

TRANSPORT FOR NSW (TfNSW)

QA SPECIFICATION R75

**INSITU PAVEMENT STABILISATION
USING SLOW SETTING BINDERS**

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REVISION REGISTER

Ed/Rev Number	Clause Number	Description of Revision	Authorised By	Date
Ed 1/Rev 0		First issued.	GM, RNIC	31.01.02
Ed 1/Rev 1	1.2 3.2.3.1, 3.2.3.2, Annex 2 4.2, 4.4, 4.5, Annex 3, Annex 6 4.3 Annex 6	References updated. References to RTA 3053, RTA 3054 replaced by RTA 3211. Reference to RTA 3052 deleted. References to RTA specifications updated. Reference document for identified records updated.	GM, IC	11.10.10
Ed 2/Rev 0	Global Guide Notes 1.3.1, 4.2 2.2 2.3	New Edition. Title of specification changed. "RTA" changed to "RMS". Clauses rearranged and reworded to improve clarity. New clause headings added. "Superintendent" changed to "Principal". Technical Reference Notes section deleted. Test Method for determining Working Times for maximum dry density and for unconfined compressive strength updated to T147. MTBB to comply with spec 3051. Requirements for materials at certified stockpiles elaborated.	GM, IC (M Andrew)	15.03.12

Ed/Rev Number	Clause Number	Description of Revision	Authorised By	Date
Ed 2/Rev 0 (cont'd)	2.4	Requirement for site stockpiles to be certified added.		
	3.1	Binders to comply with spec 3211.		
	4.2	New clause on design requirements added.		
	4.4	New clause on mix design nominated by the Contractor added.		
	6.5	Tolerance for binder proportions specified. Sampling to comply with spec 3211.		
	6.6.2	Requirements added for determination and submission of Design Target Spread Rate of binder. Method of obtaining Field Target Spread Rate specified.		
	6.6.3	New clause on spillage of binder added.		
	6.6.4	Requirement to spread extra binder where achieved spread rate is less than 95% of Field Target Spread Rate added.		
	6.8.1	Hold Point added.		
	6.8.4	New clause on stabilisation adjacent to joints added.		
	6.10	Timing requirement for trimming added.		
	6.12	Drainage and traffic diversion requirements added.		
	6.13	Reference to spec R107 added.		
	7.3	New clause on survey for thickness added.		
	8.3	Requirements on binder application rate expanded.		
	8.4.1	Depth of and timing of carrying out insitu density testing specified. Requirements covered in Test Method T173 deleted.		
	8.4.3	Relative compaction value for pavement course ≤ 250 mm thick changed from "100%" to "102%".		
	8.5	Thickness tolerance amended.		
	8.6	Surface level tolerance after primary trimming deleted. Surface level tolerance after final trimming amended.		
8.7	New clause on surface deviation added.			
8.8	"RTA T187" changed to "RTA T188". Equivalent IRI _s to NAASRA roughness counts added.			

Ed/Rev Number	Clause Number	Description of Revision	Authorised By	Date
Ed 2/Rev 0 (cont'd)	8.10	New clause on Certificate of Conformity added.		
	8.11	Previous clause prohibiting reworking of rejected Lots deleted.		
	Annex B1	General description amended; note added that payment for removal of existing wearing surface to be made under other specs. Pay Item P2 description amended. Previous Pay Item P3 for prime or primer seal deleted (to be paid under the relevant prime or primer seal specs).		
	Annex B2.2.1	Table B.1 added for deductions for Characteristic Value of Relative Compaction for pavement course ≤ 250 mm thick. Table B.2 – “less than or equal to 94.9%” changed to “less than 95%”.		
	Annex B2.2.2	Equivalent IRI _s to NAASRA roughness counts added to Table B.3 on incentives and deductions for ride quality.		
	Annex E Annex L Annex M	New annexure. Characteristic tested, test method and minimum frequency of testing updated. Reference documents updated.		
Ed 2/Rev 1	Global	Clauses reworded to improve clarity.	GM, IC	04.04.12
	4	Clauses 4.3 and 4.4 moved to subclauses 4.1.1 and 4.1.2 respectively.		
Ed 2/Rev 2	2.5, 5	Content from previous clause 5 moved to new sub-clause 2.5. Clauses following previous clause 5 renumbered.	GM, IC	21.12.12
	3.1	Headings inserted to form new sub-clauses 3.1.1 and 3.1.2.		
	3.1.3, 6.5	Content from previous clause 6.5 moved to new sub-clause 3.1.3. Clauses following previous clause 6.5 renumbered.		
Ed 2/Rev 3	6.3	Reworded to improve clarity.	GM, CPS (Peter Letts)	17.01.14
Ed 3/Rev 0	Global	Minor editing and rewording to improve clarity.	GM, CPS	26.06.15
	Guide Notes	Guide Notes deleted.		
	1.1	Scope reworded.		
	2.1	Heading title changed.		

Ed/Rev Number	Clause Number	Description of Revision	Authorised By	Date
Ed 3/Rev 0 (cont'd)	2.2	Clarification added that requirements in Annex A3 take precedence over spec 3051.		
	2.4 (g)	Clause on stockpiles in context of sampling and testing reworded to clarify intent.		
	2.5	Nonconforming MTBB - changed from “may be rejected” to “must not be used in the Works”.		
	4.1 to 4.4	Clauses on mix design reorganised to align with R73 and reworded to improve clarity.		
	5	Individual sub-clauses rearranged. Previous clause 5.3 “Trial Pavement” moved to become clause 5.11.		
	5.1, 5.2	Previous clause 5.1 sub-divided into clauses 5.1 and 5.2, with clause 5.2 covering treatment of existing wearing course and patches. Subsequent clauses renumbered.		
	5.1	Requirements for PQP details for spreading of binder, mixing with insitu material, shaping, compacting and trimming added.		
	5.5.6	New sub-clause on verification of consistency of spreading added.		
	5.5.8	Clause on mixing reworded to correct requirements.		
	5.8.2	Requirements for compaction at joints clarified.		
	5.8.5	New sub-clause incorporating requirements from previous 5.7.4.		
	5.9	Headings added to form sub-clauses 5.9.1 to 5.9.3.		
	5.11	Previously clause 5.3. Headings added to form sub-clauses 5.11.1 to 5.11.3.		
	5.12	Headings added to form sub-clauses 5.12.1 to 5.12.3.		
	5.12.1	Word “scouring” added.		
	5.12.3	Temporary roadways or detours to be in accordance with spec G10.		
	6.2	Headings added to form sub-clauses 6.2.1 and 6.2.2.		
7.2	Clause on preparation and testing of samples for UCS reworded. Submission of “test results” added.			

Ed/Rev Number	Clause Number	Description of Revision	Authorised By	Date
Ed 3/Rev 0 (cont'd)	7.3 7.4.1, 7.4.3 7.8, Annex B2 7.11 Annex A Annex B2 Annex C Annex D	<p>Clause reworded to include initial assessment for consistency of spreading.</p> <p>Conformity for binder application corrected to “by dry mass of MTBB”.</p> <p>Clause on density measurement and criteria for compaction conformity rewritten to improve clarity.</p> <p>Terminology for ride quality corrected.</p> <p>Headings added to form sub-clauses 7.11.1 to 7.11.4.</p> <p>Tables reorganised and consolidated. Additional guidance notes for the Tender Documenter added.</p> <p>Heading title changed.</p> <p>Tables on applicable deductions reorganised.</p> <p>Schedules amended.</p> <p>Schedules amended.</p>		
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



INSITU PAVEMENT STABILISATION USING SLOW SETTING BINDERS

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VERSION FOR: DATE:

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FOREWORD

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REVISIONS TO PREVIOUS VERSION

This document has been revised from Specification TfNSW R75 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 are indicated in the following manner:

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

TfNSW QA SPECIFICATION R75

INSITU PAVEMENT STABILISATION USING SLOW SETTING BINDERS

1 GENERAL

1.1 SCOPE

This Specification sets out the requirements for the rehabilitation of existing granular pavements by insitu stabilisation using slow setting binders, to a maximum depth of 400 mm. It includes requirements for:

- (a) supply of imported Material To Be Bound to top up existing pavement, where specified;
- (b) supply of a slow setting binder;
- (c) spreading of the binder, mixing with the pavement material, compaction, trimming and curing to form a heavily bound pavement course;
- (d) construction of a trial section of pavement, where specified.

The areas of work and finished surface levels are either shown on the Drawings or specified in Annexure R75/A1.

