

TWEED SHIRE COUNCIL

DEVELOPMENT CONSTRUCTION SPECIFICATION

C244

SPRAYED BITUMINOUS SURFACING

SPECIFICATION C244 - SPRAYED BITUMINOUS SURFACING

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SPRAYED BITUMINOUS SURFACING




CITATION

This document is named "Tweed Shire Council, Development Construction Specification C244 - Sprayed Bituminous Surfacing".

ORIGIN OF DOCUMENT, COPYRIGHT

This document was originally based on AUS-SPEC - Development Construction Specification C244 - Sprayed Bituminous Surfacing, May 2000 (Copyright SWR-TM). In the production of this Tweed Shire Council Development Specification, substantial parts of the original AUS-SPEC document have been deleted and replaced with references to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020. The adopted parts of the AUS-SPEC still remain subject to the original copyright.

VERSIONS, C244 SPRAYED BITUMINOUS SURFACING

VERSION	AMENDMENT DETAILS	CLAUSES AMENDED	DATE ISSUED (The new version takes effect from this date)	Authorised by the Director of Engineering Services
1.1	Original Version		1 July 2003	
1.2	Replace all references to SWAC with "Certifying Engineer"	Various	5 February 2016	
1.3	Replace all references to RTA with "TFNSW" and QA Specification R106 is updated with "June 2020" Remove C244.03 (e) as updated R106 no longer has this reference Wording amended to be in accordance with updated R106	Various C244.03 C244.16	11 July 2023	

DEVELOPMENT CONSTRUCTION SPECIFICATION C244

SPRAYED BITUMINOUS SURFACING

GENERAL

C244.01 SCOPE

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 1.1 “Scope”.

Amendments required to R106 - Section 1.1 “Scope”

- (a) In Paragraph 1, replace “under the Contract” with “for the Subdivision”
- (b) The following paragraph is to be included;

Requirements for quality control and testing, including maximum lot sizes and minimum test frequencies, are cited in the Specification Part for Quality Requirements.

Quality

C244.02 REFERENCE DOCUMENTS

1. Documents referenced in this Specification are listed in full below whilst being cited in the text in the abbreviated form or code indicated.

**Documents
Standards Test
Methods**

(a) Primary Reference

The TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), shall be adopted as the primary reference for Tweed Shire Council’s “Sprayed Bituminous Surfacing – C244 Construction Specification and shall be applicable as noted in this Specification.

Where the provisions of this Specification are in conflict with the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), the provisions of this Specification will take precedence.

**Order of
Precedence**

Where the provisions of this Specification do not address a specific condition, the provisions of the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020 will take precedence.

Amendments required to R106 - Section 1.25 “References”

- (a) In paragraph 1, replace “before the closing date of tenders” with before the date of the Construction Certificate submission”.
- (b) The TFNSW Specification reference “TFNSW G10 Control of Traffic” is to be replaced by the following;

Council Specifications

C201 - Control of Traffic

- (c) The following reference is to be added;

AUSTROADS Documents

SPRAYED BITUMINOUS SURFACING

AUSTROADS - Update of the Austroads Sprayed Seal Design method (AP-T68/06), Update of Double / Double Design for Austroads Sprayed Seal Method (AP-T236-13), Selection and Design of Initial Treatments for Sprayed Seal Surfacing (AP-T310-16)

C244.03 GLOBAL AMENDMENTS REQUIRED TO THE TFNSW QA SPECIFICATION R106

- (a) The term “Contract” is to be replaced throughout the Specification by the term “Subdivision Works”
- (b) The term “Contractor” is to be replaced throughout the Specification by the term “Subdivider”
- (c) The term “Superintendent” is to be replaced throughout the Specification by the term “Certifying Engineer”
- (d) “Annexure R106/1” and all references to it, is to be replaced by “Annexure C244.A”

C244.04 CONTROL OF TRAFFIC

- 1. Control of traffic is to comply with the Traffic Control Plan, prepared in accordance with Specification C201 - TRAFFIC OF CONTROL.

MATERIALS

C244.05 SAMPLING AND TESTING OF MATERIALS

- 1. Sampling and testing of materials shall be arranged by the Subdivider and carried out by a laboratory with appropriate NATA registration in accordance with the relevant material specifications cited in this Specification.

**NATA
Registration**

C244.06 BITUMINOUS MATERIALS AND ADDITIVES

(a) Bituminous Materials

- 1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 2.1.1 “Bituminous Materials”.

(b) Refinery Cutback Bitumen

- 1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 2.1.

