

TRANSPORT FOR NSW (TfNSW)

QA SPECIFICATION TfNSW M212

ROUTING AND SEALING OF CRACKS (CONCRETE PAVEMENT)

NOTICE

This document is a Transport for NSW QA Specification. It has been developed for use with roadworks and bridgeworks contracts let by Transport for NSW or by local councils in NSW. It is not suitable for any other purpose and must not be used for any other purpose or in any other context.

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REVISION REGISTER

Ed / Rev Number	Clause Number	Description of Revision	Authorised By	Date
M215				
Ed 1 / Rev 0		First edition	GM, RNIC	12/05/04
Ed 1 / Rev 1	Notes & 1 Foreword	New clause re Intended use added New Foreword	GM, IC	30.08.07
Ed 1 / Rev 2	Most	Format corrected	GM, IC	24.10.07
M212				
Ed 2 / Rev 0	All Clause 5.3 Annexure A	To match new Maintenance Activities: <ul style="list-style-type: none">• Changed number• Changed Pay Items• Changed references to other similarly changed specifications Removed Deduction mechanisms Changed internal referencing format Added clause re Accomplishment reporting Reduced default warranty from 12 months to 6 months.	GM, IC	05.08.08
Ed 3 / Rev 0	All	General technical review, and revision of some technical requirements. Format revised.	GM, IAM	17.04.13
Ed 3/Rev 1	Global	References to “Roads and Maritime Services” or “RMS” changed to “Transport for NSW” or “TfNSW” respectively.	DCS	22.06.20

<p style="text-align: center;">GUIDE NOTES (Not Part of Contract Document)</p>

THESE NOTES ARE NOT PART OF THE SPECIFICATION, CONTRACT OR AGREEMENT.

The following notes are intended to provide guidance to TfNSW personnel on the application of the Specification. They do not form part of the Specification, Contract or Agreement.

USING TfNSW M212

This specification has been specifically developed for TfNSW maintenance works. It must not be used without a review of its suitability for the application and in the contractual environment.

It is a QA specification. The use of QA specifications requires the implementation of a quality system by the service provider which meets the quality system requirements specified in TfNSW Q.

EDITION 3

LIMITATIONS OF WORK

This Specification is specifically for the routing and sealing of cracks in concrete pavements as a combined activity. It does not cover sealing only as a single activity.

It does not include treatment of joints, however formed, as these will generally be straight and preparation will involve sawing rather than routing. Cracks will generally not be straight and therefore use of saws is not appropriate. Maintenance of joints is covered by M214.

ROUTING WIDTHS AND SEALING DETAILS

Table 1 sets out the treatments to be used for different crack widths. These details are generally in accordance with the TfNSW Rigid Pavement Standard Details – Maintenance drawings.

Attention is drawn to the need to distinguish between different environments for routing and sealing of cracks in which different crack sealing treatments may be required. For example, a concrete pavement through a suburban shopping centre in which a great number of pedestrian movements would be expected as pedestrians cross the road may need to be considered differently to a concrete pavement that forms part of a highway which experiences little or no pedestrian traffic.

DETAILS OF WORK

Annexure A sets out a generally suitable format for detailing the work required by location and estimated lengths of cracks of each nominal width provided for in this Specification. Provision is also included for referencing slab maps or sketch plans where considered necessary.

The detail provided in Annexure A must be adequate to fully define the work required.

Where the width of cracking is less than 1 mm and the surface arris is not spalled, routing and sealing is not required unless otherwise directed.

GENERAL

Polyurethane should be substituted for silicone sealant in the 18 mm nominal width where distillate fuels are likely to be in concentration.

The sealant acts as a sealant only and joint movement by virtue of cross stitching is small in comparison to transverse contraction joints. Dimensions are therefore at variance to transverse contraction joints.

Tooling assists the sealant to adhere to the routed concrete walls, with the concave depression reducing the wear and loads on the sealant.

CUSTOMISING THE SPECIFICATION

In addition to scheduling work details, ensure that a warranty period is defined, and that trial work is specified where that is considered necessary.

The technical treatment details should be examined in depth before issuing the Specification.

Any changes considered warranted by local circumstances should be dealt with by making project specific changes to the Specification.



ROUTING AND SEALING OF CRACKS (CONCRETE PAVEMENT)

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VERSION FOR: DATE:

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FOREWORD

TFNSW COPYRIGHT AND USE OF THIS DOCUMENT

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When this document forms part of a contract

This document should be read with all the documents forming the Contract.