This Specification is for use for major rehabilitation works. It is not intended for minor maintenance works, including patching.

1.2 STRUCTURE OF THE SPECIFICATION

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

1.2.1 Project Specific Requirements

Project specific requirements are shown in Annexure R75/A.

1.2.2 Measurement and Payment and Resolution of Nonconformities

The method of measurement and payment is detailed in Annexure R75/B.

Acceptance of materials and work must be in accordance with Annexure R75/B.

1.2.3 Schedules of HOLD POINTS, WITNESS POINTS and Identified Records

The schedules in Annexure R75/C list the **HOLD POINTS** and **WITNESS POINTS** that must be observed. Refer to Specification TfNSW Q for the definitions of **HOLD POINTS** and **WITNESS POINTS**.

The records listed in Annexure R75/C are **Identified Records** for the purposes of TfNSW Q Annexure Q/E.

1.2.4 Planning Documents

The PROJECT QUALITY PLAN must include each of the documents and requirements shown in Annexure R75/D and must be implemented.

1.2.5 Frequency of Testing

The Inspection and Test Plan must nominate the proposed testing frequency to verify conformity of the work, which must not be less than the frequency specified in Annexure R75/L. Where a minimum frequency is not specified, nominate an appropriate frequency.

1.2.6 Referenced Documents

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

Standards, specifications and test methods are referred to in abbreviated form (e.g. AS 1234). For convenience, the full titles are given in Annexure R75/M.

1.3 DEFINITIONS AND ACRONYMS

1.3.1 Definitions

The terms “you” and “your” mean “the Contractor” and “the Contractor’s” respectively.

The following definitions apply to the terms used in this Specification:

Allowable Working Time	The lesser of the Nominated Working Time and 8 hours.
Binder	For the purpose of this Specification, a hydraulic stabilising agent, such as lime, cement or ground granulated blast furnace slag used singly or in combination, to which may be added pozzolanic materials such as fly ash or other additives and which sets when mixed with pavement materials and water.
Bound material	A material with significant tensile strength produced from Material To Be Bound mixed with a binder. Bound material is also referred to as stabilised material.
Design Target Spread Rate	The design binder application rate expressed in kg/m ² , obtained by converting the binder content stated in the Nominated Mix Design, expressed as a percentage of the dry mass of the material to be stabilised.
Field Target Spread Rate	The Design Target Spread Rate to which a tolerance has been added.
Fresh joint	A joint between adjacent runs where the stabilised pavement material of each run has been placed and compacted within the Nominated Working Time of the first placed run.

Joint	A plane formed in the bound pavement course between different materials, or materials constructed by different construction methods, or materials with different batching times, or materials with different placement times.
Material To Be Bound (MTBB)	The unbound material prior to stabilisation with a binder.
Nominated Working Time	The lesser of the Working Times determined with respect to maximum dry density and with respect to unconfined compressive strength, in accordance with Test Method TfNSW T147.
Pavement course	A pavement course consists of uniform material with uniform structural properties. May be applied to subbase, base and wearing courses.
Run	An area of pavement within a Lot that is placed continuously (without stopping the plant). The dimensions of a run are: <ul style="list-style-type: none">• continuous longitudinal length, and• output width from the equipment.
Slow setting binder	A binder which, when mixed with the MTBB, creates a mix with a Nominated Working Time of at least 6 hours.
Target moisture content envelope	The range of moisture content (on the dry side of the optimum moisture content) determined for compaction.

1.3.2 Acronyms

IRI_s	International roughness index of a section as defined in Test Method TfNSW T188.
NATA	National Association of Testing Authorities, Australia.
UCS	Unconfined compressive strength.

2 MATERIAL TO BE BOUND

2.1 TYPES

Material To Be Bound (MTBB) in accordance with this Specification includes:

- imported Material To Be Bound;
- existing base and/or subbase material, which may already have been bound; and
- any combination of these materials together with the existing bituminous seal, or thin asphalt wearing surface where the thickness does not exceed 80 mm, and/or patching materials where specified to be incorporated into the pavement course in Annexure R75/A2.

2.2 IMPORTED MATERIAL TO BE BOUND

Imported MTBB must comply with the requirements of Specification TfNSW 3051, and any additional requirements stated in Annexure R75/A3. Where there is a conflict between these two sets

of requirements, the additional requirements in Annexure R75/A3 take precedence over those in TfNSW 3051.

Frequency of sampling and testing of imported MTBB must comply with TfNSW 3051.

2.3 CERTIFIED STOCKPILES

Stockpiles of MTBB that have been tested and shown to conform to the requirements of TfNSW 3051 are designated as Certified Stockpiles.

Prior to the release of MTBB from a Certified Stockpile, provide the Principal with a signed statement certifying that the material from the Certified Stockpile meets the requirements of this Specification and the relevant properties stated in TfNSW 3051. Include NATA endorsed test results with the statement. Indicate clearly in the statement the quantity of material represented by the test results.

HOLD POINT

Process Held:	Deliveries of MTBB from a Certified Stockpile.
Submission Details:	Details of the stockpile, statement of conformity and documentation specified in TfNSW 3051 regarding conformity.
Release of Hold Point:	The Principal will consider the submitted documents prior to authorising the release of the Hold Point.

Once a stockpile has been certified, do not add any further material to the stockpile until the additional material has been tested and shown to conform to this Specification. Provide the Principal with test certificates verifying the conformity of all such additional material.

MTBB supplied from Certified Stockpiles will generally not require any further testing.

If subsequent inspection and/or testing of the material at the stockpile or at the point of delivery indicate that the properties of the material have changed since certification, for example, due to segregation, contamination or weathering, the Principal will stop further deliveries of the material, and require further sampling and testing of the stockpile. The conformity or otherwise of the material will be reassessed, on the basis of these test results.

Each delivery docket must identify the Certified Stockpile from which the material is supplied.

2.4 SITE STOCKPILES

Delivery of MTBB to site stockpiles must comply with the requirements of Clause 2.5. If the material has not been sourced from a Certified Stockpile, the site stockpile must be certified in accordance with Clause 2.3 prior to using the material.

Place the site stockpiles of MTBB only at the locations shown on the Drawings or approved by the Principal.

You are responsible for preparation of the stockpile sites, unless specified otherwise in Annexure R75/A2.

When stockpiling MTBB on site, comply with the following:

- (a) Place stockpiles on firm, even, well-drained ground or over a constructed floor.
- (b) Install and maintain around the stockpiles appropriate erosion and sedimentation controls in accordance with Specification TfNSW G38 for the duration of the Contract.
- (c) Construct stockpiles in a manner which does not result in segregation. Place the material in horizontal layers, with each new additional layer fully within the boundary of the underlying layer. Do not push the stockpile into a cone shape. Stockpiles must be of uniform shape with side slopes neither steeper than 1.5 horizontal to 1 vertical, nor flatter than 3 horizontal to 1 vertical.

The total height of any stockpile must not exceed 4 m, unless approved otherwise by the Principal.

- (d) The worked face of any stockpile must be the full face of the stockpile.
- (e) Keep the stockpile material sufficiently damp to avoid loss of fines and to keep dust levels down.
- (f) Keep the stockpiles separated from each other and maintain them to prevent the stockpiled materials from becoming intermixed, or contaminated with foreign material.
- (g) In the context of sampling and testing, the stockpile may be constructed in either one of the following two ways:
 - (i) the stockpile is built up continuously until it is complete, and once complete, no further material is added to the stockpile, with each stockpile constituting a separate Lot;
 - or
 - (ii) the stockpile is built up incrementally, and any further material added to the stockpile previously verified as conforming is considered to be a new Lot, with the new material first tested and verified as conforming before it is added to the stockpile.
- (h) Clearly and uniquely identify each stockpile by signposting, stating the type and quantity of material present in the stockpile. For the purposes of this Specification, the maximum Lot size for Certified Stockpiles is 4,000 tonnes.
- (i) On completion of Works, clear the stockpile locations of all surplus material and re-vegetate the area in accordance with Specification TfNSW R178.

Include in the PROJECT QUALITY PLAN details of procedures for the construction, operation and restoration of stockpile sites, and measures to be taken to meet the requirements of this Clause.

2.5 DELIVERY OF IMPORTED MATERIAL TO BE BOUND

Transport MTBB in vehicles which are so constructed that loss of material does not occur. The delivery vehicles used must be suitable for the ground conditions at the Site.

