

TRANSPORT FOR NSW (TfNSW)

QA SPECIFICATION TfNSW M250

HEAVY PATCHING (FLEXIBLE 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
Ed 1/Rev 0		First edition.	GM, RNIC	06/07/04
Ed 1/Rev 1	3.2.1, 4.1.2 and 4.5.3 B.2	Various amendments. Units of measure changed for item 263. Definitions added or altered.	GM, RNIC	28/01/05
Ed 1/Rev 2	1.1	New clause re intended use.	GM, RNIC	10/08/06
Ed 1/Rev 3	Tables 5.5.2 5.5.3	Corrected table numbering: a) Rev 2 had two Tables M250.3 and b) the table now numbered M250.4 was unnumbered. Corrected cross-references to Tables. Made the requirement that the patch's level matches adjacent pavement specific to <u>undeformed</u> adjacent pavement Made "no ponding" applicable to both deformed and undeformed adjacent pavement.	GM, IC	31.08.07
Ed 1/Rev 4	Most	Format corrected	GM, IC	24.10.07
Ed 1/Rev 5	All 5.10	To match new Maintenance Activities: <ul style="list-style-type: none">• Changed Pay Items• Changed references to other similarly changed specifications Removed Deduction mechanisms Changed internal referencing format Added clause re Accomplishment reporting.	GM, IC	04.08.08

Ed/Rev Number	Clause Number	Description of Revision	Authorised By	Date
Ed 2/Rev 0		General technical review, and revision of some technical requirements. Requirements added for mix design, stockpiling, and construction for modified/bound granular materials which were previously included in RMS 3061. RMS 3061 has been replaced by RMS 3051. Annexure E added. Format revised.	GM, IAM	19.02.13
Ed 2/Rev 1	4.10.3.4 Annex M	Clause reference to spec SI/TCS/8 (withdrawn) replaced with spec TS101. Referenced Documents updated.	MCQ	14.10.19
Ed 2/Rev 2	Global	References to “Roads and Maritime Services” or “RMS” changed to “Transport for NSW” or “TfNSW” respectively.	DCS	22.06.20

GUIDE NOTES
(Not Part of Contract Document)

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 M250

TfNSW M250 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.

M250 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.

DEFINING HEAVY PATCHING LIMITS

The purpose of this section is to assist in determining when a pavement repair should be considered as heavy patching and therefore when this specification should be used.

Pavement repairs will vary from pothole patching (refer M3) to reconstruction works (refer M290). In very general terms, a repair changes from a pothole to a heavy patch when the failed material must be excavated to enhance road user safety and with the intention to repair the defect to a life commensurate with the remaining life of the pavement.

It becomes rehabilitation when there is a significant investment in funds and therefore it is considered that detailed investigation and pavement design is warranted together with a full regime of product and process testing. Rehabilitation will generally provide for a service life in excess of 10 years. Rehabilitation works will typically be larger in size than heavy patching and would not require changes to geometry or formation width.

It becomes a reconstruction when the design provides for a service life typically in excess of 20 years. Reconstruction will address design standards such that the asset can be said to be “recapitalised” when the works are complete.

Both heavy patching and rehabilitation work can be considered generally to be reactive maintenance.

The decision as to whether a repair is a heavy patch or something more should generally be based on whether the cost of detailed investigation, design and works testing is warranted by comparison with the possible costs of premature failure of the repair. It is in effect a risk analysis, and will always be a matter of professional judgement.

While it is not possible to provide a simple checklist for making this judgement, the following table sets out a number of general factors that would normally be taken into consideration.

It is emphasised that each criterion listed in the column headed “Heavy Patch” in Table GN 1 should be preceded by the word “generally”. The final decision will be based on an overall view of all these factors together with any others that might apply in particular situations or locations.

Table GN 1 – Defining heavy patching

Attribute / Characteristic	Heavy Patch	More than a Heavy Patch (Rehabilitation or Reconstruction)
Intended life	Match surrounding pavement, generally < 10 years	Generally: Rehabilitation > 10 years; Reconstruction ≥ 20 years
Investigation/geotech etc.	Generally no – or minimal	Yes
Pavement design	Generic or rule of thumb	Yes

Attribute / Characteristic	Heavy Patch	More than a Heavy Patch (Rehabilitation or Reconstruction)
Testing of materials	Approve source based on past testing and knowledge	Yes
Testing of process	Simplistic – trials and process monitoring	Yes
Response time – safety issue	Short term or part of pavement strategy	Planned
Track performance > 1 yr	Generally no	Yes
Size of repair	Individual or close group of patches:** <ul style="list-style-type: none"> ▪ for AC < 500 m² ▪ for granular < 1,000 m² 	No limit, small or large
Surface Level	Generally Unchanged	May change
Alignment	Unchanged	May change
Peripherals (eg, formation width and drainage)	Unchanged	May change
Confined to traffic lanes	Generally	Not necessarily
Excavation method	Hand, minor plant, major plant	Major plant
Width	Generally ≤ 1 lane	Generally full width or multiple lanes

**Note: these limits in particular are intended as a very general indicator only. They are not in any way binding on specifiers, who should take the whole range of variables into consideration when deciding whether a repair is a heavy patch.

CATEGORIES OF HEAVY PATCHES

Heavy patches may vary in size from less than one square metre to many hundreds of square metres. Construction methods will also vary from hand-tools (shovels and rammers) through small plant (typically backhoe and compactor, or light roller) to major plant (grader, paver, heavy rollers etc.). The size and distribution of the defects will influence the appropriateness and choice of construction equipment. In turn, the achievable quality of the finished patch will be influenced by the construction method.

Heavy patches are categorised according to the construction methods that are practical in each case. The size and distribution of patches will generally dictate the construction methods to be used, and in turn those methods will affect the quality of work that can be achieved.

The specification provides for three categories of heavy patches and construction methods:

- (a) Hand heavy patches (typically shovels and rammers).
- (b) Minor heavy patches (typically back-hoe and vibrating plate or light roller).
- (c) Major heavy patches (typically grader, paver, milling machine, heavy roller).

PLACEMENT TRIALS

When it is proposed to issue Work Orders for a heavy patch, it will be necessary for Placement Trials to be carried out in accordance with the Specification.

For example if it is proposed to order work within all three categories, then three sets of Placement Trials should be carried out.

The aim of Placement Trials is to reduce the amount of testing required throughout the works to a reasonably practicable level. The trials will be monitored and tested and the Contractor will then be accountable to comply with the accepted construction methodology, which will be documented in the Contractor's Quality System.

The Specification makes a clear distinction between testing requirements for Placement Trials and ongoing work. It also allows the Principal to carry out additional testing (at the Principal's cost) whenever the Principal has reason to believe that the quality of work has altered due to any change in construction methods, materials, or service conditions etc.

In some instances, it may be considered desirable to increase the size of a Placement Trial to avoid the necessity for the Contractor to disestablish or incur idle plant costs while awaiting test results and the release of the Hold Point for continuation of heavy patching works. In this event, the Contractor will not be responsible for re-working costs for the work in excess of the minimum Placement Trial requirements. While such a strategy involves the TfNSW in carrying additional risk, it may be considered warranted following evaluation of the overall costs involved.

PAVEMENT DESIGNS AND LAYER THICKNESS

It is expected that normal practice will be to use a number of generic pavement designs for heavy patches, rather than carrying out detailed investigations and designs. These generic sections will be based on average service conditions in a network area, with perhaps minor variations to allow for local conditions.

Where the existing pavement profile is unknown, and/or there is a history of patch failures in an area, some investigation and individual design may be required. The proper methodology for managing the pavement design process is set out in Infrastructure Life Cycle Management System, Technical Procedure ILC-AM-TP3-102 *Management of pavement design*.

The pavement design and patch limits should be based on a consideration of the possibility of further failures developing within or around the patch perimeter as a result of incompatible materials, permeability, and drainage issues.

Designers of heavy patches should always take into consideration the nature of the site and traffic conditions when customising this Specification. For instance, specifying a treatment that must be trafficked at the end of a shift (eg thick asphalt layers which may not cool in time to take traffic, or insitu stabilised granular material which may not have been able to be dried back) may require the Contractor to consider the cost and risk implications, and negotiate with the Principal accordingly.

A review and consideration of drainage aspects is always important. It is essential to keep water out of the pavement structure and to keep the subgrade as dry as possible to maximise its bearing capacity. Consideration should be given to minimising moisture movement vertically into the pavement as well as lateral movement from the adjoining pavement. Transverse and longitudinal permeability reversals can result in "damming" of water either in the surrounding pavement or in the new patch which can lead to accelerated pavement failures. Table drain maintenance minimises water movement into the pavement and along with subsoil drains lowers the water table.

Note that SELECTED MATERIAL has been included in M250 essentially to facilitate the provision of a working platform, which may be necessary in some instances to ensure that new material may be placed and/or the compaction standard is achieved.

A pavement course will typically comprise more than one layer.

The as-constructed thickness of each pavement layer in the heavy patch should generally conform to the requirements shown in Table GN 2:

Table GN 2 – General limits on pavement layer thickness

Material	As-constructed thickness of compacted layer	
	Minimum	Maximum
Unbound and Modified Granular Pavement Material	150 mm	200 mm
Bound Granular Pavement Material	175 mm	250 mm
Selected Material	150 mm	200 mm
Sand Cement Mix for Pavement Subbase	200 mm	300 mm
Asphalt	3.0 times the nominal mix size	5.0 times the nominal mix size

Where a design specifies layer thicknesses and the Contractor proposes to vary these, the Principal may approve a proposal to place alternative layer thicknesses (including at corrections and tie-ins) provided that the proposal includes details of:

- (i) Work methods to ensure that for thinner than specified layers, a dense homogeneous layer free from cracks will be provided.
- (ii) Work methods to ensure that for thicker than specified layers, relative compaction or insitu air voids (whichever is relevant) conform to specified requirements.
- (iii) Proposed maximum and/or minimum layer thickness.
- (iv) Evidence that affected areas are the absolute minimum necessary to conform to the work site constraints and that, as far as possible, the layer thickness conforms to the specified tolerances.

Any changes to the specified layer thicknesses may require further Placement Trials.

PAVEMENT MATERIALS

The pavement materials to be used in patching works must be shown in Annexure A.1.

PAFV FOR SURFACE AGGREGATE

Where considered necessary, the required Polishing Aggregate Friction Value (PAFV) for coarse aggregate in the surface course should be included in Annexure A.

PAFV should be based on individual site assessment. The generally accepted minimum value is 44 for sprayed seals and 48 for asphalt, but in special locations desirable values could range up to about 52. It should be kept in mind that in most situations, the requirement of a high PAFV could result in very substantial increases in cost as special aggregates may have to be imported.

LOCATING PATCHES

The scoping of heavy patching works will include defining the location and size of patches as well as design details such as layer depths. It is important to give serious consideration to size and location, since this will affect the construction methods (and patch category) and in turn the life and performance of the finished product.

As far as possible, multiple small patches should be avoided. It will usually be more cost-effective to maximise individual patch areas since this will minimise patch edges, which are areas of potential weakness due to lower compaction, increased permeability etc. Consideration should be given to not only patching a failed area, but also any adjacent areas showing possible signs of distress which may otherwise result in an early re-visit.

Patch location should always ensure that there are no longitudinal joints in wheel paths.

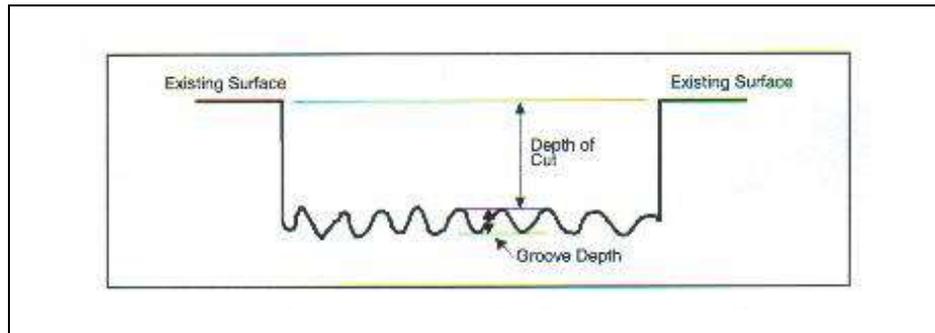
For these reasons it is generally desirable to accurately specify location and patch size by marking out on the pavement and ensuring that the patch boundaries extend into sound pavement. This detail should be provided to the Contractor in the Work Order.

Where the Contractor proposes heavy patching work and specific locations, it is essential to ensure that the Contractor understands these principles and is committed to applying them. Patch locations must always be verified and approved by the Principal and details incorporated in the Work Order.

EXCAVATION DEPTH

The depth of cut must be measured across the cut from adjacent surfaces to the top of the cut groove as shown in Figure GN 1.

Figure GN 1 – Depth of cut



When milling to a surface specified on the Drawings or the Work Order, the top of the milled surface must not vary from the position detailed on the Drawings or in the Work Order by more than the tolerance shown in Table 9 of this Specification.