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REVISIONS TO PREVIOUS VERSION

This document has been revised from Specification TfNSW M212 Edition 3 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 have been 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 TfNSW M212

ROUTING AND SEALING OF CRACKS (CONCRETE PAVEMENT)

1 GENERAL

- | | | |
|-----|---|--------------------------------|
| 1.1 | This Specification has been developed specifically for TfNSW maintenance works. It must not be used in any type of contract without consideration of its suitability in the prevailing circumstances. | Intended use |
| 1.2 | The work to be executed under this Specification includes the ROUTING of full depth CRACKS in BASE CONCRETE so as to form a RESERVOIR for a sealant, the removal of existing defective sealants where present, and the cleaning, priming and installation of a cast insitu sealant into the ROUTED RESERVOIR.

The ROUTING is not full depth and provides vertical, parallel sides to the CRACK which may be spalled, splayed and/or irregular. | Scope |
| 1.3 | Some words or abbreviations have a special meaning in this Specification. They are explained in Annexure M212/M. These words are highlighted in capitals eg DEFINED TEXT. | Definitions |
| 1.4 | The standards, specifications and test methods referred to by this Specification are referenced using an abbreviated form (eg AS 1478). The titles are given in Annexure M212/M. | Referenced documents |
| 1.5 | Unless otherwise specified, the issue of an Australian Standard, TfNSW Test Method or referenced TfNSW specification to be used is the issue current one week before closing date for pricing the work. | Applicable issue |
| 1.6 | Details of work to be carried out under this Specification are described in Annexure M212/A. | Details of work |
| 1.7 | Payment for the activities associated with completing the work detailed under this Specification must be made using the Pay Item(s) referred to in Annexure M212/B. | Measurement and payment |
| 1.8 | YOU must provide all responsibilities, such as actions, works, supply of materials, unless specifically stated otherwise. Accordingly, this Specification does not generally use wording such as "YOU shall ..." or "YOU must ..." because this is the underlying requirement. However, it is used where actions in a clause involve both YOU and the PRINCIPAL and the roles need to be unambiguous. | Interpretation |
| 1.9 | Provide the identified records specified in the TfNSW Quality Management System Specification included in the Contract Documents (TfNSW Q) and summarised in Annexure M212/C.2. | Records |

2 PLANNING

2.1 PROJECT QUALITY PLAN REQUIREMENTS

- 2.1.1 The requirements of the PROJECT QUALITY PLAN are defined in TfNSW Q. In addition, the PROJECT QUALITY PLAN must:
- .1 Address the HOLD POINTS and WITNESS POINTS required by this Specification and summarised in Annexure M212/C1. The PRINCIPAL will consider the submitted documents before authorising the release of any HOLD POINT. **Hold Points and Witness Points**
 - .2 Address each of the construction process requirements in this Specification and summarised in Annexure M212/D1. **Construction process**
 - .3 Include the manufacturers' requirements for the storage, handling, application and installation of all materials proposed for use. **Manufacturers' requirements**
 - .4 Include Safety Data Sheets and manufacturers' material specifications. **Material**
 - .5 Include a requirement for the routine submission of data which will certify conformity of all work and materials to the requirements of this Specification and include supporting documentation. **Conformity data**

<p>2.1.2 Process Held: Commencement of work</p> <p>Submission: Submit the PROJECT QUALITY PLAN at least 5 BUSINESS DAYS before proposed commencement of work.</p> <p>Release of Hold Point: The PRINCIPAL will consider the submitted documents before authorising the release of the HOLD POINT.</p>	<p>HOLD POINT</p>
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2.2 LOCATION AND WIDTH OF ROUTING

- 2.2.1 Indicative details of CRACKS to be treated are referenced in Annexure M212/A. **General location**

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- 2.2.2 Mark on-site the CRACKS that are to be ROUTED and sealed. Prior to the commencement of ROUTING, measure the CRACK openings taking into account the 85 percentile aris spall width to determine the required ROUTING width. This is defined for each CRACK as the width applicable to 85% of the total length of that CRACK. A long CRACK of variable width may be sub-divided into smaller sections of similar width.

Location and nominal widths of routing

The ROUTING widths and depths are determined from a combination of CRACK and spall widths as detailed in the Series MP Drawings referenced in Annexure M212/M and summarised in Table 1.