The material must be kept suitably damp to prevent segregation or loss of fines during transit and must, at the time of delivery, have a moisture content (uniformly distributed) not greater than the optimum moisture content as determined by either Test Method TfNSW T111 or T162.

MTBB delivered to the Site which is unsuitable for reasons such as segregation or contamination is considered to be nonconforming and must not be used in the Works.

Include in the PROJECT QUALITY PLAN the methods for preventing segregation and/or loss of fines during transport.

3 OTHER MATERIALS

3.1 BINDERS

3.1.1 General

Use only binder(s) stated in the approved nominated mix design for the Works.

Binders, including blended binders, must comply with the requirements of Specification TfNSW 3211.

Include in the PROJECT QUALITY PLAN details of all cementitious and pozzolanic materials, and the blend proportions of blended binders if applicable, proposed for use in the Works, together with supporting test results traceable to the materials supplied.

3.1.2 Blended Binders

The actual proportions of the components of a blended binder must not vary by more than $\pm 3\%$ from the blend percentages nominated. Test each component at the respective minimum frequencies stated in Annexure R75/L. A reduced testing frequency may be permitted in accordance with TfNSW Q.

Blended binders must be uniformly blended prior to delivery to Site.

3.1.3 Delivery of Binder

Transport binders in watertight containers and protect the binder from moisture until use. Do not use binder that has become caked or lumpy in the Works.

With each delivery of blended binders to Site, provide certification that the actual blend proportions are within $\pm 3\%$ of the blend percentages nominated.

Sample and test the binder in accordance with TfNSW 3211. Detail in the PROJECT QUALITY PLAN the method of sampling the binder.

3.2 WATER

Water for use in the Works must be free from deleterious amounts of materials such as oils, acids, alkalis and vegetable substances.

Water taken from other than a town water supply system must not contain more than:

- (a) 600 mg/L of chloride ion, when measured using Test Method TfNSW T1004;
- (b) 400 mg/L of sulfate ion, when measured using Test Method TfNSW T1014;
- (c) 1% by mass of undissolved solids, when measured in accordance with AS 3550.4.

Where recycled water is proposed for use, the water must meet the above requirements and those in Specification TfNSW G36 with the maximum concentration of 1,000 thermo-tolerant coliforms per 100 ml when tested in accordance with Test Method TfNSW T1015.

Include in the PROJECT QUALITY PLAN details of the water proposed for use in the Works, including the water source.

3.3 RETARDERS

Where you propose to use retarders to retard the setting time of the bound material, provide details of the retarders with the nominated mix design, together with a Certificate of Compliance, supported by NATA endorsed test certificates confirming compliance with AS 1478, or with another recognised national or international standard.

The retarder must be a liquid.

Include in the PROJECT QUALITY PLAN details of your procedures for incorporating the retarder uniformly within the pavement course.

3.4 SAFETY DATA SHEETS

Include in the PROJECT QUALITY PLAN the Safety Data Sheets (SDS) for the binders and retarders proposed for use in the nominated mix design and procedures for their safe handling.

4 MIX DESIGN

4.1 MIX DESIGN REQUIREMENTS

Nominated mix designs must comply with the following:

- (a) Have a Nominated Working Time (determined in accordance with Test Method TfNSW T147) in excess of 6 hours or as stated in Annexure R75/A2, using a slow setting binder.
- (b) The insitu material (without inclusion of imported MTBB) after stabilisation must have:
 - (i) an unconfined compressive strength (UCS) at 28 days normal curing or 7 days accelerated curing, of at least 3 MPa.
 - (ii) a UCS strength gain of at least 1 MPa. The UCS strength gain is the difference between the UCS values measured at 7 days normal curing, and that at 28 days normal curing (or 7 days accelerated curing), when tested in accordance with Test Method TfNSW T131.

Where imported MTBB to top up the existing pavement is required, the imported MTBB after stabilisation must also have a UCS of at least 3 MPa and have UCS strength gain of at least 1 MPa.

- (c) Have a binder application rate of at least 4% by dry mass of the insitu and any imported pavement material to be stabilised, unless approved otherwise by the Principal.

4.2 NOMINATED MIX DESIGN

4.2.1 General

Mix designs may be nominated either by the Principal or by the Contractor. The party responsible for nominating the mix design is stated in Annexure R75/A2.

4.2.2 Mix Design Nominated by the Principal

Where the mix design is nominated by the Principal, details of the mix design are given in Annexure R75/A4.

Where the mix design is nominated by the Principal, the Contractor may propose an alternative mix design for approval.

4.2.3 Mix Design Nominated by the Contractor

Where the Contractor is required to nominate a mix design, as specified in Annexure R75/A2, or where the Contractor proposes an alternative mix design, submit to the Principal, at least 10 working days before the commencement of Works, your nominated mix design for approval, including the completed Table R75/E.1. The mix design must comply with the requirements of Clause 4.1.

HOLD POINT

Process Held:	Use of each Contractor nominated mix design.
Submission Details:	At least 10 working days prior to commencement of the trial section of pavement construction (if specified in Annexure R75/A2), or commencement of the pavement works, submit to the Principal details of your nominated mix design(s) and test results verifying conformity of the nominated mix design(s).
Release of Hold Point:	The Principal will consider the submitted documents prior to accepting the Contractor nominated mix design and authorising the release of the Hold Point.

4.3 SUPPLEMENTARY INFORMATION

For each mix design (whether nominated by the Principal or by you), submit to the Principal at least 10 working days before the commencement of work, the following supplementary information:

(a) Imported Material To Be Bound

Details and test results of the imported MTBB in accordance with TfNSW 3051.

(b) Insitu Material To Be Bound

- (i) Optimum moisture content and maximum dry density, including associated test results.
- (ii) Target moisture content envelope.

(c) Binders (Cementitious and Pozzolanic Materials)

- (i) Type and source of each component.
- (ii) Proportion of each component in a blended binder.
- (iii) Proportion of binder (by dry mass of MTBB) to be added.
- (iv) Test results for binder, or for each component in a blended binder complying with TfNSW 3211.

(d) Water

- (i) Source.
- (ii) Test results verifying compliance with Clause 3.2.

(e) Bound Material (required only when mix design is nominated by the Contractor):

- (i) Data including test results verifying that the bound material complies with the mix design requirements.
- (ii) Data including test results establishing the Nominated Working Time for each nominated mix design.

Any required testing must be carried out in the 12 months immediately preceding the date of submission of the test results to the Principal. All phases of any particular test must be carried out in the same laboratory.

4.4 VARIATION TO NOMINATED MIX DESIGN

If you vary the source, nature or type of any constituent material, or the proportion of any of the constituent materials, by more than 10% from the nominated quantity in either the Principal nominated mix design or the approved Contractor nominated mix design, submit a new nominated mix design for approval in accordance with Clause 4.2.3.

The Hold Point in Clause 4.2.3 will again apply.

5 CONSTRUCTION

5.1 GENERAL

Carry out insitu pavement stabilisation in a manner which will:

- (a) prevent segregation or loss of material;
- (b) produce a product which is homogeneous between joints and edges;
- (c) prevent the development of laminations, lenses, pockets, lumps or granules of incompletely mixed pavement material in the pavement.

The entire process from spreading of binder, mixing with the insitu material, shaping, compacting and trimming must proceed continuously until completion, within the Allowable Working Time of the mix.

Include in the PROJECT QUALITY PLAN:

- (i) details of your equipment and methods of spreading of binder, mixing with the insitu material, shaping and compacting and trimming;
- (ii) details of your method for working adjacent to concrete structures such as bridges, pits, manholes or concrete medians.

5.2 EXISTING WEARING COURSE AND PATCHES

Remove and dispose of existing wearing courses in excess of 80 mm thick in accordance with Specification TfNSW R101.

Where asphalt and cementitious stabilised patches are specified in Annexure R75/A2 to be incorporated into the stabilised pavement course, include in the PROJECT QUALITY PLAN the procedures for their pulverisation and their uniform mixing with adjacent pavement material.

Otherwise, remove and replace the patches with granular material meeting the requirements of TfNSW 3051. Include in the PROJECT QUALITY PLAN the method of removal of patches and their replacement with imported pavement material(s).

5.3 WEATHER CONDITIONS

Do not carry out pavement stabilisation when any of the following apply:

- (a) during rain or when rain appears imminent;
- (b) when the pavement temperature measured at a depth of 50 mm below the surface of the road is below 10°C, or the air temperature measured in the shade is above 40°C;
- (c) when the wind is sufficiently strong to cause particles of binder to become air-borne;
- (d) during conditions that, in the opinion of the Principal, may cause nuisance to people, property or the environment.

Include in the PROJECT QUALITY PLAN details of procedures for cessation of operations in the event of adverse weather conditions.

5.4 PLACING OF IMPORTED MATERIAL TO BE BOUND

The finished surface levels are either shown on the Drawings or specified in Annexure R75/A1.

Where an increase in surface level over that of the existing pavement is specified, place a layer of imported MTBB over the existing pavement in order to achieve the required finished surface levels.

Spread and partially compact the imported MTBB prior to carrying out stabilisation.

Describe in the PROJECT QUALITY PLAN the procedure to determine the quantity of imported MTBB required, taking into account any bulking following incorporation of binder, and minimising the amount of bound material that needs to be trimmed after compaction.

5.5 SPREADING AND MIXING OF BINDER

5.5.1 General

Include in the PROJECT QUALITY PLAN the procedures, and inspection and test plan, for spreading and mixing of binder.

5.5.2 Alternative Construction Method

Any proposed procedure for incorporation of binder by methods other than spreading the binder on the pavement in advance of mixing is termed an Alternative Construction Method.

HOLD POINT

Process Held:	Use of an Alternative Construction Method.
Submission Details:	Details of procedures, and inspection and test plan, for spreading and mixing of binder, and documents verifying calibration of the spread rate at a demonstration or during construction of the trial section of pavement.
Release of Hold Point:	The Principal will consider the submitted documents prior to authorising the release of the Hold Point.

5.5.3 Design and Field Target Spread Rates

Determine the Design Target Spread Rate of binder in kg/m^2 from the nominated mix design and the specified compacted course thickness.

Add a minimum tolerance of 2 kg/m^2 to the Design Target Spread Rate to obtain the Field Target Spread Rate.

At least 14 days prior to the commencement of spreading of binder, submit to the Principal the completed Table R75/E.2 and supporting calculations.

5.5.4 Spillage of Binders and Retarders

Remove, as soon as possible and not later than 12 hours, any spillage of binder or retarder on the Site or at any loading locations. Do not incorporate spilled binder or retarder into the pavement material.

Include in the PROJECT QUALITY PLAN your procedures for dealing with spillage of binder and retarder in accordance with TfNSW G36 and the relevant SDS.

5.5.5 Spreading of Binder

Spread the binder using vehicles fitted with load cells or other forms of weighing systems capable of providing a recordable output of the rate at which the binder is applied.

Spreading must be visually uniform throughout each spreader run.

Include in the PROJECT QUALITY PLAN the method of continuous monitoring of spread rate and the calibration method.

When the Field Target Spread Rate exceeds 20 kg/m^2 , spread the binder using a minimum of two passes. Where the binder is spread in two or more passes, the spread rate for each pass must be approximately equal to each other, but not exceeding 20 kg/m^2 , unless approved otherwise by the Principal.

Prior to mixing, calculate the actual spread rate. Where the spread rate (kg/m^2) achieved for each run is less than 95% of the Field Target Spread Rate, spread extra binder to achieve the Field Target Spread Rate.

5.5.6 Consistency of Spreading

Initially, verify the consistency of spreading by conducting tray tests in accordance with Test Method TfNSW T136 during construction of the trial section of pavement (refer Clause 5.11), or the first Lot of pavement construction if a trial pavement is not required.

Perform one tray test in accordance with TfNSW T136 for every 100 m run of the initial pavement construction, with at least two tests per run, and compare the spread rate determined by TfNSW T136 with that determined using load cells.

If the spread rate as determined using load cells is not within $\pm 10\%$ of that determined by TfNSW T136, continue with the tray tests for all subsequent Lots until there is consistency to within $\pm 10\%$ between the spread rate determined using load cells and that determined by TfNSW T136.

5.5.7 Mixing Equipment

Use mixing equipment purpose built for insitu mixing of pavement materials, capable of mixing to the depth specified, pulverising and mixing all bituminous surfacing and/or patches and of distributing both the binder and moisture uniformly for the full depth and over the total area.

The equipment must be capable of applying moisture uniformly during mixing through a series of nozzles on a spray bar located in the mixing hood. Each nozzle on the spray bar must be independently controlled to ensure a uniform transverse moisture distribution in overlapping runs.

Include in the PROJECT QUALITY PLAN details of the mixing equipment proposed for use and its suitability for the materials to be processed.

Replace any mixing tools, blades or tynes which are worn out or damaged so as to maintain mixing efficiency as demonstrated in the trial section of pavement.

5.5.8 Mixing Operation

Mix and compact the stabilised pavement course as a single layer which, after trimming, conforms to the stabilised pavement thickness specified in Annexure R75/A1.

A minimum of two passes of the mixing equipment is required.

Where the total amount of binder is spread in a single pass, the spread binder must be mixed into the pavement material to the full pavement depth specified in Annexure R75/A1.

Where the binder is spread in two or more passes, the binder spread in the first pass must be mixed into the pavement material to about 90% of the pavement depth. The remaining binder must be spread and mixed to the full depth in the second and any successive mixing pass(es).

The resultant mix must be uniform over the full depth and total area, with no lenses, pockets, lumps or granules of either incompletely mixed pavement material or incompletely mixed binder present.

Include in the PROJECT QUALITY PLAN details of the mixing operation, proposed width of passes and nominated depth of mixing to ensure that the specified stabilised pavement thickness is achieved.

Where the binder is spread in advance of the mixing operation, minimise disturbance to the unmixed binder.

Where visual inspection indicates that the binder is not uniformly mixed with the existing pavement material and/or the moisture distribution throughout the pavement course is variable, carry out additional passes with the mixing equipment to improve the uniformity of:

- (a) material being stabilised; and/or
- (b) distribution of the binder; and/or
- (c) distribution of moisture.

5.6 MOISTURE CONTENT

Develop a work method and target moisture content envelope that will ensure that:

- (a) there is adequate moisture in the pavement material to achieve binder hydration and the specified compaction;
- (b) the pavement is capable of taking traffic load without shoving or ravelling on completion of compaction.

Moisture must be uniformly distributed throughout the depth immediately prior to compaction. Adjust the moisture content of the material until it is within the target moisture content envelope for compaction.

Include in the PROJECT QUALITY PLAN the procedure to incorporate water in the Material To Be Bound and to achieve a uniform distribution of water and within the target moisture content envelope.

5.7 COMPACTION

Commence compaction immediately after the mixing of binder into the pavement material. Compaction must be a continuous operation. Complete compaction on the same day as mixing and within the Allowable Working Time of the mix.

Compact the stabilised pavement to its full depth over the entire area, except for the areas adjacent to fresh joints, as described in Clause 5.8.2.

Include in the PROJECT QUALITY PLAN details of the procedure to be followed to ensure that the specified compaction is achieved.

5.8 JOINTS

5.8.1 General

Include in the PROJECT QUALITY PLAN details of the locations and types of construction joints, treatment of overlaps and irregular shaped Lots, locations of unsupported edges, and compaction rolling pattern.

HOLD POINT

Process Held:	Stabilisation of pavement material.
Submission Details:	Locations and types of construction joints, treatment of overlaps and irregular shaped Lots, locations of unsupported edges and details of compaction rolling pattern.
Release of Hold Point:	The Principal will consider the submitted documents prior to authorising the release of the Hold Point.

5.8.2 Fresh Joints

A joint is deemed to be fresh when the pavement material adjacent to both sides of the joint has been stabilised within the Nominated Working Time of the material mixed in the first spreader run. Keep the edge of the first spreader run moist until the start of the second spreader run.

A fresh joint does not constitute a Lot boundary.

Where a fresh longitudinal joint between adjacent runs is to be compacted, do not compact material mixed in the first run that is within 300 mm of the joint until the adjacent material in the second run is ready for compaction. Keep the joint moist until the start of the second run.

The moisture content in the vicinity of the joint must be within the target moisture content specified by you.

5.8.3 Transverse and Longitudinal Construction Joints

Spread the pavement material in a manner which minimises the number of joints.

The layout of joints must conform to the following requirements:

- (a) Transverse joints must be formed at right angles to the road centreline.
- (b) Longitudinal joints must:
 - (i) not be located at wheel paths;
 - (ii) be formed within ± 100 mm of separation lines of travel lanes;
 - (iii) be located at a minimum distance of 300 mm away from the edge lines and located within the shoulder area.
- (c) The distance between non-fresh longitudinal joints, or between a non-fresh longitudinal joint and the edge of bound pavement course, must not exceed 5 m.

5.8.4 Stabilisation Adjacent to Joints

Carry out stabilisation in a manner which ensures that there is no unbound material between joints.

Ensure consistent distribution of binder and mixing and compaction at the joint.

Include in the PROJECT QUALITY PLAN details of overlap and/or cutting back of previously stabilised material to ensure a consistent distribution of binder, mixing and compaction at the joint.

5.8.5 Disposal of Cutback Material

Dispose of all cutback material. Do not incorporate cutback material into subsequent pavement courses.

Include in the PROJECT QUALITY PLAN the method of disposal of waste material.

5.9 TRIMMING

5.9.1 General

On completion of compaction, carry out trimming to produce a surface which is parallel to the finished wearing surface.

Include in your PROJECT QUALITY PLAN details of your method of trimming and survey control which ensure that the pavement course thickness is not reduced during trimming to the extent that it fails to comply with the requirements of Clause 7.5.

Trimming should be carried out within the Allowable Working Time but must be completed within the Nominated Working Time for the run being trimmed and in a manner which provides an acceptable surface for the application of the overlying pavement course or bituminous surfacing.

Carry out trimming in preparation for a prime, primerseal or seal only when the surface can be cut without causing damage to the pavement surface.

5.9.2 Pavement Surface After Trimming

Include in the PROJECT QUALITY PLAN a procedure which ensures that, after trimming, the finished surface of the pavement is a tightly bound matrix of coarse and fine material without a slurry of fines.

No roller marks must remain on the pavement surface after trimming.

5.9.3 Disposal of Trimmed Material

Dispose of all trimmed material. Do not incorporate trimmed material into subsequent pavement courses.

Include in the PROJECT QUALITY PLAN the method of disposal of the trimmed material to waste.

5.10 CURING

Curing of a Lot, to prevent the bound material from rapid drying out, must commence immediately after completion of compaction and must continue until a bituminous seal or the subsequent pavement course is placed over the bound material.

During curing, apply water to the surface uniformly and in a manner which will keep the surface continuously damp but without causing ponding, significant runoff, slurring of the surface, pavement instability and erosion or leaching of the binder.

Include in the PROJECT QUALITY PLAN details of your procedures for curing.

5.11 TRIAL PAVEMENT

5.11.1 General

When specified in Annexure R75/A2, construct a trial section of pavement at a location agreed with the Principal, using the same materials, equipment and methods described in the PROJECT QUALITY PLAN. When an Alternative Construction Method as stated in Clause 5.5.2 is proposed, demonstrate compliance with the requirements of Clause 5.5.2 during the trial.

The trial section of pavement must be between 100 m and 200 m long for the proposed Lot width.

Demonstrate that, for the work at the trial section of pavement, the specified compaction, course thickness and levels as well as the specified pavement properties can be achieved.

WITNESS POINT

Process Witnessed: Construction of trial section of bound pavement.

Submission Details: Notification of the construction of the trial section of pavement at least 3 working days prior to commencement.

HOLD POINT

Process Held: Construction of bound pavement.

Submission Details: Documentation, including test results, verifying that the trial section of pavement conforms to the specified requirements.

Release of Hold Point: The Principal will consider the submitted documents prior to authorising the release of the Hold Point.

5.11.2 Nonconformities

If there are nonconformities in the trial section of pavement, the Principal may require the construction of a further trial section of pavement before releasing the Hold Point. The Principal may also require your proposed disposition to include modifications to the equipment and/or methods of construction. Treat the nonconforming trial section of pavement in accordance with Clause 7.11.

5.11.3 New Trial Section

The Principal can require a new trial section of pavement to be carried out when you make changes to plant, equipment, method of construction, materials, mix, rate of work or when any material or work does not comply with this Specification.

5.12 PROTECTION OF WORK

5.12.1 Adequate Drainage

Provide adequate drainage of all working areas throughout the period of construction to avoid ponding or scouring.

5.12.2 Trafficking of Newly Placed Pavement

Except for construction plant and vehicles carrying out the construction or testing of a particular section of pavement, do not allow traffic to travel over the spread material prior to completion of mixing.

5.12.3 Temporary Roadways and Detours

Provide temporary roadways or detours in accordance with Specification TfNSW G10 during construction of the pavement.

Where it is not practicable to provide temporary roadways or detours, the pavement may be constructed in stages; with only part of the width of the pavement being constructed at each stage so that traffic may use the remaining width not under construction.

Include in the PROJECT QUALITY PLAN details of the procedures to comply with this Clause.

5.13 BITUMINOUS SEAL

Spraying of bituminous seal can only commence when the bound pavement surface is sufficiently firm, neatly and tightly bound without a slurry of fines, and ready to receive the sprayed bituminous seal without punching of the sealing aggregates into the bound pavement layer.

Where specified in Annexure R75/A2, apply either a prime, primerseal or seal within 6 days of incorporation of binder in the MTBB. Application of prime, primerseal or seal must be in accordance with either Specification TfNSW R106 or R107, as specified in Annexure R75/A2.

HOLD POINT

Process Held: Priming, primersealing or sealing of surface of bound pavement course.

Submission Details: Conformity reports verifying that each Lot conforms with respect to specified level, thickness, surface deviation and compaction, and notification that the bound pavement course is ready for sprayed sealing.

Release of Hold Point: The Principal will consider the submitted documents prior to authorising the release of the Hold Point.

6 SURVEY

6.1 GENERAL

Carry out survey in accordance with Specification TfNSW G71.

During the progress of the Work, carry out surveys to determine the levels at:

- (i) bottom of the bound pavement course; and
- (ii) top of the bound pavement course.

Determine the levels using a survey staff (or reflector) with a flat base of area between 300 mm² and 4,000 mm². Allow for seal thickness in determining the levels. Where the survey is undertaken for a

sealed surface, remove any loose foreign matter, including loose aggregates, before the survey and determine the levels by deducting the Average Least Dimension of the cover aggregate of the seal.

6.2 SURVEY OF FINISHED SURFACE LEVELS

6.2.1 Finished Surface Levels Not Shown On Drawings

Where the bound pavement course finished surface levels must be compared with existing surface levels to assess conformity, survey the existing surface levels before the spreading and mixing of binder.

Where an increase in surface level over that of the existing pavement is specified in Annexure R75/A1, either:

- (a) obtain by survey the existing surface levels before spreading and mixing of binder and again, after trimming, obtain by survey the bound pavement surface level, to assess conformity; or
- (b) obtain by survey the levels at recoverable points on the existing pavement surface before and after stabilisation.

Survey locations must be along a 100 m line, at a constant offset which is not greater than 4.5 m from the road centreline, and can be on either side of the road centreline. Select and survey the end points of each line so as to be recoverable to an accuracy of ± 100 mm.

Describe the method of selection of the 100 m line in the PROJECT QUALITY PLAN.

Record the levels at 10 equidistant points along the line, both before placing imported MTBB and after trimming of the stabilised material. The average of the increase in levels at these 10 points is the increase in surface level at that sampling location.

Obtain the average increase in level at 2 sampling locations per Lot to assess whether the increase in level conforms to the nominated increase in level specified in Annexure R75/A1. A Lot must not exceed one day's stabilisation work or a surface area of 5,000 m² and must be surveyed at two sampling locations (100 m lines).

6.2.2 Finished Surface Levels Shown On Drawings

Where finished surface levels are shown on the Drawings, survey the bound pavement course finished surface level to assess conformity.

6.3 SURVEY FOR THICKNESS

On completion of mixing but prior to compaction, measure the levels at the bottom of the bound pavement course at the locations where samples will be taken for compaction assessment (refer Clause 7.4).

Following compaction and trimming to final levels, measure the levels at the top of the bound pavement course at the same corresponding locations (within ± 50 mm in the horizontal plane).

7 CONFORMITY

7.1 GENERAL

Each Lot must comply with the following requirements. Nonconforming Lots must be dealt with in accordance with Clause 7.11.

7.2 UNCONFINED COMPRESSIVE STRENGTH

For each Lot and at the same location as that for insitu density testing (refer Clause 7.4.1), prior to compaction, take samples at the minimum frequency specified in Annexure R75/L. Do not take samples from areas of overlap between runs.

