Muswellbrook Shire Council

CONSTRUCTION SPECIFICATION

AUS-SPEC (Cot 09)

1113 Stabilisation

Version 01

Amendment Record for this Specification Part

This Specification is Council's edition of the AUS-SPEC generic specification part and includes Council's primary amendments.

Details are provided below outlining the clauses amended from the Council edition of this AUS-SPEC Specification Part. The clause numbering and context of each clause are preserved. New clauses are added towards the rear of the specification part as special requirements clauses. Project specific additional script is shown in the specification as italic font.

The amendment code indicated below is 'A' for additional script 'M' for modification to script and 'O' for omission of script. An additional code 'P' is included when the amendment is project specific.

Amendment Sequence No.	Key Topic addressed in amendment	Clause No.	Amendment Code	Author Initials	Amendment Date
0	No amendment has been made	all	Nil		14 June 2012

Contents

1113 STABILISATION

1 General

1.1 RESPONSIBILITIES

Objectives
General: Provide stabilisation of subgrade and pavement courses using the specified materials and processes.

Performance
Requirements: Provide the work in accordance with the specification, standards, quality requirements and approved work plan.

Design
Authority requirements: Conform to statutory requirements for Occupational Heath and Safety.

1.2 Cross references

General
Requirement: Conform to the following:

- *0152 Schedule of rates – supply projects.*
- *0161 (Construction) or 0167 Integrated management.*
- *0179 General requirements (Construction).*
- *1101 Control of traffic.*
- *1112 Earthworks (Roadways).*
- *1141 Flexible pavements.*
- *1351 Stormwater drainage (Construction).*

1.3 REFERENCED DOCUMENTS

The following documents are incorporated into this worksection by reference:

Standards

AS 1141	Methods for sampling and testing aggregates
AS 1141.11.1-2009	Particle size distribution – sieving method
AS 1289	Methods of testing soils for engineering purposes
AS 1289.4.2.1-1997	Soil chemical tests - Determination of the sulfate content of a natural soil and the sulfate content of the groundwater - Normal method
AS 1289.5.7.1-2006	Soil compaction and density tests - Compaction control test - Hilf density ratio and Hilf moisture variation (rapid method)
AS 1289.5.8.1-2007	Soil compaction and density tests - Determination of field density and field moisture content of a soil using a nuclear surface moisture-density gauge - Direct transmission mode
AS 1289.6.1.1-1998	Soil strength and consolidation tests - Determination of the California Bearing Ratio of a soil - Standard laboratory method for a remoulded specimen
AS 2350 Various	Methods of testing Portland and blended cements
AS/NZS 2350.4: 2006	Setting time of Portland and blended cements
AS 2350.9-2006	Determination of residue on the 45 µm sieve
AS 3582	Supplementary cementitious materials for use with portland and blended cement
AS 3582.1-1998	Fly ash
AS 3582.2-2001	Slag - Ground granulated iron blast-furnace
AS 3583	Methods of test for supplementary cementitious materials for use with portland cement
AS 3583.3-1991	Determination of loss on ignition

AS 3583.6-1995 Determination of relative water requirement and relative strength
AS 3583.12-1991 Determination of available alkali
AS 3583.13-1991 Determination of chloride ion content
AS 3583.14-1991 Determination of insoluble residue content
AS 3972-1997 Portland and blended cements

Other publications for information or incorporated.

Austroads

AGPT04D/06-2006 Guide to pavement technology Part 4D - Stabilised materials.

Glossary of Austroads terms 2008

NSW RTA Test Methods
T432 – 2001 Rate of slaking of quicklime

1.4 Standards

General
Standard: To AGPT04D.

1.5 Interpretations

Abbreviations
General: For the purposes of this worksection the abbreviations given below apply.
- NATA: National Association of Testing Authorities.

Definitions
General: For the purposes of this worksection the definitions given below apply.
- Field Working Period: Time period from addition of mixing water until completion of compaction.
- Joints: Interfaces between work episodes delayed by more than the Field Working Period.
- Stabilising agent: Quicklime, hydrated lime, slag/lime blend, cement.

1.6 Submissions

Acceptance criteria
General: All submissions will be subject to the approval of the Superintendent.

Approvals
- Proposed Workplan.
- Stabilisation mix.

Materials: Cement, Quicklime, Hydrated lime, Ground granulated blast furnace slag, Flyash, Blended stabiling agents, Water.

Calculations
- Application rate.
- Unconfined compressive strength.

Execution
- Trial stabilisation.