- 2.2.3 Treatment type, material finishing, shaping requirements, and placement configurations must be determined in accordance with Table 1.

Treatment Type

- 2.2.4 **Process Witnessed:** Marking of CRACK locations and definition of ROUTING widths.

WITNESS POINT

Submission: YOU must provide 2 BUSINESS DAYS notice of the work mark-out.

Table 1 Routing Widths and Sealing Details

Nominal Rout Width and Tolerance (mm)	Sealant Type	Rout Depth (range in mm)	Closed-cell Polyethylene Backer Rod Diameter and Shape	Sealant thickness (range in mm)	Sealant Surface Tooled Depression (range in mm below the pavement surface)
15±3	Silicone	15 - 20	15 -20 mm, slit to ½ round	7 - 10,	3 - 5
30±5	Polyurethane	30 - 37	30 - 40 mm, slit to ½ round	10 - 15	3 - 5
50±7	Polyurethane	30 - 37	50 - 60 mm, slit segment with height of 14mm	11 - 16	4 - 6
9 ±3	Hot poured elastomeric	12 - 25	Not applicable	12 - 25	0 - 5

- Notes:
- 1 The nominal ROUTING width must be the lowest of the above ROUTING widths which exceeds the typical CRACK/JOINT width plus the 85th percentile spalled width.
 - 2 Where the width of CRACKING is less than 1 mm and the surface aris is not spalled, ROUTING and sealing is not required unless otherwise directed.
 - 3 Polyurethane will be substituted for silicone sealant in the 15 mm nominal width where distillate fuels are likely to be in concentration.

- 4 The Schedule of Quantities provides an approximate split of the total length of work between the three nominal ROUT and seal widths. The actual width category is to be determined by YOU; Clause 2.2 refers.
- 5 Those sections of spalling which exceed the nominal ROUTED width are to be ROUTED by a second pass of the router on one edge locally so as to provide vertical faces to both sides of the spill.
- 6 The use of hot poured elastomeric material is subject to the approval of the Principal.

2.3 METHOD OF WORKING

2.3.1 Include in the PROJECT QUALITY PLAN a detailed description of all equipment and proposed construction methods to be used in executing the works under this Specification. **Construction method**

2.3.2 Where specified in Annexure A, carry out a PLACEMENT TRIAL. **PLACEMENT TRIAL**

The PLACEMENT TRIAL section must comprise one day's production and be at least 100 m in length. Each nominated treatment is subject to a separate PLACEMENT TRIAL and the location of each trial is subject to the agreement of the PRINCIPAL.

The PRINCIPAL may direct an additional PLACEMENT TRIAL when there is any change in materials or operating methods.

Inspect the work on completion of the PLACEMENT TRIAL to ensure that the work complies with the requirements of this Specification.

Every successful PLACEMENT TRIAL becomes part of the permanent Work.

2.3.3 **Process Held:** PLACEMENT TRIAL work (when specified). **HOLD POINT**

Submission: Provide 2 BUSINESS DAYS notice of proposed commencement and full details of the extent and location of the trial work.

Release of Hold Point: The PRINCIPAL will consider the submitted documents before authorising the release of the HOLD POINT.

2.3.4 **Process Held:** Continuation of work following the PLACEMENT TRIAL. **HOLD POINT**

Submission: Verification that the trial work conforms to the requirements of this Specification.

Release of Hold Point: The PRINCIPAL will consider the submitted documents and may inspect the PLACEMENT TRIAL work before authorising the release of the HOLD POINT.

2.3.5 Carry out the work in the order set out in Annexure M212/A. **Order of work**

- 2.3.6 Where CROSS- STITCHING is required, ensure CROSS STITCHING is completed before ROUTING. **Prior works**
- 2.3.7 The PRINCIPAL may direct additional PLACEMENT TRIALS when materials or procedures change, or conformity is not achieved. **Additional PLACEMENT TRIALS**

3 RESOURCES

3.1 SEALANTS

- 3.1.1 Table 1 lists the sealant type for the ROUTED widths. The width of longitudinal silicone applications is limited to 18 mm. **Selection of sealant**

Polyurethane based sealants must be used for widths greater than 18 mm and for areas where distillate fuel oil is likely to be spilt or concentrated.