Prepare and test the samples as follows:

- (a) store the samples in a loose state inside airtight sealed containers prior to moulding;
- (b) mould the samples within the Allowable Working Time for the mix, and at the moisture content corresponding to that for maximum standard compaction;
- (c) test the samples in accordance with Test Method TfNSW T116, at either 28 days normal curing or 7 days accelerated curing.

Record and report the following in addition to the reporting requirements of TfNSW T116:

- (i) chainage and offset of each sampling location;
- (ii) time of commencement and completion of mixing at the sampling location;
- (iii) time of taking each sample;
- (iv) time of commencement of compaction of each UCS sample.

Submit the tested samples and test results to the Principal within 5 days of testing.

7.3 BINDER APPLICATION RATE

Submit the following information to the Principal on completion of each spreader run:

- (a) Chainages and offsets of start and finish locations.
- (b) Width of spread and depth of incorporation of binder.
- (c) Type and quantity of binder spread. If monitored by both tray tests and load cells concurrently, provide information for both.
- (d) Calculated binder spread rate, expressed as a percentage of the Field Target Spread Rate (which is measured in kg/m²), initially for each 100 m length (refer Clause 5.5.6) and subsequently for each 200 m length once consistency of spreading has been established.

When measuring at 200 m lengths, combine any length less than 200 m with the length preceding it, and determine the spread rate as an average over the combined length.

- (e) Calculated binder spread rate by dry mass of MTBB, in kg/tonne based on actual measured field thickness of pavement course.

For each 100 m or 200 m length, as required:

- (i) the calculated binder spread rate, expressed as a percentage of the Field Target Spread Rate, must not be less than 95%;
- (ii) the calculated binder spread rate, by dry mass of MTBB, must not be less than the design application rate by mass.

7.4 COMPACTION AND MOISTURE CONTENT

Determine the sampling locations for each Lot in accordance with TfNSW Q. Each Lot must be visually homogeneous.

For each sampling location, obtain the insitu density and take samples for determining the field moisture content and the maximum wet density in the laboratory.

7.4.1 Insitu Density

Carry out insitu density tests in accordance with Test Method TfNSW T173 on the stabilised material within the Allowable Working Time of the mix after completion of compaction.

The depth of testing is as follows:

(a) Pavement course \leq 250 mm thick:

as close to the bottom of the stabilised pavement course as the probe will allow.

(b) Pavement course $>$ 250 mm:

(i) at depth “Y”, equal to 150 mm;

(ii) at depth “X”, which is as close to the bottom of the stabilised pavement course as the probe will allow, or at the maximum extension of the probe (300 mm) where the course thickness exceeds 300 mm

(Refer to TfNSW T173 showing which part of the layer the dimensions “X” and “Y” refer to.)

Determine the wet density D_z for the lower part of the stabilised pavement course in accordance with TfNSW T173.

Repair nuclear density test holes with freshly mixed material identical to that of the surrounding pavement. Compact the repair material within the Nominated Working Time to the same extent as that of the surrounding pavement. Detail in the PROJECT QUALITY PLAN the method of repairing test holes.

7.4.2 Maximum Wet Density

The location of the sample for the determination of maximum wet density must be the same as that for the determination of insitu density.

Determine the maximum wet density in accordance with TfNSW T162 on a sample taken prior to compaction. Compact the sample within 3 hours of sampling and within the mix’s Allowable Working Time.

Record and report the time of commencement of mixing of the material at the sampling location and the time of sampling.

7.4.3 Relative Compaction

Calculate the relative compaction in accordance with Test Method TfNSW T166.

Determine the characteristic value of relative compaction in accordance with TfNSW Q and report to one decimal place.

For pavement course \leq 250 mm thick, the characteristic value of relative compaction, based on the wet density measured as close to the bottom of the course as the probe will allow, must be \geq 102%.

For pavement course $>$ 250 mm thick:

- (a) the characteristic value of relative compaction, based on the wet density measured as close to the bottom of the stabilised course as the probe will allow, or at the maximum extension of the probe (300 mm) where the course thickness exceeds 300 mm, must be \geq 100%; and
- (b) the individual value of relative compaction, based on the calculated wet density D_z for the lower part of the stabilised pavement course, must be \geq 95%.

Record and report the following:

- (i) test locations;
- (ii) relative compaction result(s) for the pavement depth at each location; and
- (iii) characteristic value of relative compaction of each Lot.

7.4.4 Field Moisture Content

At each test location where an insitu density test was performed, take a sample for the determination of field moisture content. Take samples immediately prior to compaction.

Determine the moisture content in accordance with Test Method TfNSW T120, T121 or T180.

The field moisture content must be within the target moisture content envelope as specified in Clause 5.6.

7.5 THICKNESS

After final trimming, the bound pavement course thickness at any point as determined in accordance with Clause 6.3 must be 10 mm to 30 mm above the thickness shown on the Drawings or specified in Annexure R75/A1.

7.6 SURFACE LEVELS

After final trimming, the pavement surface must be parallel to the design finished surface.

The surface levels after final trimming must be between 0 and 10 mm above the finished surface levels shown on the Drawings or specified in Annexure R75/A1.

7.7 SURFACE DEVIATION

After final trimming, test the surface with a 3 m straight edge laid in any direction.

Include in the PROJECT QUALITY PLAN details of the planned locations for taking straight edge measurements.

The surface of the bound pavement course must not deviate from a 3 m straight edge laid in any direction by more than 5 mm. Additionally, there must be no abrupt change of levels in the transition from the pavement to fixed structures such as a bridge deck, or adverse changes that will affect surface pavement drainage.

7.8 RIDE QUALITY

Where specified in Annexure R75/A2, measure the ride quality of the finished pavement surface within 2 weeks after the prime, primerseal or seal has been applied and swept, with either:

- (a) a calibrated NAASRA Roughness Meter in accordance with Test Method TfNSW T182; or
- (b) a laser profilometer in accordance with Test Method TfNSW T188.

Include in the PROJECT QUALITY PLAN details of the equipment to be used for measuring the ride quality of the finished pavement surface, and associated calibration data.

Where the NAASRA Roughness value over a 100 m survey interval is less than 65 counts/km (equivalent to IRI_s value of 2.5 m/km), incentives or deductions in accordance with Annexure R75/B2 will apply.

Where the NAASRA Roughness value over a 100 m survey interval is equal to or exceeds 65 counts/km (equivalent to IRI_s value of 2.5 m/km), the pavement course constructed for that length must be either reworked, or removed and replaced.

7.9 WIDTH

Measure the width of bound pavement between the outside edges of the bound pavement course.

The width of bound pavement must not be less than the width shown on the Drawings or specified in Annexure R75/A1.

7.10 CERTIFICATE OF CONFORMITY

Unless approved otherwise by the Principal, submit weekly to the Principal a signed certificate verifying conformity with the requirements of Clause 7.

Where appropriate, submit with the certificate a summary of test results from a laboratory accredited by NATA. Additionally, submit daily to the Principal the moisture content and relative density test results.

Highlight any nonconforming Lots.

7.11 TREATMENT OF NONCONFORMING LOTS

7.11.1 General

Where a Lot is nonconforming, submit to the Principal a Nonconformity Report and your proposed disposition for the Lot.

Lots that are nonconforming with respect to compaction or ride quality may be accepted with a deduction in accordance with Annexure R75/B2. Nonconforming Lots not accepted with a deduction must be either rectified or replaced.

HOLD POINT

Process Held:	Rectification or replacement of a nonconforming Lot.
Submission Details:	Nonconformity Report and details of your proposal to rectify or replace the Lot.
Release of Hold Point:	The Principal will consider the submitted documents prior to authorising the release of the Hold Point.

7.11.2 Rectification

Where rectification by re-stabilisation is proposed, in conjunction with an appropriate NATA registered laboratory, prepare and submit to the Principal a re-stabilisation proposal which takes into account the effects of the binder already incorporated in the rejected Lot.

Where rectification by an alternative to re-stabilisation is proposed, submit to the Principal:

- (a) your proposed alternative, supported by pavement design calculations;
- (b) NATA endorsed test certificates and a report of the investigations carried out; and
- (c) proposed method of carrying out the work.

7.11.3 Removal and Replacement

Removal and replacement of pavement course must comply with the requirements of this Specification.

7.11.4 Cost of Rectification

The costs of rectifying, or removal and replacement, of nonconforming Lots, including any restoration work to any underlying or adjacent surface or structure which becomes necessary as a result of such rectification or replacement, will be borne by you.

