certification is required every 5 years or whenever a change in product formulation is made - refer Clause 6 of Specification 3259.

Clause ¹	Property	Test Value
7(a)	Name of manufacturer/supplier	
7(b)	Adhesion agent product name (if applicable)	
7(c)	Product Reference Number	
7(d)	Date of manufacture	
7(d)	Batch numbers on containers	Yes / No
7(e)	Use by date of adhesion agent	
7	Available MSDS sheet	Yes / No
8(a)	Adhesion agent form	Solid / Liquid / Paste
8(a)	Chemical and physical properties	
8(c)	Effectiveness of adhesion agent	
	Homogeneity (Test Method TfNSW T590)	
	• Presence of segregation	Yes / No
5.2	• Presence of lumpiness	Yes / No
	• Presence of skins	Yes / No
	• Presence of settlement	Yes / No
5.3	Concentration of adhesion agent	
5.3	Concentration to be used alone	Yes / No
	Concentration of active component	
5.5	• Average value of concentration	
	• Minimum value of concentration	
8(d)	Method of handling and mixing	
8(e)	Mixing time	

Complete checklist: Certificate compliant: Yes / No

Date verified:

Guide to R106 Sprayed Bituminous Surfacing (with Cutback Bitumen)**NR106****Cutter Oils and Flux Oils – AS 3568 – Sheet 1 of 3**

Clause	Property	Test Method	Required Values						Reported Values			Compliance with Specification (Yes/No)
			Cutter oil		Flux oil		HFP cutter		Cutter oil	Flux oil	HFP cutter	
			Min	Max	Min	Max	Min	Max				
4.1	Aniline point (°C) <i>or</i>	ASTM D611 and/or ASTM D1319	-	65	-	75	-	-				
	Aromatic content (% by volume)	ASTM D1319	15	-	15	-	15	-				
	Density at 15°C (kg/m ³)	ASTM D1298 AS 2341.6	775	830	790	880	780	840				
	Distillation range	ASTM D86										
	Initial boiling point, IBP (°C)		140	-	175	230	140	-				
	% of original volume recovered at: 150°C		-	10	-	-	-	10				
	200°C		-	80	-	10	-	80				
	250°C		80	-	-	-	80	-				
	300°C		-	-	-	80	-	-				
	350°C		-	-	80	-	-	-				
	Final boiling point, FBP (°C)	-	270	-	-	-	270					
	Flashpoint (°C)	AS 2106										
	• Abel apparatus		38	-	-	-	61.5	-				
• Pensky-Martens closed cup	-		-	61.5	-	-	-					

NATA endorsed certificate provided: Yes / No

Certificate current: Yes / No

Date verified:

Cutter Oils and Flux Oils – AS 3568 – Sheet 2 of 3

Clause	Property	Test Method	Required Values						Reported Values		
			Cutter oil		Flux oil		HFP cutter		Cutter oil	Flux oil	HFP cutter
			Min	Max	Min	Max	Min	Max			
4.2	Cleanliness and fluidity		Clean and free of particular matter								
4.3	Miscibility		Complete with no precipitation								
4.1	Water content (% by volume)	AS 2341.9	-	0.1	-	0.1	-	0.1			
	Viscosity at 40°C (mPa.s)	ASTM D445	-	2.0	1.6	4.6	-	2.0			

NATA endorsed certificate provided: Yes / No Certificate current: Yes / No Date verified:

Heavy Flux Oils - AS3568 – Sheet 3 of 3

Clause	Property	Test Method	Required Values		Reported Value	Compliance with Specification (Yes/No)
			Min	Max		
4.1	Distillation	ASTM D86				
	• Initial boiling point (°C)		190	-		
	• Temperature at 50% recovery (°C)		320	-		
	Viscosity at 50°C (mPa.s)	ASTM D445	45	90		
	Flash point (°C) Pensky-Martens closed cup	AS 2106	61.5	-		
4.3	Miscibility		Complete with no precipitation			
4.1	Water content (% by volume)	AS 2341.9	-	0.5		
	Sulphur content (% by mass)	ASTM D1552	-	3.5		
	Sediment content (% by mass)	ASTM D473	-	0.15		
	Pour point (°C)	ASTM D97	-	6		

NATA endorsed certificate provided: Yes / No

Certificate current: Yes / No

Date verified: