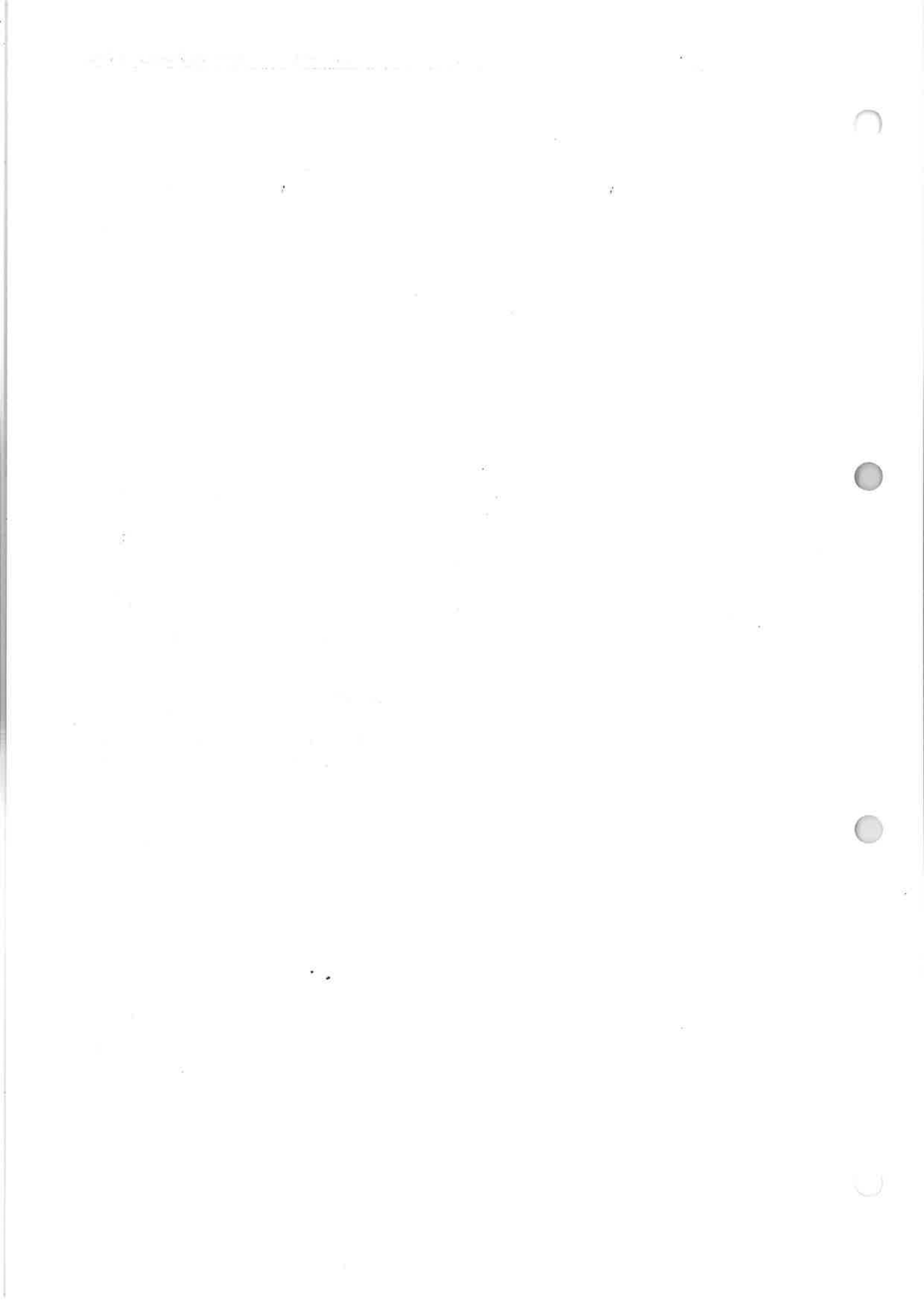


DEVELOPMENT  
CONSTRUCTION  
SPECIFICATION

C244

**SPRAYED  
BITUMINOUS SURFACING**



**SPECIFICATION C244 - SPRAYED BITUMINOUS SURFACING**

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**SPRAYED BITUMINOUS SURFACING**

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**SPECIFICATION C244  
SPRAYED BITUMINOUS SURFACING**

**GENERAL**

**C244.01 SCOPE**

1. The work to be executed under this Specification consists of the supply of all materials and the application of any or all of the following types of sprayed bituminous surfacing:

(i) Prime

Consisting of the application of a primer of field or refinery cutback bitumen without aggregate to provide penetration of the surface (preferably from 5 to 10 mm) and waterproofing.

(ii) Primerseal

Consisting of the application of a primerbinder of field or refinery cutback bitumen to provide surface penetration (preferably from 2mm to 5mm), into which aggregate is incorporated to provide a temporary wearing surface prior to the application of the final wearing surface.

(iii) Seal or Reseal

Consisting of the application of a bitumen binder into which aggregate is incorporated to provide a durable wearing surface.

2. The locations and required types of sprayed bituminous surfacings, including types of binders and aggregate sizes, shall be as shown on the Drawings and/or as detailed in tabular form, for example see Annexure C244.A.

3. For multiple application treatments, the binder and aggregate may be required to be laid in one or more separate applications.

**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) Council Specifications

C201 - Control of Traffic

(b) Australian Standards

AS 2008 - Residual bitumen for pavements.  
 AS 2157 - Cutback bitumen.  
 AS 2341.9 - Determination of water content.  
 AS 3568 - Oils for Reducing the Viscosity of Bitumen for Pavements  
 AS 2758.2 - Aggregate for sprayed bituminous surfacing.

## SPRAYED BITUMINOUS SURFACING

### (c) RTA Specifications and Forms

- MR466 - Sprayed Bituminous Surfacing Cutback Chart
- 3253 - Bitumen for Pavements
- 3258 - Aggregate Precoating Agents
- 3259 - Bitumen Adhesion Agents
- 3261 - Cutback Bitumen
- RTA Form 23 - Bituminous Surfacing Daily Record

### (d) Government Legislation

- Rural Fires Act 1997
- Rural Fires Amendment Act 2000
- Rural Fires and Environmental Assessment Legislation Amendment Act 2002
- Local Government Act, 1993

### (e) Other

- AUSTROADS - Design of Sprayed Seals.

## MATERIALS

### C244.03 BINDERS

#### (a) Bitumen

*Bitumen*

1. Bitumen shall be Class 170 conforming to AS2008.

#### (b) Refinery Cutback Bitumen

*Cutback Bitumen*

1. Refinery cutback bitumen shall conform to AS 2157.

### C244.04 ADDITIVES

#### (a) Cutter Oil

*Cutter Specification*

1. Cutter oil shall conform to the requirements of AS3568, displaying an Abel flash point of not less than 38°C and a viscosity at 40°C not greater than 2.0 millipascal seconds, with the following qualifications to the properties for its classification as set down in AS3568 Table 1:

- (i) Either "Aniline point" or "Aromatic content" is acceptable.
- (ii) There shall be no "Density" requirement.
- (iii) The presence of water, assessed visually as an immiscible phase in any sample of the material, shall be grounds for its rejection. AS2341.9 shall not be demanded as a referee test if more than 0.1% of liquid water is found in any delivery or batch.
- (iv) If the viscosity is calculated by the equation given in Table 1, Note 3 of AS3568, "f" shall be taken to be 0.0009 per °C.

2. Delivery and storage procedures for cutter oil delivered in drums shall ensure that all containers are clean and 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*

**(b) Adhesion Agent**

**Adhesion Agent**

1. Bitumen adhesion agents shall conform to RTA Specification 3259.

**C244.05 AGGREGATE**

1. Aggregate shall conform to AS 2758.2.

**Specification**

2. The Contractor shall obtain test results for each lot/stockpile of aggregate, and certification of compliance with AS 2758.2 from a suitably accredited NATA laboratory, before aggregate from the lot is incorporated in the Works.