ANNEXURE R75/A – PROJECT SPECIFIC REQUIREMENTS**A1 AREAS OF WORK AND FINISHED SURFACE LEVELS**

NOTES TO TENDER DOCUMENTER: (Delete this boxed text after customising Annexure R75/A)

Complete the tables below by deleting whichever option is not applicable and filling in the required details. If “areas of work” are shown on the Drawings, delete Table R75/A.2 in its entirety.

In Table R75/A.2 below, “Road Reference” can be the road name, control line designation or RoadLoc reference. “From” and “To” can be the road intersection name, chainage or RoadLoc reference.

Table R75/A.1 – Areas of Work and Finished Surface Levels

Clause	Description	Requirement
1.1	Areas of work shown on	Drawings / Table R75/A.2
5.4	Finished surface levels are	shown on Drawings / to match existing surface levels / to be mm above existing surface levels

Table R75/A.2 – Specified Areas of Work

Road Reference	Location		Stabilised Pavement	
	From	To	Width (m)	Thickness (mm)

A2 OTHER PROJECT SPECIFIC REQUIREMENTS

NOTES TO TENDER DOCUMENTER: (Delete this boxed text after customising Annexure R75/A)

Complete the table below by deleting whichever option is not applicable and filling in the required details.

Table R75/A.3 – Other Project Specific Requirements

Clause	Description	Requirement
2.4	Preparation of stockpile site by Contractor	Yes / No
4.1	Minimum Nominated Working Time ⁽¹⁾ hours
4.2.1	Mix design nominated by	Principal / Contractor
2.1, 5.2	Incorporation of patches into pavement course required	Yes / No
5.11.1	Trial section of pavement required	Yes / No
5.13	Application of the following bituminous sealing layer required:	
	Prime	Yes / No
	Primerseal	Yes / No
	Seal	Yes / No
5.13	Application of prime, primerseal or seal to be in accordance with	R106 / R107
7.8	Measurement of ride quality required	Yes / No
	Ride quality incentives/deductions in Table R75/B.2 applicable	Yes / No

Note:

⁽¹⁾ If different to the 6 hours specified in Clause 4.1

A3 ADDITIONAL REQUIREMENTS FOR IMPORTED MATERIAL TO BE BOUND

Refer Clause 2.2.

Insert here any additional requirements for imported MTBB.

A4 PRINCIPAL NOMINATED MIX DESIGN

NOTES TO TENDER DOCUMENTER: (Delete this boxed text after customising Annexure R75/A)

Provide in the table below details of the mix design where the mix design is nominated by the Principal.

Refer Clause 4.2.2.

Table R75/A.4 – Principal Nominated Mix Design Details

Generic Description of Binder	Binder Blend Proportions	Design Binder Application Rate (% by Dry Mass of MTBB)	Nominated Dry Density of MTBB (t/m³)	Nominated Working Time (hours)

ANNEXURE R75/B – MEASUREMENT AND PAYMENT AND DISPOSITION OF NONCONFORMITIES

B1 MEASUREMENT AND PAYMENT

Payment will be made for all costs associated with completing the work detailed in this Specification, excluding removal and disposal of wearing surface and bituminous seal, in accordance with the following Pay Items.

If applicable, removal and disposal of existing wearing surfaces thicker than 80 mm, and asphalt patches will be paid for under TfNSW R101; bituminous seal will be paid for under the pay items in the specification nominated in Annexure R75/A2.

Where no specific pay items are provided for a particular item of work, the costs associated with that item of work are deemed to be included in the rates and prices generally for the Work Under the Contract.

Unless specified otherwise, a lump sum price for any of these items will not be accepted.

Pay Item R75P1 – Insitu Stabilisation

The unit of measurement is the “square metre”.

The quantity is determined by multiplying the stabilised pavement width specified in Annexure R75/A1 by the length of stabilised pavement, including any additional areas such as parking areas, slip lanes, etc directed to be stabilised. No account will be taken of the course thickness tolerances or any overspread of binder or at areas outside of the area specified for treatment.

This Pay Item must cover all costs associated with insitu stabilisation in accordance with the requirements of this Specification, and pre-pulverisation where required.

Pay Item R75P2 – Supply and Spreading of Imported Material To Be Bound

Unless approved otherwise by the Principal, the unit of measurement is the “tonne” of imported Material To Be Bound, as determined by registered weighbridge docketts or other approved method.

Where the Principal approves payment based on a conversion to tonnes from the volume in cubic metres of loose material, the quantity must be confirmed by haulage records that show the following:

- (a) truck driver;
- (b) truck owner;
- (c) truck registration;
- (d) truck tare mass,
- (e) volume capacity (m³);
- (f) date of loading and delivery;
- (g) time of loading and delivery;
- (h) tallyperson’s signature.

This Pay Item covers all costs associated with the supply, stockpiling and haulage of imported Material To Be Bound, spreading of the material on existing pavement, trimming and partial

compaction of the material immediately before stabilisation. The costs of moisture content control and stabilisation of the material are included in Pay Item R75P1.

B2 DEDUCTIONS FOR NONCONFORMITIES AND INCENTIVES

Lots that are nonconforming with respect to compaction or ride quality may be accepted with a deduction to the rate for Pay Item R75P1, as specified hereunder.

The deduction is applied to the quantity of material in the Lot(s) represented by the test results.

(a) Compaction (refer to Clause 7.4.3)

Where the characteristic value of relative compaction of a Lot is nonconforming, deductions in accordance with Table R75/B.1 will apply.

Table R75/B.1 – Deductions for Relative Compaction

Pavement Course Thickness ≤ 250 mm		Pavement Course Thickness > 250 mm	
Relative Compaction ⁽¹⁾	Deduction ⁽²⁾	Relative Compaction ⁽¹⁾	Deduction ⁽²⁾
≥ 101 to < 102%	10%	≥ 98 to < 100%	10%
≥ 100 to < 101%	30%	≥ 95 to < 98%	30%
< 100%	Reject ⁽³⁾	< 95%	Reject ⁽³⁾

Notes:

- ⁽¹⁾ Characteristic value of relative compaction.
- ⁽²⁾ Applied as % deduction to rate for Pay Item R75P1 for quantity represented by test results.
- ⁽³⁾ Rectify, or remove and replace, quantity represented by test results.

In addition, where the course thickness exceeds 250 mm, and the relative compaction calculated for the lower layer is less than 95% at one or more points, the Lot may be accepted but with a deduction of 20% to the rate for pay Item R75P1 for the Lot. This deduction is in addition to the deductions specified in Table R75/B.1.

(b) Ride Quality (refer to Clause 7.8)

Where the NAASRA Roughness value over a 100 m survey interval is less than 65 counts/km, incentives or deductions to the rate for Pay Item R75P1 in accordance with Table R75/B.2 will apply.

Where the NAASRA Roughness value over a 100 m survey interval is equal to or exceeds 65 counts/km (equivalent to IRIs value of 2.5 m/km), the pavement course constructed for that length must be either reworked, or removed and replaced.

Table R75/B.2 – Incentives and Deductions for Ride Quality

NAASRA Roughness (counts/km) over 100 metre length	Equivalent IRI_s (m/km) over 100 metre length	Incentive/Deduction ⁽¹⁾
< 20	< 0.80	+ 3%
20 – 24	0.80 – 0.95	+ 2%
25 – 34	0.96 – 1.35	+ 1%
35 – 39	1.36 – 1.55	Nil
40 – 49	1.56 – 1.95	- 2%
50 – 54	1.96 – 2.10	- 4%
55 – 59	2.11 – 2.30	- 8%
60 – 64	2.31 – 2.50	- 16%
≥ 65	> 2.50	Reject ⁽²⁾

Notes:

- ⁽¹⁾ Applied as % incentive or deduction to rate for Pay Item R75P1 for quantity represented by test results.
- ⁽²⁾ Rectify, or remove and replace, quantity represented by test results.

ANNEXURE R75/C – SCHEDULES OF HOLD POINTS, WITNESS POINTS AND IDENTIFIED RECORDS

Refer to Clause 1.2.3.