- 3.1.2 Silicone sealant must be a one-part, cold-applied, designated as highway grade by the manufacturer, UV stable and of concrete grey colour matching the surrounding BASE and must form a permanent bond with the BASE CONCRETE consistent with the service life of the sealant. **Silicone sealant**

Silicone sealant must comply with Table 2.

Table 2

Test Method	Attribute	Requirements
ASTM-D792 (Method A)	Specific gravity	1.1 – 1.55
ASTM-D2240 (Standard Curing)	Durometer hardness	10 – 25
ASTM-C603	Extrusion rate	90 – 250 g/min
ASTM-C679	Tack free time	30 – 70 mins
ASTM-C793	Accelerated weathering	No chalking, cracking, or bond loss at 5000 hours.
ASTM-C794	Adhesion to concrete	Minimum 35N average peel strength.
TfNSW T1193	Accelerated ageing	Conditioning of specimen.
TfNSW T1192	Adhesion to concrete	Conditioning as per TfNSW T1193. Extension to 70%, compression to 50%. Not more than 10% failure over the cross-sectional area.

- 3.1.3 Polyurethane sealant must be a non-sag, heavy duty, one component, smooth, thixotropic paste, designated as highway grade by the manufacturer, UV stable, and of concrete grey colour matching the surrounding BASE and must form a permanent bond with the BASE CONCRETE consistent with the service life of the sealant. **Polyurethane sealant**
- 3.1.4 Hot poured elastomeric joint sealant must comply with TfNSW 3263. **Hot poured elastomeric sealant**

3.1.5	Keep on site the relevant technical data for the sealant which correlates ambient temperatures with the minimum time for the sealant to form a skin and be of sufficient cure so that the tyre action of vehicles will not distort the sealant nor cause it to change colour.	Curing time
3.1.6	All sealants must be stored in accordance with the manufacturer's written instructions.	Storage
3.1.7	Sealant components must be of sufficient colour difference to allow visual assessment of the sealant being fully mixed. Splitting or partial use of a pre-packaged dosage is not permitted.	Colour of components
3.1.8	Prior to commencement of work, obtain for each sealant proposed to be used, written confirmation from the material manufacturer that the sealant meets all the requirements set out in this Specification.	General
3.1.9	Include details in the PROJECT QUALITY PLAN that demonstrate the suitability of the sealant by providing evidence of its previous successful use. The previous use must be for repairing concrete pavement and being subjected to dynamic wheel loads from vehicular traffic.	Demonstrate suitability of materials
3.2 OTHER MATERIALS		
3.2.1	Where the sealant manufacturer recommends use of a primer, the primer material used must comply with the manufacturer's recommendations and must be compatible with the sealant.	Primer
3.2.2	Any backer rod used must be compatible with the sealant and this must be confirmed in writing by the sealant manufacturer. The backer rod must be continuous closed-cell polyethylene.	Backer rod
3.2.3	Any filler materials used must be compatible with the sealant and this must be confirmed in writing by the sealant manufacturer. The filler must comply with TfNSW 3204.	Filler
3.2.4	All blinding materials to be used must be acceptable to the sealant manufacturer for emergency surface blinding of the sealant when it is tacky and the travel lane is to be re-opened because of traffic volumes or delays. Where used, blinding material must have no detrimental effect on the sealed crack. Describe the procedures, materials and application rates for blinding in the PROJECT QUALITY PLAN.	Blinding
3.2.5	Include details in the PROJECT QUALITY PLAN that demonstrate the suitability of the other materials by providing evidence of their previous successful use. The previous use must be for repairing concrete pavement and being subjected to dynamic wheel loads from vehicular traffic.	Demonstrate suitability of materials

3.3 EQUIPMENT

- | | | |
|-------|---|---------------------------------------|
| 3.3.1 | The equipment to be used for ROUTING the CRACKS must be capable of following the CRACK accurately such that both sides of the CRACK are made vertical over the nominated depth and so that fresh concrete faces are exposed on both sides in one pass, with the exception of the second pass required on one face as detailed in Table 1 (Note 5). The ROUTING must create parallel arrises without excessive spalling. | Capable of following the crack |
| 3.3.2 | The router’s cutting bit must be mounted on a vertical rotating shaft, with or without a vertical oscillating action, which is either manually pushed or self propelled along the CRACK at a pre-set depth. | Router’s cutting bit |
| 3.3.3 | The router must operate in a manner and be fitted with appropriate shields such that there is no flying debris and the amount of air-borne dust and siliceous material is kept to a minimum. | Shields |
| 3.3.4 | Routers with a horizontal rotating shaft and concrete saws are not permitted to be used. | Unacceptable Routers |

4 EXECUTION

4.1 PROTECTION OF WORK

- | | | |
|-------|--|---|
| 4.1.1 | ROUTED CRACKS are not permitted to be trafficked before being sealed.