**Test Results**

**C244.06 PRECOATING AGENT**

1. Aggregate precoat agent(s) shall conform to RTA Specification 3258.

**Precoat**

**C244.07 SAMPLING AND TESTING OF MATERIALS**

1. Sampling and testing of materials shall be arranged by the Contractor and carried out by a NATA registered laboratory in accordance with the relevant materials specifications cited in this Specification.

**Contractor's Responsibility**

**DESIGN OF BITUMINOUS SURFACING**

**C244.08 GENERAL**

1. The Contractor shall carry out the design of bituminous surfacing in accordance with the procedure contained in AUSTRROADS Design of Sprayed Seals. Design application rates shall be known as "nominated application rates" and materials as "nominated materials."

**AUSTRROADS Design Procedure**

2. The following additional details are required:

**Additional Information Sought**

- (i) Test results for all nominated materials.
- (ii) Aggregates - source, geological type, nominated grading, ALD.
- (iii) Precoating agent and bitumen adhesion agent - types and proportions.
- (iv) Bitumen - refinery source, certification of compliance with AS2008.
- (v) Cutback bitumen - refinery source of bitumen, source of cutter, certification of compliance with AS2157.

**APPLICATION OF SPRAYED BITUMINOUS SURFACING**

**C244.09 GENERAL**

1. The Contractor shall carry out sprayed bituminous surfacing so as to: **Work Quality**
  - (i) provide a uniform application of binder with adequate adhesion to the underlying surface;
  - (ii) provide a complete cover of interlocking aggregate particles, and
  - (iii) achieve effective bond between binder and aggregate.
2. The Contractor shall give the Council's Development Engineer a minimum two days notice of intention to commence sprayed bituminous surfacing. **Contractor to Notify**

**C244.10 PRECOATING OF AGGREGATE**

1. The aggregate precoating agent shall be applied to the aggregate in a manner and at a rate and time which will provide a complete, light, uniform, effective cover of all aggregate particles at the time of spreading. **Application**
2. Precoating of aggregate shall not be carried out when rain is imminent. If aggregate has been precoated and rain appears imminent, the aggregate shall be adequately covered to prevent the precoating material being washed from the aggregate particles. **Weather Conditions**
3. The Contractor shall take precautions, such as covering stockpiles, to prevent settlement of dust, penetration of moisture or drying out of the precoating agent on the stockpiled aggregate. **Cover for Stockpiles**

**C244.11 PLANT**

1. A mechanical sprayer shall be used to apply primer, primer binder and binder. The sprayer shall have a current Sprayer Certificate (RTA Form 354) issued by the Roads and Traffic Authority of NSW. **Sprayer Certificate**
2. The spray nozzles shall be of the make and type endorsed on the Sprayer Certificate. Satisfactory nozzles of similar type shall replace any nozzles, which may be damaged or become unduly worn or defective. A sufficient number of nozzles for this purpose shall be available at all times. **Spray Nozzles**
3. Mechanical spreading equipment shall be used to spread aggregate and shall be capable of achieving a uniform spreading rate. **Aggregate Spreader**
4. Rollers shall be in accordance with Clause C244.20. **Rollers**
5. The Contractor shall remove from the work any plant or equipment not fully operational or not in a satisfactory condition for carrying out work in accordance with this Specification. **Faulty Equipment**

**C244.12 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 bass or similar brooms. Sweeping shall 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.   | <i><b>Foreign Matter on Pavement</b></i> |
| 3. | For the spraying of primer or primerbinder, the pavement surface shall be slightly damp so as to impede dust interfering with initial adhesion. | <i><b>Damp Pavement</b></i>              |

**C244.13 REVIEW OF NOMINATED APPLICATION RATES**

- |    |  |  |
|----|--|--|
| 1. | The Contractor shall select the locations where each lot of aggregate is to be incorporated in the Works.  | <i><b>Aggregate Lots</b></i>           |
| 2. | The Contractor shall review the bituminous surfacing design at each location based on the actual ALD test result for the lot of aggregate instead of the ALD value of the nominated aggregate, and using the AUSTRROADS Design of Sprayed Seals. The revised application rates shall be known as "target application rates." | <i><b>Target Application Rates</b></i> |