C1 SCHEDULE OF HOLD POINTS AND WITNESS POINTS

Clause	Type	Description
2.3	Hold	Certification of stockpiles
4.2.3	Hold	Submission of Contractor nominated mix design
5.5.2	Hold	Submission of details of proposed Alternative Construction Method
5.8.1	Hold	Locations and types of construction joints, treatment of overlaps and irregular shaped Lots, locations of unsupported edges and details of rolling pattern
5.11.1	Witness	Construction of trial section of pavement
5.11.1	Hold	Submission of documentation verifying conformity of trial section of pavement
5.13	Hold	Priming, primersealing or sealing of surface of bound pavement course
7.11.1	Hold	Submission of Nonconformity Report and rectification proposal

C2 SCHEDULE OF IDENTIFIED RECORDS

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

Clause	Description of Identified Record
2.3	Certification of stockpiles
3.1.3	Verification records of blended binder proportions
4.2.3	Approved Contractor nominated mix design details
4.3	Supplementary Information and test results
4.4	Variation to approved Contractor nominated or Principal nominated mix design
5.5.2	Details of Alternative Construction Method
5.5.3	Completed Table R75/E.2 and calculations
5.6	Target moisture content envelope
5.8.1	Locations and types of joints, treatment of overlaps and irregular shaped Lots, locations of unsupported edges and details of rolling pattern
5.11.1	Conformity documentation for trial section of pavement
7.2	UCS sampling locations and test results
7.5	Thickness of bound pavement course
7.10	Certificate of conformity

ANNEXURE R75/D – PLANNING DOCUMENTS

Refer to Clause 1.2.4.

The following documents are a summary of documents that must be included in the PROJECT QUALITY PLAN. The requirements of this Specification and others included in the Contract must be reviewed to determine additional documentation requirements.

Clause	Description
2.4	Procedures for construction, operation and restoration of stockpile sites
2.5	Methods to prevent segregation and/or loss of fines during delivery of imported MTBB
3.1.1	Details of cementitious and pozzolanic material, and blend proportions of blended binders if applicable
3.1.3	Method of sampling the delivered binder
3.2	Details of source of water
3.3	Procedure for incorporating retarders within pavement course
3.4	Safety Data Sheets and procedures for safe handling of materials
5.1	Equipment and methods of spreading of binder, mixing with the insitu material, shaping and compacting and trimming. Method of work adjacent to concrete structures
5.2	Method of treatment or removal of existing patches
5.3	Procedures for cessation of operations in the event of adverse weather conditions
5.4	Procedures for spreading MTBB
5.5.1	Procedures for spreading and mixing of binder
5.5.4	Procedures for dealing with spillage of binder and retarder
5.5.5	Method of monitoring of binder spread rate and calibration
5.5.7	Details of the proposed mixing equipment capability
5.5.8	Details of mixing, width of passes and nominated depth
5.6	Procedure for incorporation of water and achievement of uniform distribution of water
5.7	Procedures for compaction
5.8.1	Locations and types of construction joints, treatment of overlaps and irregular shaped Lots, locations of unsupported edges and details of rolling pattern
5.8.4	Details of overlap of joints and/or cutting back of previously stabilised material
5.8.5	Method of disposal of cutback material
5.9.1	Method of trimming and survey control to produce required pavement thickness
5.9.2	Procedure to produce required pavement surface after trimming
5.9.3	Method of trimming and disposal of trimmed waste material
5.10	Procedures for curing
5.12	Procedures for protection of works

Clause	Description
5.13	Procedure to ensure that the finished surface is ready to receive sprayed bituminous seal
6	Method of surveying levels
7.4.1	Method of repairing test holes
7.7	Locations for straight edge measurements.
7.8	Details of equipment for measuring ride quality and calibration data

ANNEXURE R75/E – CONTRACTOR NOMINATED MIX DESIGN

Table R75/E.1 – Contractor Nominated Mix Design Details
(When Mix Design is Nominated by the Contractor – refer to Clause 4.2.3)

Generic Description of Binder	Binder Blend Proportions	Design Binder Application Rate (% by mass ⁽¹⁾)	Nominated Dry Density of MTBB (t/m³)	Nominated Working Time (hours)

Note:

- ⁽¹⁾ Percent by dry mass of MTBB.

Table R75/E.2 – Spreading Details

Pavement Section	Generic Description of Binder	Binder Blend Proportions	Design Target Spread Rate ⁽¹⁾ (kg/m²)	Field Target Spread Rate ⁽²⁾ (kg/m²)

Notes:

- ⁽¹⁾ Calculated using the stabilised pavement thickness, design binder application rate and nominated dry density of MTBB from Table R75/E.1.
- ⁽²⁾ Field Target Spread Rate (kg/m²) is the Design Target Spread Rate plus a tolerance (refer to Clause 5.5.3).

ANNEXURES R75/F TO R75/K – (NOT USED)

ANNEXURE R75/L – MINIMUM FREQUENCY OF TESTING

Clause	Characteristic Tested	Test Method	Minimum Frequency of Testing
2.2	Properties of imported MTBB	TfNSW 3051	As per TfNSW 3051
3.1.1	Quality of binder	TfNSW 3211	As per TfNSW 3211
3.1.2	Proportion of blended binder	Verify proportion of constituents	1 per binder delivery
3.2	Quality of water:		
	Chloride ion concentration	TfNSW T1004	1 per contract per source
	Sulfate ion concentration	TfNSW T1014	1 per contract per source
	Undissolved solids	AS 3550.4	1 per contract per source
	Concentration of thermo-tolerant coliforms	TfNSW T1015	1 per contract per source
3.3	Quality of retarder	Conformity with AS1478 or other standard appropriate to the particular retarder	1 per contract per source
7.2	Unconfined compressive strength	TfNSW T116	As per TfNSW Q for specified relative compaction
7.3	Spread rate	As per Clause 7.3	As per Clause 7.3
7.4.1	Insitu density	TfNSW T173	As per TfNSW Q for specified relative compaction
7.4.2	Maximum wet density	TfNSW T162	As per TfNSW Q for specified relative compaction
7.4.3	Relative compaction	TfNSW T166	As per TfNSW Q for specified relative compaction
7.4.4	Field moisture content	TfNSW T120, T121 or T180	As per TfNSW Q for specified relative compaction
7.5	Pavement course thickness	As per Clause 6.3	At each location as defined in Clause 6.3
7.7	Deviation from straight edge	As per Clause 7.7	Minimum 1 per 20 m ²
7.8	Ride quality	TfNSW T182 or T188	Continuous reading per Lot
7.9	Width	As per Clause 7.9	Minimum of 1 per 20 linear metres

ANNEXURE R75/M – REFERENCED DOCUMENTS

Refer to Clause 1.2.6.

TfNSW Specifications

TfNSW G10	Traffic Management
TfNSW G36	Environmental Protection
TfNSW G38	Soil and Water Management
TfNSW G71	Construction Surveys
TfNSW Q	Quality Management System
TfNSW R101	Cold Milling of Road Pavement Materials
TfNSW R106	Sprayed Bituminous Surfacing (with Cutback Bitumen)
TfNSW R107	Sprayed Bituminous Surfacing (with Polymer Modified Binder)
TfNSW R178	Vegetation
TfNSW 3051	Granular Pavement Base and Subbase Materials
TfNSW 3211	Cements, Binders and Fillers

TfNSW Test Methods

TfNSW T111	Dry Density/Moisture Relationship of Road Construction Materials
TfNSW T116	Unconfined Compressive Strength of Remoulded Road Construction Materials
TfNSW T120	Moisture Content of Road Construction Materials (Standard Method)
TfNSW T121	Moisture Content of Road Construction Materials (Sand Bath or Hot Plate Method)
TfNSW T131	Unconfined Compressive Strength of Road Construction Materials (Blended in the Laboratory with Cementitious Binders)
TfNSW T136	Rate of Spread of Dry Powder Binders
TfNSW T147	Working Time for Road Construction Materials (Blended in the Laboratory with Slow Setting Binders)
TfNSW T162	Compaction Control Test (Rapid Method)
TfNSW T166	Relative Compaction of Road Construction Materials
TfNSW T173	Field Wet Density of Road Construction Materials (Nuclear Gauge in Direct Transmission Method)
TfNSW T180	Moisture Content of Road Construction Materials (Microwave Oven Method)
TfNSW T182	Pavement Surface Roughness
TfNSW T188	Project Ride Quality (Vehicular Laser Profilometer)
TfNSW T1004	Quantitative Determination of Chloride Ion in Water
TfNSW T1014	Quantitative Determination of Sulfate Ion in Water
TfNSW T1015	Microbiology of Water Used in Roadworks (Thermotolerant Coliforms)

Australian Standards

AS 1478	Chemical admixtures for concrete, mortar and grout
AS 3550.4	Waters – Determination of solids – Gravimetric method