During each shift, ROUT only that length of CRACK that can be cleaned, prepared, sealed and cured before opening to traffic in the same shift. | Programming work |
| 4.1.2 | Take all necessary precautions to protect the work until the sealants have developed sufficient strength to carry traffic without damage to the work. Comply with the manufacturer’s data regarding the curing time at the prevailing temperature and relative humidity. | Curing |
| 4.1.3 | There must be on-site materials acceptable to the sealant’s manufacturer for emergency surface blinding of the sealant when the sealant is tacky and the travel lane is to be re-opened because of traffic volumes and delays. | On-site materials for emergency “blinding” |
| 4.1.4 | Where the lane is to be reopened because of slower progress of work or for unexpected traffic conditions, blind the sealant with material in accordance with Clause 3.2.3 and repair any damage to the sealant due to the actions of traffic. YOU will bear cost of this work. | Blinding |

4.2 ROUTING

- | | | |
|-------|---|---|
| 4.2.1 | Where a wet ROUTING process is used, work must proceed for each shift from the high side of the combined crossfall and longitudinal grade and proceed to the low side so as to avoid contamination of cleaned RESERVOIRS. | Wet routing process |
| 4.2.2 | Remove the bulk of the detritus on the surface of the BASE CONCRETE and in the ROUTED RESERVOIR in conjunction with the ROUTING process by sweeping and/or vacuuming. Air lancing is not permitted until the bulk of the loose material has been removed. | Remove detritus from base concrete |
| 4.2.3 | YOUR attention is drawn to the likely presence of tie-bars, dowels, mesh and other steel products in PCP, CRCP, JRCP and SFCP which may affect the progress of ROUTING and the wear rates of bits. No additional payment will be made due to the presence of any steel encountered. | Likely presence of steel |
| 4.2.4 | Spalling caused by the ROUTING process must be re-ROUTED on the affected arris to create the required vertical face, provided the affected length does not exceed 500 mm. The sealant for the nominated width may be used. No additional payment for the over-width ROUTING to correct spalling will be made. | Spalling less than 500 mm |
| 4.2.5 | Where the router is causing excessive spalling, modify the construction methods or equipment to minimise spalling. No additional payment will be made for any equipment modification found necessary. Where the ROUTING causes micro-cracking, repair by in accordance with TfNSW M215. | Excessive spalling |
| 4.2.6 | Where the ROUTING process results in a spalled length in excess of 500 mm or where there is a series of lengths less than 500 mm each, the CRACK is to be re-ROUTED using a larger bit to create the required parallel arrises. Payment for this work will be made at the nominal width. | Spalling greater than 500 mm |

4.3 CLEANING OF ROUTED RESERVOIRS AND CRACKS

- | | | |
|-------|---|-----------------------------|
| 4.3.1 | The ROUTED RESERVOIR must be free from all loose detritus, pulverised concrete and other material which may have a deleterious effect on the adhesion of the sealant to the ROUTED concrete faces. Grit blasting is not required when the ROUTED concrete faces have been prepared in accordance with this Specification. | General |
| 4.3.2 | For RESERVOIRS ROUTED by a dry process where the concrete is dry, cleaning must be achieved by methods employing the use of a vacuum and assisted by brushes where necessary followed by air lancing where necessary to achieve clean faces. | Cleaning dry Routing |

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|-------|--|---|
| 4.3.3 | Where a wet ROUTING process is used or the concrete is wet, cleaning must be achieved by methods incorporating the use of a liquid or liquid/air jet at a sufficiently high pressure and assisted by brushes where necessary. Gravity fed liquid from tanks is not permitted. Compressed air must be oil-free. | Cleaning wet Routing |
| 4.3.4 | The material in the CRACK that can not be dislodged by flushing will be deemed to be sufficiently stable to remain. | Material that can not be dislodged |
| 4.3.5 | Maintain the cleaned RESERVOIR until the backer rod (if used), primer (if used), and sealant are installed. | Maintain clean reservoir |