USE OF GEOTEXTILES

Geotextiles may be used as a strengthening medium over a weak subgrade by providing some tensile capacity, and/or to separate the patch from a wet subgrade to minimise the pumping of fines. They may also be used in the construction of sub-surface drains as a filter barrier.

Table GN 3 indicates the type of geotextile that should be specified for these applications. Note that further guidance is available in TfNSW R63.

Table GN 3 – Specification of geotextile

Applications	Strength*	Filtration Class*
Strengthening and separation layer on weak subgrade: non critical flow conditions	C1	Class 4
Trench drain, edge drain and drainage blanket	B1	Class 1
* Refer to TfNSW R63		



Transport
for NSW

QA SPECIFICATION M250

HEAVY PATCHING (FLEXIBLE PAVEMENT)

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VERSION FOR: DATE:

CONTENTS

CLAUSE	PAGE
FOREWORD	III
TfNSW Copyright and Use of this Document	iii
Revisions to Previous Version	iii
Project Specific Changes.....	iii
1 GENERAL	1
2 PLANNING.....	2
2.1 Project Quality Plan	2
2.2 Location of Work.....	2
2.3 Mix Design (Modified and Bound Granular Materials)	3
2.4 Placement Trials	3
3 RESOURCES	5
3.1 Base Material	5
3.2 Materials for Replacing Unsuitable Material Below the Base.....	7
3.3 Compaction Equipment	8
3.4 Insitu Stabilisation Equipment.....	8
4 EXECUTION.....	8
4.1 Temporary Ramps.....	9
4.2 Excavation	9
4.3 Unsuitable Material.....	9
4.4 General Requirements.....	10
4.5 Material Under Base	14
4.6 Unbound Materials	15
4.7 Bound or Modified Materials	16
4.8 Asphalt Layers	19
4.9 Related Works.....	21
4.10 Protection and Reinstatement of Services, Road Fixtures, and Delineation.....	22
4.11 Opening to Traffic	22
5 CONFORMITY.....	23
5.1 Placement Trials	23
5.2 Continuing Compliance with Approved Construction Processes	25
5.3 Pavement Density	26
5.4 Surface Finish and Segregation	27
5.5 Surface Shape	27
5.6 General Testing Requirements.....	27
5.7 Pavement Course Position	28
5.8 Friction Value of Surface Course Aggregate.....	29
5.9 Warranty Period.....	30
5.10 Accomplishment Reporting	30
ANNEXURE M250/A – DETAILS OF WORK	31
A.1 Material Requirements.....	31
A.2 Pavement Designs.....	32
A.3 Placement Trial Requirements.....	32
A.4 Location and Details of Work.....	33
A.5 Warranty Period.....	33
A.6 Material Details.....	34
A.7 Information for Identification Certificate	35
ANNEXURE M250/B – MEASUREMENT AND PAYMENT	36
B.1 General.....	36

B.2	Schedule of Pay Items	37
ANNEXURE M250/C – SCHEDULE OF HOLD AND WITNESS POINTS AND IDENTIFIED RECORDS		41
C.1	Schedule of Hold Points and Witness Points.....	41
C.2	Schedule of Identified Records.....	41
ANNEXURE M250/D – PLANNING DOCUMENTS.....		41
D.1	Schedule of Key Quality Planning Action Points.....	41
D.2	Supply Method for Pavement Material	43
D.3	Production Using Stationary Plant	43
D.4	Delivery of Pavement Material.....	44
ANNEXURE M250/E – RESURFACING AND HEAVY PATCHING DESIGNS		45
ANNEXURE M250/F – DESIGN DETAILS.....		46
F.1	Information to be Submitted for Nominated Materials	46
F.2	Information to be Submitted for Each Mix Design	46
ANNEXURE M250/G TO L – (NOT USED).....		47
ANNEXURE M250/M – REFERENCED DOCUMENTS AND DEFINITIONS		47
M.1	Referenced Documents.....	47
M.2	Abbreviations and Defined Terms.....	48
LAST PAGE.....		49

FOREWORD

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REVISIONS TO PREVIOUS VERSION

This document has been revised from TfNSW Specification M250 Edition 2 Revision 1.

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:

- Text which is additional to the base document and which is included in the Specification is shown in bold italics e.g. ***Additional Text***.
- 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 M250

HEAVY PATCHING (FLEXIBLE 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 is heavy patching consisting of:

.1 Excavation and preparation of the heavy patch.

.2 Supply and placing of heavy patching materials.

.3 Reinstatement of traffic facilities.

.4 Mix design for modified/bound granular patches. | Scope |
| 1.3 | Heavy patches will be ordered in three categories (hand, minor, and major) as specified in Annexure A.4. | Categories of heavy patches |
| 1.4 | Details of work to be carried out under the Contract are specified in Annexure A. | Details of work |
| 1.5 | 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 B. | Measurement and payment |
| 1.6 | The standards, specifications and test methods referred to by this Specification are referenced using an abbreviated form (eg TfNSW 3051). The titles are given in Annexure M. | Referenced documents |
| 1.7 | Unless otherwise specified, the issue of an Australian Standard or TfNSW Test Method to be used is the issue current one week before closing date for tenders. The TfNSW specification to be used is the issue contained in the contract documentation. | Applicable issue |
| 1.8 | Some words or abbreviations have a special meaning in this Specification and they are explained in Annexure M. These words are highlighted in capitals eg DEFINED TEXT. | Definitions |
| 1.9 | 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 |

- 1.10 Provide the identified records specified in the TfNSW Quality System Specification included in the Contract Documents (TfNSW Q) and summarised in Annexure C.2. **Records**

2 PLANNING

2.1 PROJECT QUALITY PLAN

- 2.1.1 The requirements of the PROJECT QUALITY PLAN are defined in TfNSW Q. In addition, the PROJECT QUALITY PLAN must: **General**
- .1 Address the HOLD and WITNESS POINTS required by this Specification and summarised in Annexure C.1. The PRINCIPAL will consider the submitted documents prior to the release of any HOLD POINT. **Hold and Witness Points**
 - .2 Address each of the construction process requirements listed in this Specification and summarised in Annexure D.1. The construction process must include a detailed process description, and inspection and test plans for the work. The process descriptions must be appropriate for the time allowable before reopening the work to traffic. **Construction process**
 - .3 Include a requirement for the routine submission of conformity data, which will certify compliance of all work and materials to the requirements of this Specification, and include supporting documentation. **Conformity data**
 - .4 Be submitted to the PRINCIPAL at least 5 BUSINESS DAYS prior to commencement of work. **Submission**

- | | |
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| 2.1.2 | <p>Process Held: Commencement of work. HOLD POINT</p> <p>Submission: PROJECT QUALITY PLAN conforming to requirements of Clause 2.1.</p> <p>Release of Hold Point: The PRINCIPAL will consider the submitted documents before authorising the release of the HOLD POINT.</p> |
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2.2 LOCATION OF WORK

Areas of pavement to be heavy patched are specified in Annexure A.

2.3 MIX DESIGN (MODIFIED AND BOUND GRANULAR MATERIALS)

- 2.3.1 The mix design must be approved prior to the use of any mix. **Mix Design (modified and bound granular materials)**
- The mix design may be:
1. Nominated by the PRINCIPAL, or
 2. Proposed by YOU.

- 2.3.2 The PRINCIPAL'S Nominated Mix Design is specified in Annexure A.6. **Principal's mix design**

- 2.3.3 Submit a proposed mix design whenever: **Mix Design nominated by You**
- .1 A Nominated Mix Design is not specified by the PRINCIPAL, or
 - .2 YOU propose to change any aspect of a Nominated Mix Design such as:
 - .1 Type of BINDER and/or chemical additive.
 - .2 Proportions of blended BINDER.
 - .3 Percentage of BINDER and/or chemical additive.
 - .4 Source of supply of any material.

- 2.3.4 The proposed mix design must meet the requirements of Annexure A.6.

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| <p>2.3.5 Process Held: Use of proposed mix design. HOLD POINT</p> <p>Submission: Submit documentation including:</p> <ol style="list-style-type: none">.1 Details listed in Annexure F.2..2 Test results for new pavement material..3 For insitu mixing, test results that verify the proposed BINDER and/or chemical additive is compatible with both existing pavement and new pavement materials. <p>Release of Hold Point: The PRINCIPAL will consider the submitted documents before authorising the release of the HOLD POINT.</p> |
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- 2.3.6 Once the HOLD POINT for the proposed mix design is released, the proposed mix is referred to as the Nominated Mix Design. The procedure for the manufacture of the mix using the Nominated Mix Design must be included in the PROJECT QUALITY PLAN. **Nominated Mix Design**

2.4 PLACEMENT TRIALS

- 2.4.1 The major mechanism for controlling heavy patching will be a PLACEMENT TRIAL(S) followed by conformity to the proven construction procedures(s) as detailed in the PROJECT QUALITY PLAN. **Purpose**
- The PLACEMENT TRIAL must utilise the same type of plant and personnel proposed for use on the applicable PATCH CATEGORY.

- 2.4.2 PLACEMENT TRIALS, if specified in Annexure A.3, must be carried out at the commencement of work to verify the suitability of materials and construction methods to consistently achieve the specified quality of work. A PLACEMENT TRIAL will generally be required for each PATCH CATEGORY and generic design of patch ordered. **When required**
- 2.4.3 The location of each PLACEMENT TRIAL is subject to the agreement of the PRINCIPAL and, subject to conformity with this Specification, will form part of the final work. **Location**
- 2.4.4 The heavy patch must be constructed in accordance with Clause 4 of this Specification. PLACEMENT TRIAL requirements for each PATCH CATEGORY are as specified in Table 1 (note these may comprise one or more locations): **Minimum standards for placement trials**

Table 1 – Minimum trial area and sampling points

Criteria	Patch Category					
	Hand		Minor		Major	
	Asphalt	Granular	Asphalt	Granular	Asphalt	Granular
Area of trial (m ²)	5	5	50	50	200	200
Number of sampling points per layer	2	2	3	3	6	6

- 2.4.5 **Process Held:** Details for PLACEMENT TRIAL. **HOLD POINT**
- Submission:** At least 5 BUSINESS DAYS prior to the proposed trial, details of:
- .1 All nominated materials and mix designs.
 - .2 Trial location.
 - .3 Verification checklists of tests for each layer.
 - .4 Details of the proposed construction procedures.
- Release of Hold Point:** The PRINCIPAL will consider the submitted documents and agree the PLACEMENT TRIAL location, prior to authorising the release of the HOLD POINT.

- 2.4.6 Once the HOLD POINT is released, the proposed construction method becomes the nominated construction method. **Nominated methods**
- 2.4.7 Each PLACEMENT TRIAL must include the random sampling and testing of a single patch or series of separate consecutive patches of similar design totalling at least the trial area. At each sampling point, for each layer, testing is to be undertaken for conformity. The total number of tests taken for the trial on each layer must not be less than the number specified in Table 1. **Random sampling**

- 2.4.8 YOU must prepare a verification checklist of tests required on each layer to meet the conformity requirements for that layer. YOU must be guided by TfNSW Q for setting out the random locations of sampling points and the proposed procedure must be detailed in the PROJECT QUALITY PLAN for other than course position, for which the requirements of Clause 5.7 of this Specification apply. **Verification checklist**

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| 2.4.9 | Process Held: Continuation of heavy patching works after PLACEMENT TRIAL.
Submission: Details of:
1. Construction procedure (if changed from initial submission).
2. Conforming test results of end-product and materials as set out in Clause 5.
Release of Hold Point: The PRINCIPAL will consider the submitted documents prior to authorising the release of the HOLD POINT. | HOLD POINT |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|

- 2.4.10 Thereafter process control will consist of ensuring that the materials and methods conform to those used in the PLACEMENT TRIALS. **Following pavement trail**

- 2.4.11 A mix design is required for bound or modified granular material for Minor and Major patches. A new mix design and PLACEMENT TRIAL is required where the granular material being bound/modified varies from an approved mix. **Mix Design**

3 RESOURCES

3.1 BASE MATERIAL

3.1.1 General

- 3.1.1.1 Pavement materials may include: **Materials**
- .1 Existing base or subbase pavement material.
 - .2 Existing bituminous or asphalt wearing surface.
 - .3 Material supplied by the PRINCIPAL.
 - .4 Material excavated on site.
 - .5 Material supplied by YOU.
- 3.1.1.2 Asphalt patches must be removed and replaced with imported granular material prior to stabilisation/modification. **Asphalt patches**
- 3.1.1.3 Pavement materials modified or stabilised must use the Nominated Mix Design. **Nominated mix design**
- 3.1.1.4 The proportions of blended granular material must be as specified in the Nominated Mix Design and the properties must comply with this Specification. **Granular stabilisation**