**C244.14 BINDER TEMPERATURE REQUIREMENTS**

- |    |  |  |
|----|--|--|
| 1. | Bitumen and cutback bitumen shall be within the range shown in Table C244.1 when incorporated with cutter oil.   | <i><b>Mixing Temperature</b></i>         |
| 2. | Temperature ranges for spraying of primers, primer binders and binders shall be within the ranges shown in Table C244.1.   | <i><b>Spraying Temperature</b></i>       |
| 3. | The Contractor shall measure and record the temperature of the bituminous material, using a suitable means. The thermometer shall be verified as accurate to within 2.5 percent of the correct temperature.  | <i><b>Measurement of Temperature</b></i> |
| 4. | If the temperature of the bituminous material is below the applicable lower limit from Table C244.1, the bituminous material may be heated providing safe heating practices are adopted. Burners shall not be used unless the level of the material in the heating tank is at least 250 mm above the tops of the heating tubes. The Contractor shall comply with the current legislative requirements. Two or more suitable fully-charged pressurised chemical fire extinguishers shall be placed conveniently to the heaters at all times while heating is in progress. | <i><b>Safe Heating Practices</b></i>     |
| 5. | During heating, the temperature of the bituminous material shall not exceed the applicable upper limit from Table C244.1. The temperature of the bituminous material just above the heating tubes shall be checked at regular intervals to ensure that there is no local overheating.  | <i><b>Heating Limits</b></i>             |
| 6. | Bituminous materials shall not be held at temperatures within the ranges shown in Tables C244.1 for periods in excess of ten hours.  | <i><b>Max Period of Heating</b></i>      |
| 7. | Any bituminous material that has been overheated shall not be used in the work. The Contractor shall record disposal of such material confirming its exclusion from use under this contract.   | <i><b>Overheated Bitumen</b></i>         |

**C244.15 PAVEMENT TEMPERATURE AND WEATHER CONDITIONS**

- |    |  |   |
|----|--|---|
| 1. | The Contractor shall measure and record pavement temperatures at regular intervals during the course of the work. For this purpose, a spirit or mercury-in-glass thermometer or other suitable type of thermometer shall be placed in direct contact with the pavement and allowed to remain in position until the reading becomes steady. When a spirit or mercury-in-glass thermometer is used to measure pavement temperature, the bulb of the thermometer shall be covered from direct sunlight with a small heap of grit or similar material. | <i><b>Measurement and Recording</b></i> |
| 2. | If the pavement is partly in sun and partly in shade, the temperatures for both conditions shall be taken and recorded.  | <i><b>Sun and Shade Conditions</b></i>  |

## SPRAYED BITUMINOUS SURFACING

3. Spraying primers, primer binders and binders shall be undertaken only if the pavement temperature has been at or above the minimum temperature shown in Table C244.1 for at least one hour before commencement of spraying and does not fall below the specified minimum pavement temperature for spraying during the period of spraying.