4.4 INSTALLATION OF SEALANT

- | | | |
|-------|--|---|
| 4.4.1 | Installation must be in accordance with the manufacturer's recommendations including pavement temperature and surface preparation. | Manufacturer's recommendations |
| 4.4.2 | Install the sealant only when the side walls of the ROUTED RESERVOIR have been thoroughly cleaned. Do not install sealant when the concrete is damp or wet. | Ensure routed reservoir is clean |
| 4.4.3 | Prime the CRACK in accordance with the recommendations of the sealant manufacturer. | Prime the crack |
| 4.4.4 | Immediately following cleaning of the RESERVOIR, insert into the RESERVOIR a continuous half-round closed-cell polyethylene backer rod if specified in Table 1. The backer rod is to be accurately slit in a jig to the required shape. Depress the backer rod to the bottom of the RESERVOIR with the cut side of the backer rod face down so as to seal the exposed CRACK. | Insert backer rod |
| 4.4.5 | When necessary, hold the backer rod in place by a suitable flexible adhesive such that the rod will not be dislodged with the actions of wind or placement/tooling of the sealant. If the backer rod is damaged in any way, replace the damaged section. | Hold the backer rod in place |
| 4.4.6 | Immediately prior to introducing the sealant into the groove, clean any foreign or disturbed material from the opening and from the top of the backer rod by dry oil-free air jet or by vacuum. | Clean top of backer rod |
| 4.4.7 | Introduce the silicone sealant into the RESERVOIR by mechanical means, and tool with a specially shaped tool or appropriate oversize backer rod so as to achieve the required upper surface shape and bonding to the vertical faces of the ROUTED RESERVOIR. | Installation of Silicone Sealant |

Extend the sealant down the free vertical edges of the BASE to prevent the ingress of incompressible material into the opening.

- 4.4.8 Mix polyurethane sealant components from pre-packed dosages prepared by the manufacturer. Splitting or partial use of a pre-packed dosage is not permitted. Where the sealant is mixed using drills powered by a 240 volt supply, earth leakage devices must be used.
- Mixing
Polyurethane
Sealant**
- Ensure that the sealant to be placed in the RESERVOIR is thoroughly mixed and has not started to gel.
- 4.4.9 Introduce the sealant into the RESERVOIR by gunning and tool with a specially shaped tool or appropriate oversize backer rod so as to achieve the required upper surface shape and bonding to the vertical faces of the ROUTED RESERVOIR. Installing of the sealant by spatulas and the like is not permitted. Spatulas are acceptable for use in trimming and removing excess sealant.
- Installation of
Polyurethane
Sealant**
- Extend the sealant down the free vertical edges of the BASE to prevent the entry of incompressible material into the opening. The dimension of the installed sealant and backer rod must be as detailed in Table 1.
- 4.4.10 Inspect the work on completion to ensure that the work complies with the requirements of this Specification.
- Final inspection of
work**
- 4.5 CLEANING UP**
- Remove all wastes from operations from site and dispose of in accordance with TfNSW G36.
- 4.6 DAILY WORK RECORD**
- Maintain a daily record of all work by recording at the end of each shift details of all work accomplished. This daily record must include start and finish chainages, and lengths of completed ROUTING and sealing for each width type.
- YOU must sign the daily record which will form the basis for measurement and payment. The daily record must conform to Annexure M212/E.

5 CONFORMITY

5.1 CERTIFICATION OF CONFORMITY

Submit a conformity summary report for all work done and provide any necessary supporting documentation. This report will certify conformity of all work and materials to the requirements of this Specification.

Conformity Summary

The activities in Table 3 must be included in the summary.

Table 3

Activity	Reference Clause	Conformity
Record of work detail and routing widths	2.2.4	Schedule of work provided to Principal
Material Conformity	3.1 and 3.2	Manufacturer's certification received
Routing	4.2	Certification of conformity
Cleaning	4.3	Certification of conformity
Installation of sealant	4.4	Certification of conformity
Cleaning up	4.5	Certification of conformity
Nonconformities	TfNSW Q	List of NCR's issued and dispositions

5.2 WARRANTY PERIOD

YOU warrant the work for the period set out in Annexure A. The PRINCIPAL will inspect the work at the end of that period. Any failure of the sealant or adhesion of the sealant to the concrete is deemed to be a nonconformity and must be repaired within one month. For any defect repair, the warranty period will recommence from the date of the repair.