3.1.1.5	Where new material is added to existing pavement material and stabilised, the new pavement material must be compatible with the BINDER in the Nominated Mix Design. Where the new material is not compatible with the BINDER, YOU must either propose a different new pavement material or a new mix design with changed BINDER.	Insitu stabilisation with addition of new material
3.1.1.6	Pavement material which is self-cementing and conforms to this Specification may be proposed for Base or Subbase.	Self-cementing pavement material
3.1.1.7	The TARGET MOISTURE CONTENT ENVELOPE must be determined for each pavement material to enable the required compaction. The TARGET MOISTURE CONTENT ENVELOPE must be less than the optimum moisture content.	Target moisture content envelope
3.1.2	Asphalt Dense and open graded asphalt, and stone mastic asphalt, must conform to Specifications TfNSW R116, R117, R119, and R121 or other specifications relevant to the work as specified in Annexure A.1.	Materials
3.1.3	Granular Material	
3.1.3.1	Imported granular material must conform to Specification TfNSW 3051 or other specifications relevant to the work as specified in Annexure A.1.	Materials
3.1.3.2	Every material to be used in the supply of pavement material must be nominated.	Materials nominated
3.1.3.3	Documentation for each nominated material must be submitted to the PRINCIPAL and include:	Documentation to be submitted
.2	.1 Details listed in Annexure F.1. .2 Evidence that the quantity of material proposed is sufficient for the work. .3 Where a Nominated Mix Design is specified by the PRINCIPAL, the details listed in Annexure F.2. .4 Testing certifying that the nominated materials comply with this Specification.	
3.1.4	Binder For Modified and Bound Material	
3.1.4.1	BINDER must conform to Specification TfNSW 3211 or other specifications relevant to the work as specified in Annexure A.1.	Materials
3.1.4.2	Any BINDER more than three months older than its date of manufacture must not be used unless it has been retested and certified to comply with this Specification.	Age of binder

3.1.4.3	BINDERS must be: .1 Transported in watertight containers. .2 Protected from moisture until used. .3 Free of any caked or lumpy materials.	Binder requirements
3.1.4.4	Blended BINDERS must be uniformly mixed prior to delivery.	Blended binders
3.1.4.5	YOU may propose an alternative BINDER as part of a proposed mix design.	Alternative binders
3.1.5 Chemical Additives		
3.1.5.1	Chemical additives must conform to the requirements specified in Annexure A.1.	Materials
3.1.5.2	Use the chemical additive and application rate as specified in Annexure A.6.	Verification
3.1.5.3	The chemical additive must be certified as conforming to the manufacturer's specification.	Certified
3.1.5.4	Chemical additives must be: .1 Uniformly blended prior to delivery. .2 Transported and stored in watertight containers. .3 Free of any caked or lumpy materials. .4 Where supplied as a powder, protected from moisture until used. .5 Where supplied as a liquid, thoroughly agitated prior to use.	Chemical additives requirements
3.1.6 Water		
3.1.6.1	Water must be free from amounts of materials harmful to the production or construction processes or the environment (e.g. oils, salts, acids, alkalis, vegetable residue, etc) and must conform to the requirements of Table 8.	Water quality
3.1.6.2	Water from a town water supply does not require testing.	Town water source
3.2 MATERIALS FOR REPLACING UNSUITABLE MATERIAL BELOW THE BASE		
	The SELECTED MATERIAL used to replace unsuitable material below the base is specified in Annexure A. The requirements are summarised in Table 2.	Requirements

Table 2 – Materials for use below the base

Material Type	Requirement
Sand cement mix	Mix proportion of 8:1 Sand to Cement mix, with a moisture content of approximately 8% and to suit compaction, freshly plant mixed, and delivered to site in a transit mixer not more than 45 minutes after batching.
Cement bound granular material	Granular pavement material, stabilised with 4% GP cement, with a moisture content of approximately 8% and to suit compaction, and freshly plant mixed.

3.3 COMPACTION EQUIPMENT

3.3.1 Compaction equipment must be in good mechanical condition and:

General

- .1 Must not spill or leak engine or transmission fluid.
- .2 Must be capable of braking and changing direction smoothly.

3.3.2 Asphalt must be compacted by self-propelled rollers equipped to deliver variable compactive effort. Where compaction by self-propelled roller is impractical, vibrating plates must be used. Compaction equipment must be equipped with operational mechanisms to eliminate pick-up and carry over on drums or tyres.

Compaction of asphalt

3.4 INSITU STABILISATION EQUIPMENT

3.4.1 BINDER must be spread by vehicles fitted with load cells or other form of weighing system capable of providing a continuous record of the rate at which the BINDER is being applied. Other types of spreading equipment may be accepted provided YOU can demonstrate the nominated spread rate can be achieved uniformly during the spreader run.

Spreading binder

3.4.2 Mixing equipment must be purpose built for the process of insitu mixing of road making materials. The equipment used must be capable of both mixing to the depth specified for the layer and for distributing moisture and the BINDER uniformly throughout the full depth and over the whole area of the layer. Profilers or milling machines must not be used for insitu stabilisation.

Purpose built mixing equipment

3.4.3 Mixing blades or tines must be replaced as they wear so as to maintain mixing efficiency consistent with that demonstrated during the construction of the PLACEMENT TRIAL.

Mixing blades

4 EXECUTION

These requirements apply to all works including the PLACEMENT TRIALS unless otherwise stated.

4.1 TEMPORARY RAMPS

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|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| 4.1.1 | Temporary longitudinal ramps which are constructed for the safe trafficking of the work may be required where work is staged or otherwise remains incomplete under traffic. They must be comprised of sound material, which is trafficable in all weather conditions. | Temporary ramps may be required |
| 4.1.2 | The length and grade of temporary ramps must be as follows: <ul style="list-style-type: none"> .1 Speed Limit greater than 60 kph – 2.5 m for each 50 mm of patch depth. .2 Speed Limit less than or equal to 60 kph – 1.5 m for each 50 mm of patch depth. | Length and grade |

4.2 EXCAVATION

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|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| 4.2.1 | All patches must be excavated and trimmed to provide a sheer vertical face of at least 40 mm depth below the pavement surface. The top of the excavated surface must not vary from the position detailed in Annexure A.2 by more than the tolerance shown in Table 9. | Limits of patch |
| 4.2.2 | When constructing a patch which adjoins an existing patch, the vertical face of the existing patch must be cut back to a minimum of 100 mm. When the pavement material is asphalt or BOUND MATERIAL, the vertical face must be cut by saw, jackhammer, or by milling. | Adjoining patches |

4.3 UNSUITABLE MATERIAL

- | | | |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| 4.3.1 | Assess the suitability of the material below the base in accordance with the procedures included in the PROJECT QUALITY PLAN. | Assess existing material |
| 4.3.2 | Any weakened planes of asphalt, concrete and/or base course, or any unsuitable material existing below the specified excavation depth must be removed. The material below the base must provide a firm, level working platform on which to construct the base. | Unsuitable material |
| 4.3.3 | Where the treatment involves a utility or drainage line, the relevant authority must be advised immediately. Work cannot proceed until a clearance has been issued by the relevant authority. Such details must be recorded. | Action involving a utility or drainage line |
| 4.3.4 | Process: Assessment of working platform.
Submission: Notification of the time and date of excavation at least 3 BUSINESS DAYS prior to work starting. | WITNESS POINT |
| 4.3.5 | Notify the PRINCIPAL immediately where the proposed treatment is not appropriate for the site conditions found. | Proposed treatment deemed unsuitable |

4.3.6 Where the proposed treatment involves extra work and the PRINCIPAL is unavailable, YOU must: **Where Principal is unavailable**

- .1 Record the time that YOU attempted to notify the PRINCIPAL.
- .2 Record the assessment.
- .3 Take samples to represent the unsuitable material.

4.3.7 One of the following actions must then be taken and the PRINCIPAL must be informed of the action taken and its justification as soon as possible: **Required actions**

- .1 Where the proposed treatment can be completed within the time constraint, YOU must proceed with the proposed treatment.
- .2 Otherwise, cease operations and make the site safe and, where required, trafficable.

4.4 GENERAL REQUIREMENTS

4.4.1 Placement

4.4.1.1 YOU must place and finish pavement layers to:

- .1 Prevent segregation or loss of material. Areas of segregated material must be removed and replaced with acceptable material prior to compaction.
- .2 Produce a product which is uniform within each layer and between joints and edges.
- .3 Prevent slurring of the surface (granular materials).
- .4 Prevent the development of laminations in the pavement between or within layers.
- .5 Achieve the conformity criteria specified in Clause 5.
- .6 Protect the work until the new layer has developed sufficient strength to carry traffic without damage to the work.

General requirements for pavement layers

4.4.1.2 The placement of any pavement material must not proceed during heavy rain or when rain appears imminent.

Rain

4.4.1.3 Details of procedures and equipment to be used for the protection of work and procedures for working up to concrete structures such as a bridge or concrete median must be submitted as part of the PROJECT QUALITY PLAN.

Protection of work

4.4.2 Contractor's Supply or Supply and Delivery Method (Granular Material)

4.4.2.1 The delivery of pavement material must be regular and at the rate specified in Annexure A.1.

Rate of delivery

<p>4.4.2.2 Delivery vehicles must:</p> <ol style="list-style-type: none"> .1 Have the load covered to stop loss of material or moisture. .2 Drive only where directed. .3 Have special features where specified in Annexure A.1. 	Delivery vehicles
<p>4.4.2.3 Delivery vehicles used to deliver pavement materials to a spreader must be capable of direct discharge into the hopper without spillage or segregation of material.</p>	Delivery to spreader
<p>4.4.2.4 When delivering pavement materials, include on the identification certificate the information required in Annexure A.7.</p>	Identification certificate
<p>4.4.2.5 The PROJECT QUALITY PLAN must document the procedures, and inspection and test plans to be used for supply, or, supply and delivery of, pavement material.</p>	Proposed method
<p>4.4.2.6 Process Held: Supply of, or where specified, supply and delivery of, pavement material, whenever:</p> <ol style="list-style-type: none"> .1 A new method is proposed, or .2 Any aspect of a Nominated Method is changed. <p>Submission: The amended PROJECT QUALITY PLAN containing the detailed procedures, and inspection and test plans for:</p> <ol style="list-style-type: none"> .1 Supply of pavement material (details outlined in Annexure D.2). .2 Plant mixing of pavement material (details outlined in Annexure D.3). .3 Delivery of pavement material (details outlined in Annexure D.4). <p>Release of Hold Point: The PRINCIPAL will consider the submitted documents before authorising the release of the HOLD POINT.</p>	HOLD POINT
<p>4.4.2.7 Once the HOLD POINT is released, the proposed method becomes the Nominated Method.</p>	Nominated method
<p>4.4.2.8 Material delivered for use on the site must be:</p> <ol style="list-style-type: none"> .1 From a CERTIFIED STOCKPILE according to Clause 4.4.4, or .2 Tested and meet the conformity criteria in Clause 5. <p>The PRINCIPAL is entitled to stop delivery whenever the material does not conform to this Specification, including segregated, non-uniform, contaminated, or outside the TARGET MOISTURE CONTENT ENVELOPE.</p>	Delivery for immediate use
<p>4.4.2.9 Supplied pavement material must have a moisture content within the TARGET MOISTURE CONTENT ENVELOPE specified in Clause 3.1.1.7. Moisture must be uniformly distributed through the pavement material.</p>	Moisture content

- 4.4.2.10 All materials supplied must be sampled and tested. Nonconforming material must be promptly removed. **Sampled and tested**

4.4.3 Stockpiling (Granular Material)

- 4.4.3.1 Pavement materials must be stockpiled at the location nominated by the PRINCIPAL or proposed by YOU. **Location**

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|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 4.4.3.2 | Process Held: Construction of stockpile sites.
Submission: Submit documentation including:
.1 Proposed location of stockpile.
.2 Environmental assessment and necessary approvals.
Release of Hold Point: The PRINCIPAL will consider the submitted documents before authorising the release of the HOLD POINT. | HOLD POINT |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|

- 4.4.3.3 The stockpile site must be prepared by YOU unless otherwise specified in Annexure A.6. **Preparation**
- Where the PRINCIPAL is responsible for preparing the stockpile site, YOU must give the PRINCIPAL at least five BUSINESS DAYS notice of commencing delivery.

- 4.4.3.4 Stockpile sites must be: **Construction**
- .1 Clear of all vegetation.
 - .2 Shaped to be free draining.
 - .3 Compacted to provide a base that does not heave or shove under construction vehicles.

- 4.4.3.5 Install and maintain appropriate environmental controls at all stockpile sites for the duration of the contract. **Environmental controls**

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| 4.4.3.6 | Process Held: Delivery of material to a stockpile site constructed by YOU.
Submission: Documentation verifying that the stockpile site conforms to this Specification.
Release of Hold Point: The PRINCIPAL will consider the submitted documents before authorising the release of the HOLD POINT. | HOLD POINT |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|

- 4.4.3.7 Clearly signpost all stockpiles to identify: **Signpost stockpile**
- .1 The unique stockpile identification code.
 - .2 The amount and type of material.
 - .3 Status of testing or conformity of the material.