**Minimum  
Pavement  
Temperature**

4. Spraying shall not be carried out on a wet pavement, while rain appears imminent or during high winds or dust storms.

**Spraying  
Conditions**

| TYPE OF MATERIAL | CLASS OR GRADE | EQUIVALENT % CUTTER | MAX HEATING TEMP (°C) | MIN PAVEMENT TEMP (°C) | SPRAYING TEMP (°C) |
|------------------|----------------|---------------------|-----------------------|------------------------|--------------------|
| Bitumen          | 170            |                     | 190                   | 10                     | 160 - 190          |
| Cutback Bitumen  | AMC 00         | 56)                 | 30                    | 10                     | 10 - 20            |
|                  | AMC 0          | 44)                 | 55                    | 10                     | 35 - 55            |
|                  | AMC 1          | 34)                 | 80                    | 10                     | 60 - 80            |
|                  | AMC 2          | 27) Conven-         | 100                   | 10                     | 75 - 100           |
|                  | AMC 3          | 21) tional          | 115                   | 10                     | 95 - 115           |
|                  | AMC 4          | 16) Cutter          | 135                   | 10                     | 110 - 135          |
|                  | AMC 5          | 11)                 | 150                   | 10                     | 120 - 150          |
|                  | AMC 6          | 7)                  | 160                   | 10                     | 135 - 160          |
| Cutback Bitumen  | FC2            | 25)                 | 95                    | 5                      | 70 - 75            |
|                  | FC3            | 20) Fast            | 95                    | 5                      | 80 - 90            |
|                  | FC4            | 15) Evapo-          | 110                   | 5                      | 95 - 110           |
|                  | FC5            | 10) rating          | 140                   | 10                     | 120 - 140          |
|                  | FC6            | 7) Cutter           | 150                   | 10                     | 130 - 150          |
|                  | FC7            | 3)                  | 160                   | 10                     | 140 - 160          |

**Table C244.1 - Temperature Limits**

### C244.16 INCORPORATION OF CUTTER OIL AND ADHESION AGENT

#### (a) Cutting Back Bitumen

1. The Contractor shall determine and record the proportion of cutter oil required for each sprayer load, using MR Form 466 and based on the measured pavement temperatures.

**Contractor's  
Responsibility**

2. The cutter oil, without being previously heated, shall be pumped into the sprayer, followed by the hot bitumen. The full sprayer load of cutback bitumen shall be circulated at a rate of at least 700 litres per minute for twenty minutes to ensure that the mixture is homogeneous.

**Mixing Cutter  
Oil**

3. If a part sprayer load of field cutback bitumen is unused on the date of mixing, and needs to be returned to the heater tanks, it shall be placed in an empty tank reserved for that purpose. No bitumen or cutter shall be added to the returned cutback bitumen unless the tank is fitted with an effective mechanical mixing system. When the returned cutback bitumen is subsequently used as part of a sprayer load, allowance shall be made for the cutter oil contained in the returned cutback bitumen.

**Unused  
Cutback  
Bitumen**

#### (b) Bitumen Adhesion Agent

1. Where bitumen adhesion agent is to be included, it shall be added to the bitumen in the sprayer and the mixture circulated at a rate of at least 700 litres per minute for fifteen minutes before spraying.

**Mixing  
Adhesion  
Agent**

**C244.17 APPLICATION OF PRIMER, PRIMERBINDER AND BINDER**

**(a) General**

**Limit on Spray Area**

1. The area to be sprayed with primerbinder or binder shall be limited to the area that can be covered with aggregate at the target application rate within fifteen minutes of spraying bitumen or cutback bitumen.

2. Nominated and target application rates and quantities of primer and primerbinder shall apply to the whole material, including cutter oil, measured at 15°C.

**Application Rates**

3. Nominated and target application rates and quantities of binder shall be based on the volumes of bitumen measured at a temperature of 15°C and shall not include any bitumen adhesion agent and/or cutter oil.

**Nominated and Target Rates**

4. Where bitumen adhesion agent and/or cutter oil have been added to the binder, the application rate of the total binder at 15°C shall be adjusted to allow for the quantities of bitumen adhesion agent and/or cutter oil in the mixture.

**Adjustment of Application Rate**

5. The Contractor shall determine the hot application rate of total binder, including bitumen adhesion agent and/or cutter oil, using MR Form 466.

**Calculation of Hot Application**

6. Where refinery cutback bitumen is used as the binder, the target application rate of binder shall be increased by the Contractor to allow for the percentage cutter oil in the mixture as indicated in Table C244.1.

**Refinery Cutback Bitumen Variation**

**(b) Operation of the Sprayer**

1. The type of spray nozzles to be used on the spray bar of the sprayer shall be compatible with the nature of the binder to be sprayed and its application rate.