5.3 ACCOMPLISHMENT REPORTING

The accomplishment of conforming work must be reported as specified in Table 4.

Table 4

Code	Description	Unit of Measure	Accomplishment Reporting
212	Routing and Sealing Cracks (Concrete Pavement)	m ²	Report total area of lane where treatment occurs (length treated multiplied by lane width).

ANNEXURE M212/A – DETAILS OF WORK

Road	Segment	C/way	Lane	Start	End	Slab ID	Type (T)rans or (L)ong	Nominal Length (m) For each Nominal Routing Width		
								20 mm	30 mm	50 mm

Slab maps/sketch plans attached:	YES / NO	("Yes" unless specified otherwise)
PLACEMENT TRIAL required:	YES / NO	("Yes" unless specified otherwise)
Warranty Period:		("6 months" unless specified otherwise)

ANNEXURE M212/B – MEASUREMENT AND PAYMENT**B1 GENERAL**

B1.1	Pay items are identified in Annexure M212/B.2.	Pay Items to be used
B1.2	The price(s) of pay items with a quantity of work in the schedule must be costed and make due allowance for the cost of the activity. Any pay item with a quantity of work that is not priced is understood to be included in other priced pay items.	Prices
B1.3	Any overheads must be distributed between pay items.	Overheads
B1.4	Pay items with a quantity of work specified must not be tendered as a lump sum price.	No Lump Sum
B1.5	Measurement will include a PLACEMENT TRIAL (refer Clause 2.3.2, which forms part of the work detailed in Annexure M212/A and conforms to this Specification.	Trial pavement
B1.6	The Contractor is not paid for events that include: <ul style="list-style-type: none"> • Removing and replacing nonconforming material with conforming material. • Rework required to achieve conformity. 	No payment

B2 SCHEDULE OF PAY ITEMS

Pay Item *	Item Name and Description	Units **
Note: The work includes the routing, cleaning, sealing of cracks and additional work and sealant resulting from the second pass of the router – no separate payment will be made for these.		
M212P1	Routing and Sealing of Cracks in Concrete Pavement	m²
M212P1.1	Routing and sealing of cracks – crack width less than 20 mm	m ²
M212P1.2	Routing and sealing of cracks – crack width 20 to 35 mm	m ²
M212P1.3	Routing and sealing of cracks – crack width greater than 35 mm	m ²

** Claim total area of lane where complying treatment occurs (length treated multiplied by lane width).

Continued overleaf

M212P2	Establishment	Item
	<p>Note: It is taken that you have included all the following in tendering your establishment rate - no further payment will be made for them:</p> <ul style="list-style-type: none"> • Plant float to/from the site or project; • Set up and removal of site facilities (eg: office, sheds, toilets); Principals facilities (if required, • Initial travel to site or project; • Daily travel to/from site or project; • Accommodation (eg: on site or motel/hotel). 	<p>Establishment is paid once per Work Order.</p>
<p>* Pay Items are primarily for guidance in preparing Work Orders (which can be Lump Sum or Schedule of Rates). When preparing a Work Order, any or all of the Pay Items may be incorporated: the aim is to improve the accuracy of the Service Provider’s estimation and pricing by:</p> <ul style="list-style-type: none"> a) selecting those Pay Items which denote the activities that are to be undertaken and b) requiring the Service Provider to estimate and price each Pay Item individually. <p>When Establishment is a significant cost, the Pay Item specific to it must be incorporated in the Work Order – the cost must not be amortised / absorbed across the other Pay Items.</p> <p>Similarly, when Traffic Control is a significant cost, its Pay Item(s) must be incorporated. See TfNSW G10M for a list of these.</p>		

ANNEXURE M212/C – SCHEDULES OF HOLD POINTS, WITNESS POINTS AND IDENTIFIED RECORDS

C1 SCHEDULE OF HOLD POINTS AND WITNESS POINTS

Reference	Type	Process Held or Witnessed	Submission Details
TfNSW Q and Clause 2.1.2	Hold Point	Commencement of works	Contractors PROJECT QUALITY PLAN assessed and audit procedure established to ensure conformity with this Specification in the absence of frequent testing and supervision by the PRINCIPAL.
Clause 2.2.4	Witness Point	Marking of crack locations and routing widths	Provide notice of work mark-out and a schedule of ROUTING widths 2 BUSINESS DAYS prior to commencement of work.
Clause 2.3.3	Hold Point	Placement Trial work	Provide 2 BUSINESS DAYS notice of commencement of trial and full details of trial.
Clause 2.3.4	Hold Point	Continuation of work following the Placement Trial	Provide conformity data on trial in conformity with Clause 5.