4.4.3.8	The pavement material must be managed so that a stockpile: .1 Is constructed in horizontal layers with additional layers being fully contained on the underlying layer. .2 Contains one type of material with a maximum LOT size of 4,000 tonnes. .3 Is not contaminated by material from other stockpiles. .4 Remains sufficiently damp to avoid loss of fines. .5 Is uniform in shape, .1 Less than 4 m high. .2 With side slopes between 3H:2V and 3H:1V. .3 Not cone shaped. .6 Meets any additional requirements specified in Annexure A.1.	Stockpile management
4.4.3.9	Material handling at stockpiles must ensure uniformity and avoid segregation or contamination.	Material handling
4.4.3.10	Where pavement material is delivered to a site stockpile, the material must be sampled within three days of completing the stockpile.	Sampling site stockpile
4.4.4	Certified Stockpile (Granular Material)	
4.4.4.1	All stockpiles used for storing pavement material to be used in the work must be CERTIFIED STOCKPILES unless otherwise specified in Annexure A.1.	Certified Stockpiles
4.4.4.2	A CERTIFIED STOCKPILE must meet all the requirements specified for stockpiles in Clause 4.4.3.	Certified stockpile requirements
4.4.4.3	Only add new material to a CERTIFIED STOCKPILE when the new material is: .1 Tested and conforms to this Specification prior to delivery. .2 Of the same type as the CERTIFIED STOCKPILE. Submit test results to the PRINCIPAL verifying the conformity of all additional material added to a CERTIFIED STOCKPILE.	Additional material

4.4.4.4	<p>Process Held: Supply of material from stockpile.</p> <p>Submission: Submit the following documents to verify that the material in the identified stockpile meets the requirements of this Specification:</p> <ol style="list-style-type: none"> .1 Unique identification code and location of stockpile. .2 Quantity of material represented. .3 Test results conform to Clause 5. .4 A checklist confirming that each item for the material listed in Annexure F.1 and, where applicable, Annexure F.2, conforms to this Specification. <p>Release of Hold Point: The PRINCIPAL will consider the submitted documents before authorising the release of the HOLD POINT.</p>	HOLD POINT
4.4.4.5	<p>Where the Nominated Method includes supply of pavement material from a source that is not a CERTIFIED STOCKPILE, sampling at the point of delivery must be according to the procedures included in the PROJECT QUALITY PLAN.</p>	Sampling at the point of delivery
4.4.5 Plant Mixing (Granular Material)		
4.4.5.1	<p>Clause 4.4.5 applies to any pavement material mixed in a dedicated stationary plant including:</p> <ol style="list-style-type: none"> .1 Granular stabilisation. .2 Modification or stabilisation. .3 Chemical modification. 	Dedicated stationary plant
4.4.5.2	<p>The plant must mix pavement material and, where required, BINDER or chemical additives and water, in the required proportions to produce the specified pavement material. Operate the plant according to the manufacturer's recommendations.</p>	Mixing plant
4.4.5.3	<p>The plant used to incorporate BINDER must be capable of measuring the materials incorporated in the mix to an accuracy $\pm 0.3\%$ of the dry mass of the granular material.</p>	Measurements
4.4.5.4	<p>Pavement material must be discharged from the plant to a timed discharge hopper or to a storage bin. This material must not be dropped from a height exceeding 4 m.</p>	Discharge
4.5 MATERIAL UNDER BASE		
4.5.1	<p>Where excavation of unsuitable material below the base is required, unsuitable material must be excavated and replaced with SELECTED MATERIAL.</p>	Remove unsuitable material
4.5.2	<p>Unsuitable material below the base must be treated according to Annexure A and Clause 3.2</p>	Treatment of unsuitable material
4.5.3	<p>All replaced material (SELECTED MATERIAL) must be well compacted to create a firm and even course under the base. Material near fixed surfaces must similarly be well compacted.</p>	Compaction

- 4.5.4 Where a sand cement mix is used it must be compacted using at least 3 passes with a vibrating plate compactor. **Sand cement mixes**
- 4.5.5 Sand cement mix must not be spread when the temperature measured at a depth of 50°mm in the pavement is below 10°C or the air temperature measured in the shade is above 40°C. Sand cement mix must not be used if the material temperature at the point of discharge from the transport vehicle is less than 10°C or more then 32°C. **Climatic constraints**
- 4.5.6 Preparation of the pavement must be completed prior to tackcoating and placing asphalt base pavement material and must include cleaning the surface such that it is free of loose stones, dirt, or foreign materials. **Preparation of underlying surface**
- Where the underlying SELECTED MATERIAL or subbase layer does not have a bituminous seal, the layer must be dampened by frequent uniform applications of water which are light enough to produce no significant run off immediately prior to spreading new material.

4.6 UNBOUND MATERIALS

- 4.6.1 YOU must develop a work method and TARGET MOISTURE CONTENT ENVELOPE that will ensure there is adequate moisture to achieve the specified compaction and that the road is available to be trafficked without shoving, ravelling, or rutting on completion of compaction. The moisture contents must be within the TARGET MOISTURE CONTENT ENVELOPE. **Moisture content**
- 4.6.2 Compaction must be a continuous operation and must commence as soon as practicable after spreading the new material. Moisture must be uniformly distributed within each layer at the time of compaction. The full depth of the material must be compacted over the entire area of placement. **Compaction**
- 4.6.3 Trimming must be undertaken on completion of compaction to produce a surface parallel to the finished wearing surface. **Surface produced**
- 4.6.4 No padfoot marks must remain on the pavement surface after final trimming. **No padfoot marks**
- 4.6.5 All trimming must involve cutting to waste. Material that has been cut to waste must not be incorporated into subsequent pavement layers. **Cut to waste**
- 4.6.6 Where the unbound layer has become wet to an extent that it exceeds optimum moisture content, dry the material back before opening to traffic. **Protection of work**
- 4.6.7 Details of the procedure to be followed to incorporate and achieve uniform distribution of water must be included in the PROJECT QUALITY PLAN. **PQP**

4.7 BOUND OR MODIFIED MATERIALS

4.7.1 Climatic Constraints

4.7.1.1 Bound or modified granular material must not be spread when the temperature measured at a depth of 50 mm in the pavement is below 10°C or the air temperature measured in the shade is above 40°C. **Bound or modified materials**

4.7.1.2 Insitu stabilisation works must not proceed during: **Insitu stabilisation works**

- .1 Periods when the wind is sufficiently strong to cause particles of BINDER to become air-borne.
- .2 Conditions that may cause nuisance or danger to people, property, or the environment.

4.7.2 Application of Binder

4.7.2.1 YOU must determine the spread rate of BINDER required to achieve the nominated percentage of stabilising agent. **Binder spread rate**

The Nominated Mix Design nominates the percentage content of BINDER to be incorporated. The nominated percentage of BINDER must be used to determine the NOMINATED APPLICATION RATE.

The TARGET APPLICATION RATE of BINDER is the NOMINATED APPLICATION RATE plus an allowance to ensure that the nominated BINDER content is achieved.

4.7.2.2 Spreading must be visually uniform throughout each spreader run. **Visually uniform**

4.7.2.3 Any proposed method for incorporation of the BINDER, other than spreading on the pavement in advance of specialised mixing equipment, is classed as an alternative construction method. **Application of binder**
Alternative construction methods are subject to the requirements of Clause 2.4.

4.7.2.4 **Process:** Use of alternative construction methods. **HOLD POINT**

Submission: Details of the process, and inspection and test plan for incorporation of the BINDER, and documents verifying calibration.

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

4.7.2.5 The detailed process description, the method by which the spread rate of BINDER will be continuously monitored, including details of the calibration method proposed, must be included in the PROJECT QUALITY PLAN. **PQP**

4.7.2.6 Where the TARGET APPLICATION RATE exceeds 20 kg/m², spread and mix the BINDER in a minimum of two passes. Divide the BINDER equally between the two passes. **Minimum spreading runs**

4.7.3 Verification of Binder Spread Rate

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|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| 4.7.3.1 | Maintain a record of spread rate monitoring data and associated calibration data, for each continuous spreader run. The spread rate monitoring data submitted to the PRINCIPAL must include details defining the location (chainage and offset of start and finish) of each spread and the patch location. | Monitor spread rates |
| 4.7.3.2 | Data for each spread must include the calculated rate per spread achieved, expressed as a percentage of the nominated rate per spread rounded to the nearest whole number. Values less than 100% must be highlighted. | Highlight values less than 100% nominated spread rate |
| 4.7.3.3 | Where the spread rates (kg/m ²) calculated for a spreader run include one or more lengths in which the spread rate is less than the nominated spread rate, extra BINDER must be spread to achieve the nominated spread rate allowing for the completion of mixing, compaction and testing within the ALLOWABLE WORKING TIME. | Where spread rates less than nominated |
| 4.7.3.4 | For each day's production, record at the end of the day the total tonnage of BINDER used together with the area modified or stabilised. | Record quantity of binder used |

4.7.4 Insitu Mixing

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|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| 4.7.4.1 | The resultant mix must be uniform over the full depth of the layer, with no lenses, pockets, lumps or granules of either incompletely mixed pavement material or incompletely mixed BINDER present. | Requirements for resultant mix |
| 4.7.4.2 | A minimum of two passes of the mixing equipment is required. | Number of runs |
| 4.7.4.3 | Minimise disturbance of unmixed BINDER spread in advance of the mixing process. Traffic or equipment not involved in spreading or mixing of the BINDER must not pass over the spread material prior to the completion of mixing. Any spillage of the BINDER on site or at any loading location related to the site must be removed as soon as possible and not later than 24 hours. | Minimise disturbance |
| 4.7.4.4 | Each mixer run must overlap the previous adjacent longitudinal run by at least 75 mm. | Overlap runs |
| 4.7.4.5 | Where indicated by test results or visual inspection that the BINDER is not uniformly mixed with the existing pavement material and/or the moisture distribution throughout the layer is variable, YOU must carry out additional passes with the mixing equipment to achieve uniformity of: | Carry out additional passes |
| | .1 The materials being modified or stabilised. | |
| | .2 The distribution of the BINDER. | |
| | .3 The distribution of the added moisture. | |

- 4.7.4.6 The details of mixing together with the proposed width of passes and the nominated depth of mixing must be included in the PROJECT QUALITY PLAN. Neither the minimum number of passes of the mixing equipment nor the nominated depth of mixing must be altered without the approval of the PRINCIPAL. **PQP**
- 4.7.4.7 Where the total amount of BINDER is spread in a single pass, carry out all mixing passes to the required depth. **Minimum mixing runs**
- Where the BINDER is spread in two or more passes, the BINDER spread in the first pass must be mixed to 85% +/- 5% of the required depth. The remaining BINDER must be mixed to the required depth in the second and any successive mixing pass(es).
- 4.7.5 Moisture Content**
- 4.7.5.1 Develop a work method and TARGET MOISTURE CONTENT ENVELOPE that will ensure there is adequate moisture to achieve the specified compaction and that the road is available to be trafficked without shoving, ravelling, or rutting on completion of compaction. **Target moisture content**
- 4.7.5.2 Water must be added during the mixing process so that, at the time of completion of mixing, the modified or stabilised material has uniformly distributed moisture content. The moisture contents must be within the TARGET MOISTURE CONTENT ENVELOPE. **Uniformly distributed moisture**
- 4.7.5.3 Details of the procedure to be followed to incorporate and achieve uniform distribution of water must be included in the PROJECT QUALITY PLAN. **PQP**
- 4.7.6 Joints**
- 4.7.6.1 The layout of all joints must conform to the following requirements: **Layout of joints**
- .1 Materials must be spread in a manner that minimises the number of joints.
 - .2 Transverse joints must be formed at right angles to the road centreline.
 - .3 Longitudinal joints must not be located in wheel paths.
- 4.7.6.2 The minimum distances for cutting back previously compacted material are: **Minimum distance for cutting back**
- .1 75 mm along longitudinal joints.
 - .2 0.5 m at transverse joints.