**Nozzle Type**

2. Where the longitudinal edges of spray runs are not required to overlap, either special type end nozzles or intermediate nozzles set with a jig as end nozzles may be used. Where an overlap is required, the overlap of spray between adjacent longitudinal runs shall be 50 mm for special type end nozzles. If intermediate nozzles are to be used to overlap adjacent longitudinal sprays the nozzles shall be set in the normal manner for intermediate nozzles and the overlap shall be 300 mm.

**Spray Overlap**

3. The spraying of primer, primerbinder or binder for each run of the sprayer shall commence on a protective strip of heavy paper weighing not less than 120 grams per square metre laid across and held securely to the pavement surface beforehand. The sprayer shall commence moving at a sufficient distance in advance of the protective strip to ensure that the road speed for correct application is attained at the commencement of spraying.

**Protective Paper Strip**

4. The sprayer shall maintain a constant road speed throughout the length of each sprayer run.

**Road Speed**

5. The spraying for each run shall terminate on a protective strip of paper laid across and held securely to the pavement surface beforehand. The width of paper at the commencement and/or termination of each run shall not be less than that endorsed on the Sprayer Certificate.

**Terminating Paper Strip**

6. Spraying shall cease immediately any defect develops in the spraying equipment and spraying shall not recommence until the fault has been rectified.

**Equipment Defects**

7. Where any blockage or partial blockage of nozzles occurs, spraying shall cease immediately. If the blockage is due to the condition of the binder being sprayed, that load together with any binder from the same bulk tanker or supply unit shall not be used.

**Nozzle Blockage**

## **SPRAYED BITUMINOUS SURFACING**

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8. Where a mechanical sprayer is not able to satisfactorily spray small areas or areas of irregular shape, such areas shall be sprayed by means of the hand spray equipment attached to the sprayer. **Hand Spraying**
9. After each sprayer run, the quantity of binder sprayed shall be checked against the area covered and any necessary adjustments shall be made to ensure that the target application rate is achieved in subsequent runs. If the actual application rate of binder after three runs differs by more than 5 per cent from the target application rate, the sprayer shall not be used until a new Sprayer Certificate has been obtained. **Application Rate Checks**
10. Areas not within 5 percent of the target application rate of primer, primerbinder or binder shall constitute a 'Non-conformance' under the Contract. **Non-conformance**

### **C244.18 WORK RECORDS**

1. Particulars of the work performed shall be recorded on RTA Form 23 - Bituminous Surfacing Daily Record. Details of primer, primerbinder, binder and aggregate applied shall be recorded immediately after every sprayer run. The Contractor's representative shall sign each form as a true record of the work performed. The Contractor shall supply to the Council's Development Engineer a copy of each completed form within 2 days. Confirmation of the works records will be required prior to release of linen plan. **Sprayer Run Records Submitted to Council.**

### **C244.19 CONTROL OF TRAFFIC**

1. The Contractor shall provide for traffic in accordance with the requirements of Specification C201 - CONTROL OF TRAFFIC while undertaking the work and shall take all necessary precautions to protect the work from damage until such time as the new seal coat has developed sufficient strength to carry normal traffic without disturbance of the aggregate. **Contractor's Responsibility**
2. Where early use of the new seal is needed to facilitate the movement of traffic, vehicles may be allowed to run on the work after initial rolling has taken place provided that vehicles are controlled to such slow speeds that no displacement of aggregate occurs. Where necessary, the Contractor shall use patrol vehicles to ensure that traffic travels at an acceptable speed. **Speed Control**
3. The Contractor shall take all necessary steps to avoid or minimise delays and inconvenience to road users during the course of the work. Where adequate detours or side tracks are included in the Contract or are otherwise available, traffic shall be temporarily diverted while the work is in progress. **Minimise Traffic Delays**
4. If facilities for the diversion of traffic are not available, the Contractor may spray part width of the pavement in the one operation and make available to traffic the adjacent strip of roadway, except during the actual spraying operation when all traffic movement through the work shall cease. Traffic shall not be permitted to encroach upon the edge of the sprayed bituminous material until such time as it is covered with aggregate. **Part Width Spraying**