**Cutback
Bitumen**

C244.07 AGGREGATE PRECOATING AGENT AND BITUMEN ADHESION AGENT

- 1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 2.2 “Aggregate Precoating Agent and Bitumen Adhesion Agent”.

C244.08 OILS FOR REDUCING VISCOSITY OF BITUMEN

- 1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 2.3 “Oils For Reducing Viscosity Of Bitumen”.

**Cutter
Specification**

The following paragraph is to be included;

2. Delivery and storage procedures for cutter oil delivered in drums or in bulk shall ensure that all containers are free from any deleterious material prior to filling with cutter oil, and all drums are stored so as to ensure that entry of water through seals or welds in the drums is prevented. ***Delivery & Storage***

C244.09 AGGREGATE

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 2.4 “Aggregate”. ***Specification***

DESIGN OF BITUMINOUS SURFACING

C244.10 GENERAL

1. At least 7 days before commencing sprayed bituminous surfacing work, the Subdivider shall submit to the Certifying Engineer for approval, details of the proposed bituminous surfacing design for the work together with a certification that the nominated materials for the work meet the requirements of the Specification and the plans approved with the construction certificate. Annexure C244A shall be completed by the Subdivider to conform with this approval. ***Proposed Design***
2. The Subdivider’s design rates of application of binder and aggregate for bituminous surfacing shall be in accordance with the AUSTRROADS design procedure for Sprayed Seals and he/she shall submit these design details to the Certifying Engineer. Design application rates shall be known as "nominated application rates" and materials as "nominated materials". ***AUSTRROADS Design Procedure***
3. The following additional details are required to be submitted with the proposed bituminous surfacing design: ***Additional Information Sought***
 - (a) Test results for all nominated materials.
 - (b) Aggregates - source, geological type, nominated grading, average least dimension ALD.
 - (c) Precoating agent and bitumen adhesion agent – types, proportions and manufacturer (if applicable).
 - (d) Bitumen - refinery source and certification of compliance with AS2008.
 - (e) Cutback bitumen - refinery source of bitumen, type of cutter, source of cutter, cutter oil fraction, certification of compliance with AS2157.

PRECOATING OF AGGREGATE

C244.11 GENERAL

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 5.1 “Precoating of Aggregate”.

APPLICATION OF SPRAYED BITUMINOUS SURFACING

C244.12 GENERAL

1. The Subdivider shall carry out sprayed bituminous surfacing so as to:
Work Quality
 - (a) provide a uniform application of binder with adequate adhesion to the underlying surface;
 - (b) provide a complete cover of interlocking aggregate particles, and
 - (c) achieve effective bond between binder and aggregate.
2. Details of equipment and methods to be used for sprayed bituminous surfacing shall be submitted to the Certifying Engineer for approval prior to their use on the Works.
Equipment and Methods

C244.13 PLANT

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 6.1 “Plant”.

C244.14 PREPARATION OF PAVEMENT SURFACE

1. Before the application of primer, primerbinder or binder, the pavement surface shall be swept by the use of a mechanically-operated rotary road broom or suction broom to provide a uniformly clean surface. If necessary, additional sweeping shall be done by hand, using stiff brooms. Sweeping shall, where possible, extend at least 300mm beyond each edge of the area to be sprayed.
Pavement Sweeping
2. Adherent patches of foreign material shall be removed from the surface of the pavement.
Foreign Matter on Pavement
3. For the spraying of primer or primerbinder, the pavement surface shall be slightly damp so as to impede dust interfering with initial adhesion except where explicit instructions are provided with the seal design.
Damp Pavement

C244.15 REVIEW OF NOMINATED APPLICATION RATES

1. The Subdivider shall select the locations where each lot of aggregate is to be incorporated in the Works.
Aggregate Lots
2. The Subdivider shall review the bituminous surfacing design at each location based on the actual average least dimension (ALD) test result for the lot of aggregate instead of the nominated ALD value of the aggregate adopted at design submission. The revised application rates shall be known as “target application rates”.
Target Application Rates

3. The Subdivider shall give the Certifying Engineer at least five (5) working days notice of the Subdivider's intention to commence sprayed bituminous surfacing. This notice shall confirm spray rates, aggregate size and ALD.

C244.16 BITUMEN TEMPERATURE REQUIREMENTS

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 6.6 “Bitumen Temperature Requirements” and Section 6.3 “Temperature”.

Amendments required to R106 - Section 6.6 “Bitumen Temperature Requirements”

- (a) In paragraph 4, replace “Bush Fires Act, 1948 and the Local Government Act 1919” with “Rural Fires and the Local Government Acts”.