- 4.7.6.3 Joints must be deemed to be fresh when the pavement materials on both sides of the joint have been placed and compacted within the ALLOWABLE WORKING TIME of the first placed material.
- Where a fresh longitudinal joint between adjacent runs is to be compacted, the outside 300 mm of the first placed material must be left uncompacted until the adjacent material is ready for compaction. The joint must be kept moist during this period.
- Fresh joints**
- 4.7.7 Compaction and Curing**
- 4.7.7.1 Compaction must be a continuous operation and must commence as soon as practicable after spreading the new material or after incorporation of the BINDER. Moisture must be uniformly distributed within each layer at the time of compaction. The full depth of the material must be compacted over the entire area of placement. All activities associated with compaction and primary trimming must be completed within the ALLOWABLE WORKING TIME of the material. Final trimming must be completed within the NOMINATED WORKING TIME of the material.
- Continuous operation**
- 4.7.7.2 Trimming must be undertaken on completion of compaction to produce a surface parallel to the finished wearing surface.
- Produce level surface**
- 4.7.7.3 No padfoot marks must remain on the pavement surface after primary trimming.
- No padfoot marks**
- 4.7.7.4 All trimming must involve cutting to waste. Material that has been cut to waste must not be incorporated into subsequent pavement layers.
- Cut to waste**
- 4.7.7.5 Curing to protect the material against rapid drying out must commence immediately after compaction is completed. During curing, the surface must be kept continuously damp until covered.
- Curing**
- 4.7.7.6 Curing must consist of frequent uniform applications of water which are light enough to produce no significant run off. Water must be applied in such a manner that slurring of the surface, pavement instability, erosion, or leaching of the BINDER does not occur.
- Applying water**
- 4.7.7.7 Details of the YOUR procedures for complying with the requirements for curing must be submitted as part of the PROJECT QUALITY PLAN.
- Include details in PQP**
- 4.8 ASPHALT LAYERS**
- 4.8.1 Tackcoating must be applied to the vertical sides of the patch and over existing asphalt surfaces or trafficked seals. It must not be applied in situations where it will be picked up by traffic or construction equipment. Where applied, it must conform to the following requirements:
- Tackcoating**

- .1 The residual bitumen from the tackcoat must be evenly spread over the surface at an application rate nominated by YOU which must be between 0.15 and 0.30 litres per square metre.
- .2 All contact surfaces of kerbs and gutters and cold joints must be coated with residual bitumen at an application rate double that nominated above.
- .3 The tackcoat must be applied by mechanical sprayer with a spraybar except that hand spraying is permitted on areas which are difficult to access. Tackcoat that has ponded must be removed or suitably dispersed by brooming.
- .4 The tack coat must be fully broken, free of surface water, and intact before the commencement of asphalt laying.

4.8.2 Asphalt must not be placed when the underlying pavement is wet.

Do not commence placing asphalt, unless the pavement surface temperature complies with the requirements in Table 3.

**Climatic
constraints**

Table 3 - Pavement Temperature and weather conditions

Wind Speed (km/h)	Minimum Pavement Surface Temperatures (°C)		
	Dense Grade		Open Grade and SMA
	Nominal size less than 20mm	Nominal size greater than 20mm	All Sizes
0 - 5	8 and rising	4 and rising	13 and rising
6 - 10	15	10	20
11 - 15	20	15	25
>15	25	20	30

4.8.3 Asphalt must be placed by a mechanical process, which minimises handling and segregation of uncompacted asphalt.

**Minimise handling
and segregation**

4.8.4 Hand placement of asphalt must only be used for minor correction of the existing surface and in areas where placement by mechanical means is impracticable.

Hand placement

4.8.5 Asphalt must be placed and compacted within the range of temperatures specified in the manufacturer's written recommendations. YOU must prepare and submit a concise table of process temperatures that YOU propose to adopt for the works as part of the PROJECT QUALITY PLAN.

**Temperature of
asphalt**

The temperature of asphalt must be measured immediately prior to placing. A suitable stem type thermometer readable and accurate to within plus or minus 2°C with a range from at least 0°C to 200°C or a hand held or machine mounted infrared thermometer readable and accurate to within plus or minus 2°C must be used. Take measurements at the discharge point from a tipper truck or at the distribution auger on the paver. The average of two readings must be adopted as the temperature of the asphalt.

4.8.6	That part of any truckload which contains lumps of cooled asphalt must not be used in the work.	Remove cooled asphalt
4.8.7	Compaction must be a continuous operation and must commence as soon as practicable after laying the new asphalt. The full depth of the material must be compacted over the entire area of placement. All activities associated with compaction must be completed within the manufacturer's recommended working temperature for the asphalt.	Compaction must be a continuous operation
4.8.8	All joints must be densely compacted. Surface courses must be finished with a smooth planar surface, coinciding with the surface of surrounding pavement and satisfying the surface shape requirement specified in Clause 5.5.2. Joints must be constructed by: <ul style="list-style-type: none"> .1 Providing a positive bond between adjacent materials and removing uncompacted or cracked material at the edge of the existing pavement prior to placing the asphalt. .2 Making allowance for thickness reduction as compaction of the layer proceeds. .3 Pushing back any overlap material with lutes to align with the joint line between new and existing pavement. Broadcasting of overlap material is not acceptable and excess material must be removed from the work. .4 Compacting the finished surface joint by successive overlap of the roller drum onto the new mat prior to compacting the remainder of the mat. 	Requirement for joints
4.8.9	If specified in Annexure A.4, joints between the heavy patch and adjacent pavement must be treated as for crack sealing in accordance with Specification TfNSW M211.	Sealing joints
4.9 RELATED WORKS		
4.9.1	The use of geotextiles must conform to the requirements of Specification TfNSW R63.	Geotextiles
4.9.2	Install subsurface drains in accordance with the requirements of Specifications TfNSW R33, R37 and/or R38 (as applicable to the work specified).	Subsurface drains
4.9.3	The use of primes, primerseals and seals must conform to the requirements of Specifications TfNSW R106, R107 or R111 (as applicable to the work specified).	Primes, primerseals and seals

4.10 PROTECTION AND REINSTATEMENT OF SERVICES, ROAD FIXTURES, AND DELINEATION

- | | | |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| 4.10.1 | Take all necessary precautions to prevent patching materials including tackcoat used on the work from entering or adhering to surrounding pavement, drainage structures, and other road fixtures. | Prevent disturbance of materials |
| 4.10.2 | Immediately after the heavy patch is complete, clean off or remove any such material and leave the services and road fixtures in a satisfactory condition. | Clean off and remove unwanted materials |
| 4.10.3 | Road fixtures and delineation must be reinstated in accordance with the following requirements: | Road fixtures |
| .1 | Guide posts in accordance with Specification TfNSW M600 Clause 4.610. | Guide posts |
| .2 | Signposting in accordance with Specifications TfNSW R143 and TfNSW 3400. | Signposting |
| .3 | Pavement marking and raised reflective pavement markers in accordance with Specifications TfNSW R145 and TfNSW R142. Provide temporary delineation using a removable paint system that does not damage the pavement, temporary tapes, or stick and stomps, which must be maintained until permanent pavement marking is completed. | Pavement marking |
| .4 | Traffic signal detector loops and other traffic facilities loops in accordance with Specification TfNSW TS101 within a timeframe as agreed with the PRINCIPAL. | Traffic signal detector loops |
| .5 | Private entrances in accordance with M1 Clause 4.5.5. | Private entrances |

4.11 OPENING TO TRAFFIC

- | | | |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| 4.11.1 | Prior to opening of the heavy patch to normal traffic, YOU must ensure that: | Requirements |
| .1 | All loose material in the patch and immediately adjacent to the work is removed. | Loose material |
| .2 | Temporary ramps are installed on unfinished works in accordance with Clause 4.1. | Temporary ramps |
| .3 | Delineation and signposting for traffic and pedestrian management are in accordance with the Work Order or other requirements of the Contract. | Delineation and signposting |
| .4 | Arrangements are in place to remove all plant, equipment, and excess materials from the vicinity of the works. | Remove excess resources |
| .5 | The surface temperature of asphalt must be less than 60°C. | Asphalt temperature |

- | | | |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| 4.11.2 | A checklist must be completed and endorsed verifying that materials and process are in accordance with this Specification | Complete and
authorise checklist |
| 4.11.3 | All loose material generated by trafficking of the patch, either in a finished or partly finished state, must be promptly removed for a period of up to 48 hours after opening to traffic. | 48 hour period
after opening |

5 CONFORMITY

5.1 PLACEMENT TRIALS

5.1.1 Reporting Requirements

- 5.1.1.1 Ensure the layer is homogenous as defined in TfNSW Q. Each patch must be assessed for compaction at the completion of trimming and must be within any ALLOWABLE WORKING TIME.
- 5.1.1.2 A smooth surface must be provided at each sampling location for obtaining samples. The location of the sample for the laboratory determination of the maximum wet or dry density must be the same as for the insitu density. Holes must be repaired using freshly mixed material of the same type as was used in the surrounding pavement. Repair material must be compacted to a standard comparable to that of the surrounding pavement within the ALLOWABLE WORKING TIME. The procedures for repairing test holes must be detailed in the PROJECT QUALITY PLAN.
- 5.1.1.3 For PLACEMENT TRIALS only, the reporting requirements set down in Table 4 must be determined and reported to the PRINCIPAL

Table 4 – Reporting Requirements for Placement Trials

Layer	Requirements
Unbound	<p><u>(i) Maximum Wet or Dry Density</u> A sample for a laboratory maximum dry or wet density test must be obtained at each sample location using Test Method TfNSW T111 or TfNSW T162.</p> <p><u>(ii) Insitu Density</u> The field (insitu) density test must be in accordance with either Test Methods TfNSW T119 or TfNSW T173. All tests must be conducted using only one of these test methods. Results obtained from more than one test method must not be combined for a statistical assessment. Where TfNSW T173 is used for the insitu density determination, the probe must be extended to a depth as close as practicable to the layer thickness.</p>
Unbound (continued)	<p>Irrespective of the test method used to determine the insitu density, the proportion and density of oversize material (i.e. retained on the 37.5 mm AS sieve) in the sample for the laboratory maximum dry density test must also be determined, in accordance with the procedure described in TfNSW T119.</p> <p><u>(iii) Field moisture</u> Field moisture content must be determined in accordance with Test Methods TfNSW T120, TfNSW T121 or TfNSW T180. TfNSW T121 and TfNSW T180 must only be used where results have previously been calibrated against those of TfNSW T120 for the range of materials being compacted.</p> <p><u>(iv) Relative Compaction</u> The relative compaction must be calculated in accordance with Test Method TfNSW T166. The following must be recorded and reported: .1 Test location. .2 Relative compaction result(s) for the pavement depth at each site.</p>
Bound or modified	<p><u>(i) Maximum Wet Density</u> The maximum wet density determined in accordance with Test Method TfNSW T162 must be determined on samples moulded where the maximum time after mixing of the stabilising agent does not exceed 3 hours. Providing the proportion of oversize material (ie retained on 37.5 mm sieve) is not more than 40%, the procedure as described in TfNSW T166 must be followed to calculate the maximum wet bulk density.</p> <p><u>(ii) Insitu Density Testing</u> The layer must be tested in accordance with Test Method TfNSW T173. Where the thickness exceeds 250 mm, wet densities must be determined over two equal depth intervals to assess the uniformity of compaction. Values of wet density must be recorded and reported.</p> <p><u>(iii) Relative Compaction</u> The relative compaction must be calculated in accordance with TfNSW T166. The following must be recorded and reported: .1 Test location; .2 Relative compaction result(s) for the pavement depth at each site.</p>

Layer	Requirements
	<p>(iv) <u>Unconfined Compressive Strength (UCS)</u> The samples are to be taken and prepared within 3 hours of the BINDER being incorporated as follows:</p> <ol style="list-style-type: none"> .1 The test specimens must be moulded from material that has been sampled from the pavement after final mixing and prior to compaction. The moisture content may be adjusted to below optimum moisture content for laboratory compaction of UCS samples. .2 Samples for testing must be taken from the same sampling location as for insitu density testing. The locations must be from different mixer runs and must not be from adjacent test sites. .3 The sample must be stored in a loose state, in sealed containers. .4 UCS testing must be in accordance with Test method TfNSW T131. One pair of UCS cylinders must be tested after 7 days curing at $65^{\circ} \pm 5^{\circ}$ C (accelerated curing). <p>The following must be recorded and reported in addition to the reporting requirements of TfNSW T131:</p> <ol style="list-style-type: none"> a Time of commencement of mixing of the lot. b Time of completion of mixing of the lot. c Time of sampling each sample. d Time of commencement of compaction of each UCS sample. e Location of each sample in the patch and the patch reference. <p>(v) <u>Binder application rate</u></p> <ol style="list-style-type: none"> .1 Actual application rate for each patch or each 100m of patch (insitu mixed). .2 Actual application rate per 200 tonnes of mix (plant mixed).
Asphalt	<p>The calculation of insitu air voids must be based on the bulk density of the core (AS 2891.9.2) and the mean maximum density of the lot of asphalt from which the heavy patch is supplied (AS 2891.7.3).</p> <p>The insitu air voids of each core must be separately reported to the PRINCIPAL together with the average insitu air voids and coefficient of variation in each layer.</p>

5.1.2 Principal May Direct New Placement Trials

In the event of nonconformity or when the PRINCIPAL deems that a previous PLACEMENT TRIAL no longer is representative due to changes in the equipment, materials, personnel, or rate of output, the PRINCIPAL may direct a new PLACEMENT TRIAL at YOUR cost. YOU must notify the PRINCIPAL of any changes in equipment, materials or construction procedures. The PRINCIPAL may also direct new PLACEMENT TRIALS if nonconformities are identified during random audit checks.