### **C244.20 APPLICATION AND INCORPORATION OF AGGREGATE**

1. The application of aggregate shall proceed after spraying is commenced and shall be completed within fifteen minutes of spraying bitumen or cutback bitumen. **Time for Completion**
2. Wet aggregate shall not be used. **Wet Aggregate**
3. The Contractor shall apply the aggregate of the specified nominal size and at the target aggregate application rate. Sufficient loaded and measured trucks of dry aggregate shall be at the site to provide full cover for the area sprayed. **Procedure**
4. The aggregate shall be spread uniformly over the sprayed surface by means of suitable mechanical spreading equipment. **Uniform Application**

- |  |   |
|--|---|
| <p>5. Any bare or insufficiently covered areas shall be re-run by the mechanical spreader or covered by hand as necessary to give a uniform and complete coverage. Any aggregate spread in excess of the target aggregate application rate shall be removed before rolling is commenced.</p>   | <p><b>Deficient or Excess Aggregate</b></p> |
| <p>6. After the aggregate has been applied to each section of the work, initial rolling shall be carried out with two or more dual axle smooth pneumatic tyred multi-wheel rollers of minimum load of one tonne per tyre and minimum tyre pressure of 550 kPa. Initial rolling shall continue until the aggregate is firmly embedded in the primerbinder or binder.</p>  | <p><b>Initial Rolling</b></p>               |
| <p>7. If the aggregate is not evenly distributed over the surface of the pavement, the surface shall be traversed with a light drag broom or by light hand brooming after the initial rolling. If the broom has any tendency to dislodge aggregate particles bedded in the primerbinder or binder, the Contractor shall defer or eliminate the drag brooming.</p>  | <p><b>Brooming of Surface</b></p>           |
| <p>8. Backrolling shall then be carried out for a minimum period of one hour per roller per 1000 square metres sprayed.</p>  | <p><b>Backrolling</b></p>                   |
| <p>9. Where a bituminous surfacing is specified with separate applications of coarse and fine aggregate on a single application of binder, the coarse aggregate shall be applied first, rolled and any necessary brooming carried out as described above, before application of the fine aggregate and its subsequent rolling and brooming. In this case, the time limits for incorporation of aggregate (paragraph 1 above) shall apply only to the application of the coarse aggregate. The application of fine aggregate will proceed in any case as soon as possible after satisfactory application and embedment of the coarse aggregate.</p> | <p><b>Two Aggregate Application</b></p>     |
| <p>10. When the aggregate has been evenly spread and embedded in the binder, any remaining loose particles of aggregate shall be removed from the pavement not prior to two days and not later than ten days after sealing.</p>  | <p><b>Removal of Loose Particles</b></p>    |

**C244.21 PROTECTION OF SERVICES AND ROAD FIXTURES**

- |   |   |
|---|---|
| <p>1. The Contractor shall take all necessary precautions to prevent primer, primerbinder, binder, aggregate or other material used on the work from entering or adhering to gratings, hydrants or valve boxes, manhole covers, kerb and gutter, bridge or culvert decks and other road fixtures.</p> | <p><b>Contractor's Responsibility</b></p> |
| <p>2. Immediately after aggregate has been spread over the binder, the Contractor shall clean off or remove any sprayed surfacing material and leave the services and road fixtures in a condition equivalent to that existing when the Contractor commenced the sprayed surfacing work.</p>          | <p><b>Services and Road Fixtures</b></p>  |

**NON-CONFORMANCE OF MATERIALS AND WORK**

**C244.22 GENERAL**

- |  |  |
|--|--|
| <p>1. Non conforming materials and work shall be rejected.</p> | <p><b>Replace or Correct Non-conformance</b></p> |
|--|--|