C2 SCHEDULE OF IDENTIFIED RECORDS

Reference	Description of Identified Record
Clause 2.1	PROJECT QUALITY PLAN

ANNEXURE M212/D – PLANNING DOCUMENTS

D1 CONSTRUCTION PROCESSES

Reference	Process	Details
Clause 2.3.1	Construction methods and equipment	Detailed description
Clauses 3.1 and 3.2	Materials	Manufacturer's requirements for the storage, handling, and use of all materials Safety Data Sheets Procedures, materials, and application rates for blinding Demonstrate suitability of the materials by providing evidence of their previous successful use
Clause 4.1	Protection of works	Methods and equipment for emergency blinding when necessary to protect works and prevent or repair damage.
Clause 4.2	Routing	Methods and equipment for ROUTING CRACKS.
Clause 4.3	Cleaning	Methods and equipment for cleaning CRACKS prior to installing sealants.
Clause 4.4	Installation of sealant	Methods and equipment for installing each type of sealant.
Clause 4.5	Cleaning up	Methods for cleaning up after completion of work.
Clause 4.6	Daily Work Record	Detail of method for measuring and recording work accomplishment.
TfNSW Q and Clause 5	Process Conformity	Provision of Inspection and Test Plan to indicate conformity to the requirements of Clause 5.1.

ANNEXURE M212/E – DAILY WORK RECORD

Contract No.		Date:		Certification:		Position:	
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Note: Certification of this record indicates that the listed works have been carried out in accordance with all the requirements specified in TfNSW M212

Road	Segment	C/way	Lane	Start	End	Slab ID	Type (T)rans. or (L)ong	Nominal Length (m) For each Nominal Routing Width			Comment
								20 mm	30 mm	50 mm	

ANNEXURES M212/F TO M212/L – (NOT USED)

ANNEXURE M212/M – REFERENCED DOCUMENTS AND DEFINITIONS

M.1 REFERENCED DOCUMENTS

M.1.1 TfNSW Documents

TfNSW G10M	Traffic Management (Maintenance Works)
TfNSW G36	Environmental Protection
TfNSW Q	Quality Management System
TfNSW M215	Repair of Surface Spalls in Concrete Pavement
TfNSW 3204	Preformed Joint Fillers for Concrete Pavements and Structures
TfNSW 3263	Hot Poured Elastomeric Joint Sealant for Roads
Series MP	Rigid Pavement Standard Details – Maintenance, Plain Concrete Pavement

M.2 DEFINITIONS

BASE CONCRETE	The upper (structural) layer of concrete with varying insitu strengths, typically 25 to 50 MPa. The concrete contains various forms of steel reinforcement, dowels and tiebars. In some instances the concrete may contain steel-fibre reinforcement.
CRACK	An irregular, unplanned opening in BASE CONCRETE which is essentially vertical and of various widths and which may intersect with others, orientated longitudinally (viz, in the direction of traffic), transversely or a combination. The CRACK may be straight or meandering and may have arris spalling.
CROSS STITCH	A process of drilling alternately inclined holes into concrete across a CRACK or JOINT and affixing a tiebar for the purposes of tying adjacent concrete faces to prevent JOINT/CRACK from further widening.
JOINT	A planned JOINT in BASE CONCRETE which runs either parallel (in the case of longitudinal JOINTS) or transverse to the direction of traffic flow. They are either formed or induced.
PLACEMENT TRIAL	A trial section of routing and sealing of cracks that includes the nominated materials, equipment, and construction methods to be used in executing the works under this Specification.
PROJECT QUALITY PLAN	The requirements of the PROJECT QUALITY PLAN are defined in TfNSW Q.
RESERVOIR	A uniform rectangular crack channel resulting from ROUTING operations.
ROUTING	A mechanical process where a cutting bit is mounted on a vertical rotating shaft, with or without a vertical oscillating action, which is manually pushed or self propelled along the CRACK at a pre-set depth to form a surface RESERVOIR in the BASE CONCRETE for the purposes of installing a sealant.

LAST PAGE