5.2 CONTINUING COMPLIANCE WITH APPROVED CONSTRUCTION PROCESSES

- | | | |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| 5.2.1 | Following the successful completion and acceptance of the PLACEMENT TRIALS, the scheduled works must be carried out using the same equipment and methods employed for the PLACEMENT TRIALS. | Use same equipment and methods |
| 5.2.2 | The PROJECT QUALITY PLAN must include a procedure for ensuring that the approved construction processes are followed and routinely verified and YOU must certify compliance when claiming payment. | Follow procedure |
| 5.2.3 | The PRINCIPAL will accept the work as conforming providing that the YOU have complied with the PROJECT QUALITY PLAN and the conformity criteria set out in Clause 5. | Acceptance of work based on compliance to PQP |

- 5.2.4 The PRINCIPAL may carry out random testing of the works at any time at the PRINCIPAL'S cost. Where a nonconformity is identified, the PRINCIPAL may request changes to the materials or construction procedures or direct new PLACEMENT TRIALS. **Random testing**

5.3 PAVEMENT DENSITY

5.3.1 Compaction Standard for Placement Trials

- 5.3.1.1 Each pavement layer of each PLACEMENT TRIAL must conform to the compaction standard specified in Table 5. The assessment procedures are in accordance with Clause 5.1 **Compaction standard**

Table 5 – Limits on insitu density of pavement layers

Material	Specification Limits	Hand	Minor	Major
Unbound, modified and bound (plant or insitu mixed) for base/subbase, SELECTED MATERIAL.	Average Relative Compaction (%) of Std. Comp.	≥98%	≥100%	≥100%
	No individual result less than	95%	97%	97%
Asphalt	Average insitu air voids	>4% <12%	>4% <10%	>4% <7%
	Individual min	2%	2%	2%
	Individual max	14%	12%	9%
Sand Cement Mix	Average Relative Compaction (%) of Std. Comp.		≥100%	≥100%
	No individual result less than		97%	97%

5.3.2 Acceptance Procedure for Compaction for All Works

- 5.3.2.1 After completion of the PLACEMENT TRIALS, YOU must detail in the PROJECT QUALITY PLAN a compaction procedure that achieves the insitu density requirements specified in Table 5 in all layers. **Detail compaction procedure in PQP**
- 5.3.2.2 The compaction procedure must address the following: **Items to be addressed**
- .1 Acceptable pavement and weather conditions.
 - .2 Equipment type, condition, numbers and operation.
 - .3 Operator training and experience.
 - .4 Rolling patterns, including joints.
 - .5 Layer thickness and rolling temperature limitations.
 - .6 Contingency in case of breakdown or change in ambient conditions.
- 5.3.2.3 Provided the above requirements are met, the PRINCIPAL will accept conformity on the basis of adherence to the procedure detailed in the PROJECT QUALITY PLAN. **Continuing adherence**

5.4 SURFACE FINISH AND SEGREGATION

Every heavy patch must contain only material that is essentially homogeneous. The finished surface of the pavement must be of uniform appearance, tightly bonded, and free of marks caused by workers and machinery. Prior to placing subsequent layers, ensure material in the previous layer is not segregated, cracked, or unsound.

**Finished surface
and sound layers****5.5 SURFACE SHAPE**

5.5.1 Unless otherwise specified, the finished surface of the heavy patch (as defined by PATCH CATEGORY) must not deviate from the bottom of a straightedge laid in any direction and at any point on the surface of the patch by more than the following tolerances:

Within patch

- .1 Hand and minor heavy patches (straightedge used in 1.5 m configuration): 5 mm.
- .2 Major heavy patches (straightedge used in 3 m configuration): 5 mm.

5.5.2 Where the adjacent pavement is not deformed, the difference in level between the surface of the heavy patch and the surface of the adjacent pavement must not exceed 5 mm when determined by measurement under a straightedge at any location on the joint.

**Relative to
adjacent pavement**

5.5.3 Ponding of water must not occur in or adjacent to the heavy patch as a result of the work.

No ponding**5.6 GENERAL TESTING REQUIREMENTS**

5.6.1 The PROJECT QUALITY PLAN must provide for carrying out the testing as set out in Tables 6 and 7, and YOU must ensure that it is carried out and documented for surveillance or audit purposes.

**Document testing
requirements in
PQP**

5.6.2 Attention is drawn to the requirements of TfNSW Q in respect of limits on lot size.

Lot size**Table 6 – Excavation and trimming**

Note: In column "When"; T = Trial only; B = Both trial and ongoing works

Clause	Characteristic	Test Method	Minimum Frequency of Testing	When
4.2 Table 8	Depth of Excavation	Refer to Clause 5.6	One per sampling location in accordance with Clause 5.7 on the excavated floor of each patch	B
4.2	Trimming of edges	Visual Inspection	Each heavy patch prior to placing patching materials	B

Table 7 – Pavement layer(s)

Note: In column “When”; T = Trial only; B = Both trial and ongoing works

Clause	Characteristic Analysed	Test Method	Minimum Frequency of Testing	When
3	Pavement material quality	In accordance with relevant materials specification		T
4.7.1.1 and 4.8.2	Air and surface temperatures	Contractor's Procedure	At commencement of each shift	B
4.8.5	Pavement Material Temperature	Refer Clause 4.8.5 for asphalt	One per each load delivered to site.	T
4.11.1.5	Surface temperature of new pavement (Asphalt)	Contractor's Procedure	Each heavy patch prior to opening to traffic.	B
5.3	Pavement Density	Refer to Table 5	Each placing trial at intervals specified in Table 1	T
5.4	Surface finish and Segregation	Visual Inspection	Each completed layer in each heavy patch	B
5.5	Surface Shape	Contractor's Procedure	Each Patch	B
5.7	Course Position	Refer to Clause 5.7	One per sampling location on each pavement course of the patch in accordance with Clause 4.6	T
4.7.3	Spreading of BINDER	Refer clause 4.7.3	Each patch or each 100m for patches exceeding 100m	B

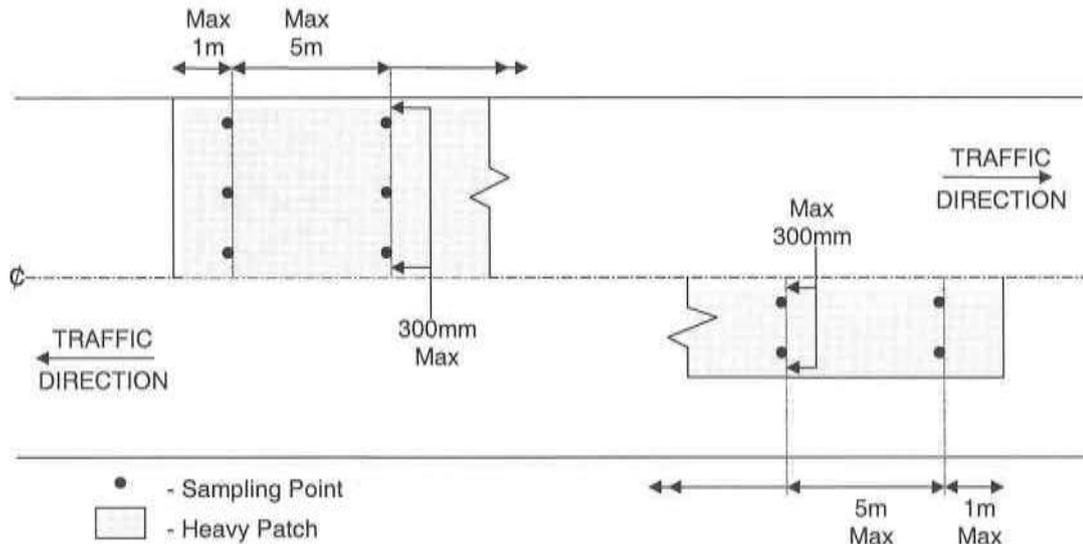
Table 8 – Water requirements

Item	Clause	Requirements	Test Method/ Procedure	Criteria	Minimum Testing Frequency
1. Water	3.1.6	Water delivered conforms:			
		Water quality	Inspection	Not discoloured, salty, brackish or oily	Daily
		Chloride ion content	T1004	≤ 600 ppm	1 per source
		Sulphate ion in content	T1014	≤ 400 ppm	
Undissolved solids content	AS 3550.4	≤ 1% by mass			

5.7 PAVEMENT COURSE POSITION

- 5.7.1 A pavement course may comprise more than one layer.
- 5.7.2 For heavy patching, pavement course position is defined as the distance in millimetres from finished surface level to the top of the pavement course. Finished surface level is defined as the equivalent of a taut stringline or straightedge spanning the heavy patch area and supported on each side by the existing adjacent pavement.
- 5.7.3 Pavement course position must be determined for each layer at locations as typically shown in Diagram 1. These locations must be agreed with the PRINCIPAL prior to commencement of work on the heavy patch.

- 5.7.4 Pavement course position must not vary from the specified requirement by more than the tolerances shown in Table 9.

Diagram 1 - Typical sampling locations for determination of course position**Table 9 – Limits of tolerance on pavement course depth**

Top of Pavement Course	Limits of Tolerance to be Applied to Specified Distance Below FSL (mm)	
	Excavation by Milling	Excavation by Other
Finished surface level (FSL)	The finished pavement surface must conform to the requirements of Clause 5.5 and must not pond water.	
>0 mm to ≤100 mm below FSL	-0 to +10	-0 to +40
>100 mm below FSL	-0 to +20	-0 to +70

- 5.7.5 The floor of the excavation position must be within the tolerances specified for top of pavement course at that position.
- 5.7.6 Prior to the placement of each pavement course, the position of the underlying surface must be determined.

5.8 FRICTION VALUE OF SURFACE COURSE AGGREGATE

When determined in accordance with AS 1141.41 and AS 1141.42, the Polished Aggregate Friction Value (PAFV) of surface course aggregate must not be less than the minimum value specified in Annexure A.1

5.9 WARRANTY PERIOD

YOU must warrant the work for the period set out in Annexure A.5. The PRINCIPAL will inspect the work at the end of that period. Any failure must be repaired in accordance with the requirements of this Specification at YOUR cost within a one month period.

Repairs

The Rework accomplishment must be recorded against Maintenance Activity 991 Rework Heavy Patching.

Accomplishment in warranty work

5.10 ACCOMPLISHMENT REPORTING

The accomplishment of conforming work must be reported as specified in Table 10.

Table 10 – Accomplishment reporting

Code	Description	Unit of Measure	Accomplishment Reporting
251	Prepare for heavy patch – remove/overlay existing sprayed seal ^A	m ²	Report area of existing sprayed seal surface treated.
252	Prepare for heavy patch – remove/overlay existing A/C wearing surface ^A	m ²	Report area of existing asphalt surface treated.
253	Heavy patching – Natural gravel layer ^B	m ³	Report volume of patch layer.
254	Heavy patching – Manufactured material layer ^B	m ³	Report volume of patch layer.
255	Heavy patching – Insitu-stabilised layer ^B	m ³	Report volume of patch layer.
256	Heavy patching – Bound material layer ^B	m ³	Report volume of patch layer.
257	Heavy patching – Asphalt layer ^B	m ³	Report volume of patch layer.
258	Prepare for heavy patch – remove/overlay existing concrete wearing surface ^A	m ²	Report area of existing concrete pavement treated.
991	Rework - Heavy patching	m ²	Report area of rework generated from Nonconformity.
Note	<ul style="list-style-type: none"> Items with postscripts “A” must be used in conjunction with any one of the items with postscript “B”. However each of these items is to be reported separately. If recording accomplishment against re-work do not report it against any other activity, because to do so will be doubling up.. 		

ANNEXURE M250/A – DETAILS OF WORK**A.1 MATERIAL REQUIREMENTS**

Pavement Material Specifications		
Material Ref.	Specification	Comments
Polishing Aggregate Friction Value (PAFV) requirements – see Clause 5.8		
Geotextile Requirements (* Refer to TfNSW R63)		
Application		Strength* Filtration Class*
Strengthening and separation layer on weak subgrade: non critical flow conditions		C1 Class 4
Trench drain, edge drain and drainage blanket		B1 Class 1

Contract Reference		Delivery Location			
Material Reference ⁽ⁱ⁾	Pavement Material Description	Road No	Road name & description	Distance (km)	Rate of Delivery (t/hr)
Special features required for delivery vehicles		Refer Clause 4.4.2.2			
Additional stockpile requirements		Refer Clause 4.4.3	Stockpile is covered to avoid entry of water or contamination(*)		
Material supply from		Refer Clause 4.4.4	CERTIFIED STOCKPILE / _____ (*)		
Notes:					
(i) The Material Reference must uniquely link the Nominated Mix Design with each pavement material specified in TfNSW M250.					
(*) Strikeout options that do not apply					

A.2 PAVEMENT DESIGNS

Design Ref	Layer 1 (Bottom)		Layer 2		Layer 3		Surface	
	Depth	Material Ref	Depth	Material Ref	Depth	Material Ref	Depth	Material Ref

Standard Resurfacing and Heavy Patch Designs	YES / NO
Resurfacing	
Type 1 Heavy Patch	
Type 2 Heavy Patch	
Type 3 Heavy Patch	
Type 4 Heavy Patch	
Type 5 Heavy Patch	

A.3 PLACEMENT TRIAL REQUIREMENTS

Patch Category	Design Reference	Placement Trials Required
		YES / NO
		YES / NO
		YES / NO

Note: All Patch Category / pavement design combinations will require Placement Trials unless stated otherwise.