Amendments required to R106 - Section 6.3 “Temperature”

- (b) Replace the final paragraph “Any bituminous material which has been overheated shall not be used in the work” with “Any bituminous material which has been overheated or stored in temperatures from Tables R106.2 and R106.3 for more than 10 hours shall not be used in the work unless sampled, retested and confirmed to be within the conformance requirements of AS 2008. Non-conforming bituminous material shall be disposed of legally and responsibly.”

C244.17 PAVEMENT TEMPERATURE AND WEATHER CONDITIONS

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 5.3 “Pavement Temperature And Weather Conditions”.

C244.18 INCORPORATION OF CUTTER OIL, FLUX OIL AND ADHESION AGENT

(a) Cutter Oil

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 6.7.1 “Cutter Oil”.

(b) Flux Oil

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 6.7.2 “Flux Oil”.

Mixing Flux Oil

(c) Bitumen Adhesion Agent

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 6.7.3 “Bitumen Adhesion Agent”.

Mixing Adhesion Agent

C244.19 APPLICATION OF PRIMER, PRIMERBINDER AND BINDER

(a) General

Limit on Spray Area

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 7.1 “Application Of Primer, Primerbinder And Binder - General”.

SPRAYED BITUMINOUS SURFACING

(b) Primer and Primerbinder

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 7.2 “Primer and Primerbinder”.

Amendments required to R106 - Section 7.2 “Primer and Primerbinder”

- (a) The final paragraph of Section 7.2 is to be replaced with the following.

After application of a primerbinder, a period of at least fourteen (14) days shall elapse before the binder for a seal is applied.

(c) Binder

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 5.8.3 “Binder”.

(d) Operation of the Sprayer

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 5.8.4 “Operation of the Sprayer”.

Amendments required to R106 - Section 6.2 “Operation of the Sprayer”

- (a) In paragraph 8, replace “under the Contract” with “for the Subdivision”.

C244.20 APPLICATION AND INCORPORATION OF AGGREGATE

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 8 “Application And Incorporation Of Aggregate”.

Amendments required to R106 - Section 8 “Application and Incorporation of Aggregate”

- (a) Replace the last paragraph with the following;

When the aggregate has been evenly spread and embedded in the binder, any remaining loose particles of aggregate shall be removed from the pavement and disposed of responsibly by the Subdivider.

**Removal of
Loose
Particles**

Initial sweeping & removal of loose aggregate material from the road surface should be carried out :-

- (i) on the same day if the traffic volume is more than 10000 vehicles per day;
- (ii) the next day if the traffic volume is between 1000 and 10000 vehicles per day;
- (iii) within five (5) days if the traffic volume is less than 1000 vehicles per day.

For 10mm and 14mm seals, sweeping shall be continued until all loose particles are less than the maximum nominated level of loose stones in the table below. Areas where the speed limit exceeds 60 km/h shall have temporary 60 km/h speed zoning until that time. Refer Specification C201 – CONTROL OF TRAFFIC for application of work site speed limits on Public Roads.

Urban areas	20 particles per m ²
Other medium to high traffic (>250 vehicles/lane/day)	30 particles per m ²
Other low traffic (≤250 vehicles/lane/day)	40 particles per m ²

C244.21 WORK RECORDS

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 4.4 “Work Records”. ***Sprayer Run Records***

C244.22 PROTECTION OF SERVICES AND ROAD FIXTURES

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020, Section 5.4 “Protection of Services and Road Fixtures”.

NONCONFORMANCE OF MATERIALS AND WORK

C244.23 GENERAL

1. Refer to the TFNSW QA Specification R106 – Sprayed Bituminous Surfacing (with Cutback Bitumen), June 2020.

Amendments required to R106

- (a) The following paragraph is to be added;

B2.1 General

If any materials supplied fail to conform to the requirements in this Specification or if any section of sprayed bituminous surfacing work fails to conform to the requirements of this Specification - whether failure of the work is due to bad workmanship, defective materials supplied by the Subdivider or materials made defective by the method of operation adopted or any other cause, then such failure or failures shall constitute a 'Non-conformance'.

Conditions

C244.24 ACCEPTANCE OF NONCONFORMANCES

1. Nonconformances of materials and work may be accepted at the absolute discretion of the Certifying Engineer. ***Certifying Engineer's Authority***

SPRAYED BITUMINOUS SURFACING

2. Nonconformance related to the achieved application rates for primer, primerbinder or binder as determined from the Bituminous Surfacing Daily Record shall be dealt with by the Certifying Engineer strictly on the basis set out below:
 - (a) Variations will be considered as departures from the design target application rates after allowing for adjustments due to adhesion agent, cutting oil, flux oil and temperature. Adjustments made on site due to surface condition and stockpile ALD dimension will also be allowed for, subject to a record of their prior approval by the Certifying Engineer being available.
 - (b) Variations up to ± 5 per cent of the adjusted design target application rate shall be deemed as conforming.
 - (c) Variations greater than ± 5 per cent shall be rejected.