**LIMITS AND TOLERANCES**

**C244.29 SUMMARY OF LIMITS AND TOLERANCES**

1. The limits and tolerances applicable to the various clauses in this Specification are summarised in Table C244.2 below:

| <b>Item</b> | <b>Activity</b>                          | <b>Limits/Tolerances</b>  | <b>Spec Clause</b> |
|-------------|--|---|--------------------|
| 1.          | Design of Bituminous Surfacing           | Contractor to provide details of design to Council's Development Engineer at least seven days before proposed commencement of work  | C244.08            |
| 2.          | Sweeping of Pavement Surface             | Sweeping shall extend at least 300mm beyond each edge of the area to be sprayed   | C244.12            |
| 3.          | <b>Bitumen Heating</b>                   |   |                    |
|             | (a) Bitumen Temperature                  | When incorporated with cutter oil, bitumen shall be in temperature ranges as per Table C244.1.  | C244.14            |
|             | (b) Refinery Cutback Bitumen Temperature | At the time of spraying shall be in temperature range as per Table C244.1.  | C244.14            |
|             | (c) Overheating of Bitumen               | Bituminous material shall not be heated above the upper temperature limits of Table C244.1. Overheated material shall be rejected.  | C244.14            |
|             | (d) Retention of Temperature             | Bituminous materials shall not be held at temperatures within the ranges of Table C244.1 for periods in excess of 10 hours.   | C244.14            |
| 4.          | <b>Spraying Temperature</b>              |   |                    |
|             | (a) Pavement Temperature                 | Bituminous surfacing shall not be undertaken if the pavement temperature has not been at or above temperatures given in Table C244.1 for at least one hour before commencement of spraying. | C244.15            |
| 5.          | 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 20 minutes.  | C244.16            |
| 6.          | Bituminous Adhesion Agent                | Circulation of bituminous adhesion agent with hot bitumen shall be at the rate of 700 litres per minute for 15 minutes.   | C244.16            |

| <b>Item</b> | <b>Activity</b>                           | <b>Limits/Tolerances</b>   | <b>Spec Clause</b> |
|-------------|---|--|--------------------|
| 7.          | <b>Application of Bituminous Material</b> |  |                    |
|             | (a) Spray Area                            | Area to be sprayed shall be limited to area that can be covered by aggregate at target application rate within 15 minutes of spraying.   | C244.17            |
|             | (b) Application Rates                     | Application rates and quantities shall apply to a temperature of 15°C.   | C244.17            |
|             | (c) Non-conformance                       | Areas not within 5 percent of the target application rate of primer, primerbinder or binder shall constitute 'non-conformance' under the Contract.                                 | C244.17            |
| 8.          | <b>Application of Aggregate</b>           |  |                    |
|             | (a) Spreading Time                        | Application of aggregate shall be completed within 15 minutes of spraying bitumen or cutback bitumen on each section.  | C244.20            |
| 9.          | <b>Rolling</b>                            |  |                    |
|             | (a) Roller Numbers and Type               | Initial rolling shall be carried out with two or more dual axle smooth pneumatic tyred multi-wheeled rollers. Minimum load of one tonne per tyre and minimum tyre pressure 550KPa. | C244.20            |
|             | (b) Backrolling                           | Backrolling shall be undertaken for minimum of one hour per roller per 1000 square metres sprayed.   | C244.20            |

**Table C244.2 - Summary of Limits and Tolerances**

**C244.30 SUMMARY OF APPROVALS & SUBMISSIONS TO COUNCIL'S DEVELOPMENT ENGINEER**

| <b>Activity</b>  | <b>Notice Required</b> | <b>Spec Clause</b> |
|--|------------------------|--------------------|
| Notice of Intention to commence surfacing, with details of spray rates, aggregate size and ALD | Minimum Two days       | C244.09 2.         |
| Approval of the aggregate lot and target application rates                                     | <b>HOLD POINT</b>      | C244.13 3.         |

**Table C244.3**

**ANNEXURE C244A - DETAILS OF WORK**

| <b>Section</b> |           | <b>Prime</b> | <b>Primer Seal</b> |                  | <b>Seal or Reseal</b> |                  |
|----------------|-----------|--------------|--------------------|------------------|-----------------------|------------------|
| <b>From</b>    | <b>To</b> |              | <b>Binder</b>      | <b>Aggregate</b> | <b>Binder</b>         | <b>Aggregate</b> |
|                |           |              |                    |                  |                       |                  |