A.4 LOCATION AND DETAILS OF WORK

Patch No.	Patch Category	Design Ref	Road No.	Segment	Chainage (l/r)	Size (m x m)	Area (m ²)	Sealing joints Clause 4.8.9
								Yes / No
								Yes / No
								Yes / No
								Yes / No
								Yes / No
								Yes / No
								Yes / No
								Yes / No
								Yes / No

A.5 WARRANTY PERIOD

Warranty Period:	("1 year" unless otherwise specified)
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A.6 MATERIAL DETAILS

1. MATERIAL REFERENCE ⁽ⁱ⁾:										
Stockpile Location	Location									
Refer Clause 4.4.3	Prepared by Contractor	Yes / No								(*)
2. PAVEMENT MATERIAL		Base / Subbase								(*)
Relevant tables	Refer to TfNSW 3051								(*)	
Material Designation	Refer to TfNSW 3051									(*)
Traffic Category (TC)	Refer to TfNSW 3051	A	B	C	D				(*)	
3. ADDITIONAL REQUIREMENTS										
Nominated Working Time	T147	≥ 8								hours
Modified material										
T131 Unconfined Compressive Strength		<1								MPa
Bound material										
T131 Unconfined Compressive Strength		>3								MPa
UCS Strength Gain		>1								MPa
Pretreatment required prior to testing using the following test methods:										
	T102	Refer to TfNSW 3051								
	T103	Refer to TfNSW 3051								
4. PRINCIPAL'S Nominated Mix Design (Refer Clause 2.3)										
Modified (*)	Bound (*)	Type & Source (Refer Clause 3)								
BINDER (*) / Chemical Additive (*) Proportions:										%
										%
										%
Additional requirements:										
Nominated Percentage of BINDER (*) / Chemical Additive (*)										% rate
Notes:										
(i)	The Material Reference must uniquely link the Nominated Mix Design with each pavement material specified in TfNSW M250.									
(*)	Strikeout options that do not apply									

A.7 INFORMATION FOR IDENTIFICATION CERTIFICATE

Information to be Included

- (a) Name of supplier and place of manufacture
- (b) Serial number of certificate (sequential & pre-numbered)
- (c) Date of supply
- (d) Name of customer, Project name and location
- (e) Mix identification (Nominated Mix Design)
- (f) Quantity of pavement material covered by certificate
- (g) TARGET MOISTURE CONTENT ENVELOPE
- (h) Time dispatched
- (i) Delivery vehicle identification (When delivered direct to site for use)
- (j) Batch identification (When delivered direct to site for use)
- (k) Unique identification code for the CERTIFIED STOCKPILE (When delivered from CERTIFIED STOCKPILE)

ANNEXURE M250/B – MEASUREMENT AND PAYMENT

B.1 GENERAL

- | | | |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| B.1.1 | Pay items are identified in Annexure B.2. | Pay Items to be used |
| B.1.2 | The price(s) of pay items with a quantity of work in the schedule must be costed with due allowance for all costs 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 |
| B.1.3 | Any overheads must be distributed between pay items. | Overheads |
| B.1.4 | Pay items with a quantity of work specified must not be tendered as a lump sum price. | No Lump Sum |
| B.1.5 | Payment must be made for any trial sections which form part of the work detailed in Annexure A and which conform to this Specification. | Trial procedures |
| B.1.6 | You are not paid for any rework required to achieve conformity. | No payment |

B.2 SCHEDULE OF PAY ITEMS

Pay Item *	Item Name and Description	What to claim and Units
SEALS	Payment includes supply and spraying binder and the supply and incorporation of aggregate. When provided on the WORK ORDER, a separate unit rate is to be given for each seal by aggregate size as shown below.	Area treated
M250P1	Primerseal	m²
M250P1.1	Primerseal 7 mm aggregate	m ²
M250P1.2	Primerseal 10 mm aggregate	m ²
M250P2	Final seal	m²
M250P2.1	Final seal 7 mm aggregate	m ²
M250P2.2	Final seal 10 mm aggregate	m ²
M250P2.3	Final seal 14 mm aggregate	m ²
M250P3	Surcharge modified BINDER Extra rate to be applied to M250P1, M250P1.n, M250P2 and M250P2.n for the use of modified BINDER in accordance with Specification TfNSW R107.	m²
PAVEMENT LAYERS	Payment includes costs associated with excavation of existing material, supply, haulage, placing, compaction and trimming of the pavement material, and the removal and legal disposal of excavated material. When provided on the work order, a separate unit rate is to be given for each of the quantity ranges shown	Volume of the compacted layer in m³
M250P4	Natural gravel pavement layer	m³
M250P4.1	Natural gravel up to 10 m ³ within WORK ZONE	m ³
M250P4.2	Natural gravel >= 10 m ³ to < 50 m ³ within WORK ZONE	m ³
M250P4.3	Natural gravel >= 50 m ³ to < 100 m ³ within WORK ZONE	m ³
M250P4.4	Natural gravel >= 100 m ³ within WORK ZONE	m ³
M250P5	Crushed rock pavement layer	m³
M250P5.1	Crushed rock up to 10 m ³ within WORK ZONE	m ³
M250P5.2	Crushed rock ≥ 10 m ³ to < 50 m ³ within WORK ZONE	m ³
M250P5.3	Crushed rock ≥ 50 m ³ to < 100 m ³ within WORK ZONE	m ³
M250P5.4	Crushed rock ≥ 100 m ³ within WORK ZONE	m ³
M250P6	Bound pavement layer	m³
M250P6.1	Bound pavement up to 10 m ³ within WORK ZONE	m ³
M250P6.2	Bound pavement ≥ 10 m ³ to < 50 m ³ within WORK ZONE	m ³
M250P6.3	Bound pavement ≥ 50 m ³ to < 100 m ³ within WORK ZONE	m ³
M250P6.4	Bound pavement ≥ 100 m ³ within WORK ZONE	m ³
M250P7	Sand cement pavement layer	m³
M250P7.1	Sand cement up to 5 m ³ within WORK ZONE	m ³
M250P7.2	Sand cement ≥ 5 m ³ to < 25 m ³ within WORK ZONE	m ³
M250P7.3	Sand cement ≥ 25 m ³ within WORK ZONE	m ³
M250P8	Insitu stabilised pavement layer	m³
M250P8.1	Stabilisation with in-place mixing up to 10 m ³ within WORK ZONE	m ³
M250P8.2	Stabilisation with in-place mixing ≥ 10 m ³ to < 50 m ³ within WORK ZONE	m ³
M250P8.3	Stabilisation with in-place mixing ≥ 50 m ³ to < 100 m ³ within WORK ZONE	m ³
M250P8.4	Stabilisation with in-place mixing ≥ 100 m ³ within WORK ZONE	m ³

Continues overleaf

Heavy Patching (Flexible Pavement)**M250**

Pay Item *	Item Name and Description	What to claim and Units
M250P9	Supply of stabilising agent Payment includes costs associated with supply of BINDER (stabilising agent). When provided on the WORK ORDER, a separate unit rate is to be given for each of the following types of BINDER:	Tonnes of binder applied on the pavement surface
M250P9.1	Supply of Quicklime	tonne
M250P9.2	Supply of Hydrated lime	tonne
M250P9.3	Supply of Slag/lime blend	tonne
M250P9.4	Supply of Cement	tonne
M250P9.5	Supply of Other BINDER	tonne
M250P9.6	Supply of Chemical Additive	tonne
M250P10	Surcharge - Stabilisation with mixing by stationary mixing plant When provided on the WORK ORDER, a separate unit rate is to be given for stabilisation with mixing by stationary mixing plant.	m³
M250 P11	Asphalt pavement layer Payment includes costs associated with excavation of existing material, supply, placing and compaction of asphaltic concrete. Includes the removal and legal disposal of excavated material. When provided on the WORK ORDER, a separate unit rate is to be given for each of the following quantity ranges based on the following asphalt reference densities: Dense grade asphalt – 2.400 t/m ³ Slag dense graded asphalt – 2.800 t/m ³ Open grade asphalt – 2.000 t/m ³ Stone mastic asphalt – 2.500 t/m ³	m³
M250P11.1	Asphalt up to 5 m ³ within WORK ZONE	m ³
M250P11.2	Asphalt ≥ 5 m ³ to < 20 m ³ within WORK ZONE	m ³
M250P11.3	Asphalt ≥ 20 m ³ to < 50 m ³ within WORK ZONE	m ³
M250P11.4	Asphalt ≥ 50 m ³ to < 100 m ³ within WORK ZONE	m ³
M250P11.5	Asphalt ≥ 100 m ³ within WORK ZONE	m ³
M250 P12	Asphalt surcharges When provided on the WORK ORDER, extra rates are to be applied to Maintenance Codes M25012.1 to M250P12.6 for the use of special mixes as specified below:	Volume of the compacted layer in m³
M250P12.1	Surcharge - SBS Binder Extra rate to be applied for incorporation of SBS binder in the asphaltic concrete.	m ³
M250P12.2	Surcharge - Multigrade Binder Extra rate to be applied for incorporation of multigrade binder in the asphaltic concrete.	m ³
M250P12.3	Surcharge - Heavy Duty Application Extra rate to be applied for use of heavy duty asphalt.	m ³
M250P12.4	Surcharge - High Friction Aggregate Extra rate to be applied for incorporation of high friction aggregate (PAFV of coarse aggregate ≥ 55) in the asphaltic concrete.	m ³
M250P12.5	Surcharge - Stone Mastic Asphalt Extra rate to be applied for use of stone mastic asphalt.	m ³
M250P12.6	Surcharge - Open Graded Asphalt Extra rate to be applied for use of open graded asphalt.	m ³

Continues overleaf

Pay Item *	Item Name and Description	What to claim and Units
DRAINAGE M250P13	Supply and install sub-surface drainage Payment includes costs associated with supply of all materials (including geotextile fabric, filter sand and sub-surface drain), excavation of trench and legal disposal of excavated material, laying of pipe and compaction of filter sand.	Length in place m
M250P14	Supply and install geotextile fabric Payment includes costs associated with supply and laying geotextile fabric within the excavation.	Area in place m²
M250P15	Establishment – Heavy Patching (Flexible Pavement) Note: It is taken that you have included all the following in tendering your establishment rate - no further payment will be made for them: <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); Principal's facilities (if required, • Initial travel to site or project; • Daily travel to/from site or project; • Accommodation (eg: on site or motel/hotel) . . 	Item Establishment is paid once per Work Order
<p>* Pay Items are primarily for guidance in preparing Work Orders (which can be Lump Sum or Schedule of Rates).</p> <p>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> <ol 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 Specification TfNSW G10 for a list of these.</p>		

ANNEXURE M250/C – SCHEDULE OF HOLD AND WITNESS POINTS AND IDENTIFIED RECORDS

C.1 SCHEDULE OF HOLD POINTS AND WITNESS POINTS

Clause	Type	Description
2.1.2	HOLD POINT	Commencement of work.
2.3.5	HOLD POINT	Use of proposed mix design.
2.4.5	HOLD POINT	Details of PLACEMENT TRIAL.
2.4.9	HOLD POINT	Continuation of heavy patching works after PLACEMENT TRIAL.
4.3.4	WITNESS POINT	Assessment of working platform.
4.4.2.6	HOLD POINT	Supply, or where specified, supply and delivery of, pavement material.
4.4.3.2	HOLD POINT	Construction of stockpile sites.
4.4.3.6	HOLD POINT	Delivery of material to a stockpile site constructed by YOU.
4.4.4.4	HOLD POINT	Supply of material from stockpile.
4.7.2.4	HOLD POINT	Use of alternative construction methods.