SPECIAL REQUIREMENTS

C244.25 RESERVED

C244.26 RESERVED

C244.27 RESERVED

C244.28 RESERVED

C244.29 RESERVED

LIMITS AND TOLERANCES

C244.30 SUMMARY OF LIMITS AND TOLERANCES

1. The limits and tolerances applicable to the various clauses in this Specification are summarised in Table C244.3 below:

Item	Activity	Limits/Tolerances	Spec Clause
1.	Design of Bituminous Surfacing	Subdivider to provide details of design to Certifying Engineer at least 7 days before proposed commencement of work	C244.10
2.	Commencement of Work	Subdivider to give 5 days notice to the Certifying Engineer of intention to commence work	C244.15
3.	Sweeping of Pavement Surface	Sweeping shall extend at least 300mm beyond each edge of the area to be sprayed	C244.14
4.	Bitumen Heating		
	(a) Bitumen Temperature	When incorporated with cutter oil, bitumen shall be in temperature ranges as per Table R106.1 (TFNSW QA Specification R106)	C244.16
	(b) Refinery Cutback Bitumen Temperature	At the time of spraying shall be in temperature range as per Table R106.2 (TFNSW QA Specification R106)	C244.16
	(c) Retention of Temperature	Bituminous materials shall not be held at temperatures within the ranges of Tables R106.1 or R106.2 (TFNSW QA Specification R106) for periods in excess of 10 hours.	C244.16
5.	Spraying Temperature		
	(a) Pavement Temperature	Bituminous surfacing shall not be undertaken if the pavement temperature has not been at or above 10°C for at least one (1) hour before commencement of spraying or if the pavement temperature falls below the specified minimum during the period of spraying.	C244.17
6.	Cutting Back Bitumen	Circulation of hot bitumen and cutter oil mixture in the sprayer shall be at the rate of 700 litres per minute for twenty (20) minutes.	C244.18

SPRAYED BITUMINOUS SURFACING

Item	Activity	Limits/Tolerances	Spec Clause
7.	Fluxing Bitumen or adding Bituminous Adhesion Agent	Circulation of fluxing oil or bituminous adhesion agent with hot bitumen shall be at the rate of 700 litres per minute for fifteen (15) minutes.	C244.18
8.	Application of Bituminous Material		
	(a) Spray Area	Area to be sprayed shall be limited to area which can be covered by aggregate at target application rate within 15 minutes of spraying.	C244.19
	(b) Application Rates	Application rates and quantities shall apply to a temperature of 15°C and have tolerances of ±5% as set out in Clause C244.24.	C244.19
	(c) Primer	At least a 48 hour period shall elapse after spraying of primer before binder for a seal is applied.	C244.19
	(d) Primerbinder	At least a 14 day period shall elapse after spraying of primerbinder before application of binder.	C244.19
9.	Application of Aggregate		
	(a) Spreading Time	Application of aggregate shall be completed within 15 minutes of spraying bitumen or cutback bitumen on each section.	C244.20
10.	Rolling		
	(a) Roller Numbers and Type	Initial rolling shall be carried out with two (2) or more dual axle smooth pneumatic tyred multi-wheeled rollers. Minimum load of one (1) tonne per tyre and minimum tyre pressure 550KPa.	C244.20
	(b) Backrolling	(i) For traffic volume of <500 vehicles per lane per day, backrolling for minimum of one (1) hour per 1000 square metres sprayed.	C244.20
		(ii) For traffic volume >500 vehicles per lane per day, backrolling for minimum of one (1) hour per 1500 square metres sprayed.	C244.20

Table C244.3 - Summary of Limits and Tolerances

ANNEXURE C244.A

DETAILS OF WORK

Section		Prime Binder Type	Primer Seal		Seal or Reseal	
From	To		Binder Type	Aggregate Nom. Size	Binder Type	Aggregate Nom. Size

Note: Prime and Primer Seal Binder Type shall be indicated in this Annexure using the descriptive terms as follows:

- Very Light Prime or Primer - equivalent cut back bitumen to grade AMCOO.
- Light/Medium Prime or Primer - equivalent cutback bitumen to grade AMCO or AMC1.
- Heavy Prime or Primer - equivalent cut back bitumen to grade AMC1 or AMC2.