C.2 SCHEDULE OF IDENTIFIED RECORDS

Clause	Description of Identified Record
2.1	PROJECT QUALITY PLAN
4.7.3.1	BINDER spread rate monitoring data for insitu stabilised layers
5.1.1	Records relating to PLACEMENT TRIALS (as specified in clause)

ANNEXURE M250/D – PLANNING DOCUMENTS

D.1 SCHEDULE OF KEY QUALITY PLANNING ACTION POINTS

Key Points to be shown in the Inspection and Test Plan/Checklists and implemented, also additional requirements to be included in quality planning documents:

H = Hold Point Release

I = Inspection Point

J = Joint Survey Point

M = Measurement Point for payment

N = Notice to Principal

T = Test Point

R = Additional requirements to be shown in the PROJECT QUALITY PLAN

W = Witness Point

Clause	Description	Action Point
	General	

Clause	Description	Action Point
TfNSW Q	Definition of lot for each step of the process.	R
TfNSW Q	Procedures for management of each lot to completion of the Contract must be included in the PROJECT QUALITY PLAN.	R
TfNSW Q & M250 Clause 2.1	Details of verification and endorsement procedures must be included in the PROJECT QUALITY PLAN.	R

Clause	Description	Action Point
TfNSW Q	Storage and availability of conformance records.	R
TfNSW Q	Subcontractors quality plans assessed and audit procedure established.	R
TfNSW Q	Procedure for the identification and implementation of corrective action.	R
2.4.3	Location and details of PLACEMENT TRIAL(S) agreed by Principal.	H
2.4.9	Continuation of heavy patching works to proceed.	H
	Materials	
3	Minimum frequency of testing of product and constituents, release of HOLD POINTS, complying with relevant specification.	I, H
	Excavation and Trimming	
4.2	Verify depth of excavation and trimming of edges.	I, T
4.3.1 and 4.3.6	Assess and record condition of floor of excavation.	I
4.3.5	Notify Principal regarding unsuitable material.	I
	Pavement layers	
4.5.5, 4.7.1 and 4.8.2	Climatic constraints satisfied.	T
4.5	Material under base.	I
4.7.2.3	Alternative construction method submitted and approved.	H
4.7.4	Insitu mixing process documented.	R
4.8.5	Temperature of each delivered load measured and recorded.	T
4.7.6, 4.8.8 and 4.8.9	Joints constructed in accordance with specified procedure and crack sealed if specified in Annexure A.4.	R, I
3.3 and 3.4	Equipment in satisfactory condition.	I
4.6.5 and 4.7.7.4	All trimming is cut to waste.	I, R
4.7.7	Curing of layer fully implemented.	I, R
5.3.1	Compaction procedure demonstrated by PLACEMENT TRIAL and HOLD POINT released.	R, H
4.5.3, 4.6.2, 4.7.7 and 4.8.7	Project specific placing and compaction techniques implemented.	R
	Finished Work	
4.10	Procedure for protecting and reinstatement of services.	R
4.11	Procedure for opening to traffic fully implemented.	R, I

Clause	Description	Action Point
5	All conformity criteria verified.	I, T

D.2 SUPPLY METHOD FOR PAVEMENT MATERIAL

Process	Details
Work Health and Safety requirements	<ul style="list-style-type: none"> Materials safety data sheets and safe work method statements.
Extraction	<ul style="list-style-type: none"> Location of quarry or pit. Method of extraction.
Process	<ul style="list-style-type: none"> Crushing. Screening.
Stockpiling	<ul style="list-style-type: none"> Construction of stockpile site. Management of stockpile. Signposting. Maintenance of stockpile site including details of measures for: <ul style="list-style-type: none"> Prevent loss of fines, segregation and contamination at stockpile site. Erosion and sedimentation control. Clean-up or restoration of stockpile site.
Certification	<ul style="list-style-type: none"> Inspection and test plan.

D.3 PRODUCTION USING STATIONARY PLANT

Process	Details
Plant	<ul style="list-style-type: none"> Type of plant. Hopper capacity. Output capacity. Manufacturers' recommendations.
Mixing	<ul style="list-style-type: none"> Mixing time. Control of material content and moisture content (including methods to ensure uniformity). Maintaining mixing efficiency (e.g. replacement of worn mixing blades or tines). Calibration method(s) and frequency. Daily calculations to ensure compliance with the mix requirements. Calculation of percentage BINDER or chemical additive - refer to Annexure L.1 Inspection and test plan.
Materials handling	<ul style="list-style-type: none"> Charge/discharge of plant. Control of uniformity during loading, mixing, and discharge.

D.4 DELIVERY OF PAVEMENT MATERIAL

Process	Details
Vehicles	<ul style="list-style-type: none">• The number, type and capacity of transport vehicles.• Suitability for direct discharge into paver hopper where required.• Measures to prevent loss of material or moisture during transit.• Methods to be used to prevent segregation and/or loss of fines.• Measurement of quantity.
Materials handling	<ul style="list-style-type: none">• Control of uniformity during loading, transport and discharge.• Identification certificates.
Delivery to spreading equipment	<ul style="list-style-type: none">• The time between completion of mixing and discharge into the spreading equipment.• The proposed method of discharge into the spreading equipment.
In-situ testing (where required)	<ul style="list-style-type: none">• Inspection and test plan.

ANNEXURE M250/E – RESURFACING AND HEAVY PATCHING DESIGNS

AC 14	50 mm	Resurfacing	
AC 14	50 mm		
AC 14 or AC 20	50 to 60 mm		Type 1 Heavy Patch
AC 14	50 mm		
AC 20	100 mm		Type 2 Heavy Patch
AC 14	50 mm		
AC 20	75 mm	Type 3 Heavy Patch	
AC 20	75 mm		
AC 20	75 mm		
AC 14	50 mm	Type 4 Heavy Patch	
AC 20	75 mm		
AC 20	75 mm		
4% cement bound granular material or equivalent	200 mm		
4% cement bound granular material or equivalent	200 mm		
AC 14	50 mm	Type 5 Heavy Patch	
AC 20	75 mm		
AC 20	75 mm		
4% cement bound granular material or equivalent	200 mm		
4% cement bound granular material or equivalent or 8:1 Sand/Cement	200 mm		
4% cement bound granular material or equivalent	200 mm		

Notes:

1. AC 20 may be substituted with AC 14 to suit site or operational conditions.
2. The nominated thickness of a layer of asphalt must be within 3.0 to 5.0 times the nominal mix size.

ANNEXURE M250/F – DESIGN DETAILS**F.1 INFORMATION TO BE SUBMITTED FOR NOMINATED MATERIALS**

Item	Information
1. Project Information	Unique Material Reference. Pavement Type (Unbound, Modified Or Bound). Stockpile Site and unique identification.
2. Pavement Materials	Description (Product Type). Geological classification of parent rock. Average particle size distribution of the material expressed as percentages passing each of the relevant sieves. This is the nominated particle size distribution. Maximum Dry Density (t/m^3) as per T111 or T162 without the addition of any BINDER or chemical additive: Test results to verify that the material complies with the requirements in TfNSW 3051. For recycled building material: <ul style="list-style-type: none"> - Test results for a sample of the nominated recycled building material to verify that the foreign material content complies with TfNSW 3051.
3. Water	Source. Test results confirming the water complies with this Specification.
4. BINDER	Test results confirming BINDER conforms with TfNSW 3211.
5. PROJECT QUALITY PLAN	The Quality Procedure for the supply of the Nominated Material.

F.2 INFORMATION TO BE SUBMITTED FOR EACH MIX DESIGN

Item	Information
1. Project Information	Unique Material Reference. Pavement Type (Unbound, Modified Or Bound). Stockpile Site and unique identification.
2. PROJECT QUALITY PLAN	The additional Quality Procedure for the supply and delivery of the Nominated Mix Design.
3. Mix Design	Mass of constituent quantities per yielded cubic metre of Pavement Material Proportion of BINDER by dry mass to be added to Pavement Materials: <ul style="list-style-type: none"> - Nominated percentage of BINDER. - Target percentage of BINDER. Moisture condition on which mix design is based (i.e. oven dry, saturated surface dry or nominated moisture content). ALLOWABLE WORKING TIME. TARGET MOISTURE CONTENT ENVELOPE.
4. BINDERS	Type, brand and source of each constituent source (e.g. location of powerhouse, location of mill). Proportion of each constituent in a blended BINDER. Test results on the BINDER or each constituent in a blend to the relevant TfNSW specifications. Where an alternative BINDER is supplied, test results and a certificate of compliance.

Item	Information
5. Chemical additives	Proprietary source, type, name. Manufacturer's specification and recommendation for dosage. Manufacturer's compliance.

ANNEXURE M250/G TO L – (NOT USED)**ANNEXURE M250/M – REFERENCED DOCUMENTS AND DEFINITIONS****M.1 REFERENCED DOCUMENTS****M.1.1 TfNSW Specifications**

TfNSW G10	Traffic Management
TfNSW M211	Crack sealing (bituminous surfacing)
TfNSW R33	Trench Drains
TfNSW R37	Intra-Pavement Drains
TfNSW R38	Edge Drains
TfNSW R63	Geotextiles (Separation and Filtration)
TfNSW R106	Sprayed Bituminous Surfacing (With Cutback Bitumen)
TfNSW R107	Sprayed Bituminous Surfacing (With Polymer Modified Binder)
TfNSW R111	Sprayed Bituminous Surfacing (With Bitumen Emulsion)
TfNSW R116	Heavy Duty Dense Graded Asphalt
TfNSW R117	Light Duty Dense Graded Asphalt
TfNSW R119	Open Graded Asphalt
TfNSW R121	Stone Mastic Asphalt
TfNSW R131	Guideposts
TfNSW R142	Retroreflective Raised Pavement Markers
TfNSW R143	Signposting
TfNSW R145	Pavement Marking (Performance Based)
TfNSW Q	Quality Management System
TfNSW 3051	Granular Pavement Base and Subbase Materials
TfNSW TS101	Traffic Control Signals – New Installation and Reconstruction

M.1.2 TfNSW Test Methods

TfNSW T111	Dry density/moisture relations of road materials (standard compaction)
TfNSW T119	Determination of density of road materials insitu using the sand replacement method
TfNSW T120	Determination of moisture content of road materials (standard method)
TfNSW T121	Determination of moisture content of road materials (sand bath or hot plate method)
TfNSW T131	Determination of unconfined compressive strength of road materials stabilised or modified with proportions of cement, lime or other cementitious materials.
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	Determination of relative compaction
TfNSW T173	Determination of field wet density of pavement materials using a nuclear gauge in direct transmission mode
TfNSW T180	Determination of moisture content of road materials (microwave oven method)
TfNSW T1004	Quantitative Determination of Chloride Ion in Water
TfNSW T1014	Quantitative Determination of Sulfate Ion in Water

M.1.3 Australian Standards

AS 1141.41	Methods for sampling and testing aggregates - Polished aggregate friction value - Horizontal bed machine
AS 1141.42	Methods for sampling and testing aggregates - Pendulum friction test
AS/NZS 2891.7.3	Methods of sampling and testing asphalt - Determination of maximum density of asphalt - Methylated spirits displacement
AS/NZS 2891.9.2	Methods of sampling and testing asphalt - Determination of bulk density of compacted asphalt - Presaturation method
AS 3550.4	Waters - Determination of solids - Gravimetric method

M.2 ABBREVIATIONS AND DEFINED TERMS

ALLOWABLE WORKING TIME	The time measured from the commencement of the addition of a stabilising agent before all activities up to and including Primary Trimming must be completed.
BINDER	A collective term for hydraulic agents or additives, such as cement, fly ash, lime, ground granulated iron blast furnace slag, used singly or blended and which sets when mixed with a pavement material and water.
BOUND MATERIAL	Granular materials to which lime, cement, bitumen or similar additives are added to produce structural stiffness.
CERTIFIED STOCKPILE	A stockpile that has been previously tested and demonstrated to comply with this Specification.
MODIFIED MATERIAL	The improvement of the properties of a material within a layer by the addition of small quantities of an additive.
NOMINATED WORKING TIME	The amount of time measured from the commencement of the addition of a stabilising agent before the material becomes difficult to place, shape, compact and trim. The time is calculated by laboratory testing to Test Method TfNSWT147. For work under this specification the Nominated Working Time must be greater than 8 hours.

PATCH CATEGORY	Heavy patches are categorised according to the construction methods that are practical in each case. There are three defined categories as specified in Annexure A (Location and details of work), as follows: .1 Hand (typical shovels and rammers) .2 Minor (typically back-hoe and vibrating plate or light roller) .3 Major (typically grader, paver, milling machine, heavy roller)
PLACEMENT TRIAL	A trial which confirms the suitability of a construction process to produce a heavy patch that meets the specified conformance criteria.
SELECTED MATERIAL ZONE	The top part of the UPPER ZONE OF FORMATION in which material of a specified higher quality is required. The selected material zone incorporates the areas of unsuitable material as described in Clause 4.3.
SELECTED MATERIAL	Material of specified quality used in the SELECTED MATERIAL ZONE as specified in Table 3 and Annexure A.
STABILISATION	The treatment of a road pavement material to improve it or to correct a known deficiency and thus enhance its ability to perform its function in the pavement.
TARGET MOISTURE CONTENT ENVELOPE	Determined for each PAVEMENT LAYER as a range from a minimum to a maximum percentage of the optimum moisture content.
UPPER ZONE OF FORMATION	The upper zone of formation includes the SELECTED MATERIAL ZONE and is at the top of the formation.
WORK AREA	The specific area on a road or bridge or within the road reserve where the construction or maintenance work is being done. The work area includes the areas where trucks and machines engaged in the work assemble and manoeuvre.
WORK ZONE	A work zone comprises all WORK AREAS that are separated from adjacent WORK AREAS by no more than a 1 km float distance. The float distance is the distance that plant and equipment must traverse in order to move between adjacent WORK AREAS.
YOU or YOUR	Means the Contractor, including subcontractors, employees and agents of the Contractor.

LAST PAGE