1.7 Inspection

Notice
General: Give notice so that the inspection may be made of the following:

Summary of HOLD POINTS

Clause/subclause	Requirement	Notice for inspection	Release by
Specified materials			
PRE-CONSTRUCTION PLANNING			
Materials proposed for use in the work	Submit NATA certificate of compliance	14 days prior to commencement of works	Superintendent
Field Working period			
- **Laboratory**	Nominate the specific field working period in annexure A	14 days prior to commencement of works	Superintendent

Clause/subclause	Requirement	Notice for inspection	Release by
MATERIALS			
Cement			
- **Storage**	Re-test cement stored in excess of 3 months	2 working days prior to usage	Superintendent
EXECUTION			
Stabilisation processes			
- **Proposed equipment and procedures**	Submit a Work Plan nominating proposed plant and work sequence	14 days prior to commencement	Superintendent
Application of stabilising agent			
- **In situ application**	Proposals for special processes of supply of stabilising agent into the mixing bowl	7 days prior to mixing	Superintendent
Mixing			
- **In situ mixing process**	Demonstration of equipment mixing efficiency in trial section	7 days prior to production stabilisation	Superintendent
Trimming and compaction			
- **Trimming**	Work methods to exclude laminations and slurrying	3 working days prior to production stabilisation	Superintendent
- **Survey control methods**	Use of trimmed material as fill or spoil	3 working days prior to disposition	Superintendent
Curing			
Method statement	Submit details of proposed curing method	As directed	Superintendent
Trial section of stabilised earthworks			
General	Submit a trial section of stabilised earthworks	5 working days prior to commencement of works	Superintendent
General	Any deficient sections will require to be investigated and may be directed to remove	Progressive	Superintendent

Summary of WITNESS POINTS – Off-site activities

Clause/subclause	Requirement	Notice for inspection
MATERIALS		
Cement	Proof of quality and source	Progressive
Quicklime	Proof of quality and source	Progressive
Hydrated lime	Proof of quality and source	Progressive
Ground granulated blast furnace slag	Proof of quality and source	Progressive
Flyash	Proof of quality and source	Progressive
Blended stabilising agent		
- **Standard**	Proof of quality and source	Progressive
- **Batch information**	Batch data for correlation with supplier's test results	Progressive
- **Handling and storage**	Comply with supplier's handling and storage requirements and arrange sampling of agent	Progressive

Summary of WITNESS POINTS – On-site activities

Clause/subclause	Requirement	Notice for inspection
EXECUTION		
Quality requirements		
- **Compaction**	Adjustment of Field Working Period for site conditions	Progressive
Application of stabilising agent		
- **Stationary mixing plant**	Monitoring application of stabilising agent at the plant	Progressive
- **Stationary mixing plant**	Removal of spilled stabilising agent	Immediately upon spillage event
- **Spreading out**	Actual spread to be recorded and checked	Progressive
- **Spreading out**	Record average spreading rate using load cells	Progressive
Mixing		
- **Stationary mixing plant**	Test unconfined compressive strength	Progressive
- **In situ mixing process**	Visual inspection to ensure uniform mixing and record	Progressive
- **In situ mixing process**	Additional passes of mixing equipment to improve uniformity	Progressive
Trimming and compaction		
- **Survey control methods**	Survey to confirm pavement layer thickness remains within tolerances after trimming	Progressive
- **Straight edge test**	Conform to surface tolerances prior to sealing or practical completion of work component	As directed by Superintendent
Dimensions		
- **Width**	Random measurement of stabilised layer width	As directed by Superintendent

2 PRE-CONSTRUCTION PLANNING

2.1 SPECIFIED MATERIALS

Materials proposed for use in the work

Certificates of compliance: Provide a certificate from a NATA registered laboratory showing the following:

- the stabilisation mix(s) submitted and the mix constituents comply with the mix specified in **Annexure A.**
- the stabilised material meets the requirements of *1141 Flexible pavements* if incorporated into the works as a pavement layer or
- *1112 Earthworks (Roadways)* or
- *1351 Stormwater drainage*

This is a **HOLD POINT.**

Inspection, sampling and testing

Quality checks: Regular inspection, sampling and testing of pavement and subgrade materials to be undertaken by the Contractor while stabilisation is in progress in accordance with this worksection.

2.2 WORKS GENERALLY

Provision for traffic

Protection: Provide for traffic in accordance with *1101 Control of traffic* while undertaking the work and take all necessary precautions to protect the work from damage until such time as the new work has developed sufficient strength to carry normal traffic without damage.

Delays: Take all necessary steps to avoid or minimise delays and inconvenience to road users during the course of the work. Where adequate detours or side tracks are included in the contract or are otherwise available, traffic to be temporarily diverted while the work is in progress.

Proposals for construction

Program: Plan program of works to address time and access constraints. Develop equipment selection and material sources to suit the sequence of operations. Address the interaction with the Superintendent on approvals and inspections. Generate the Work Plan for Submission.

2.3 FIELD WORKING PERIOD

Laboratory tests

Submit: Provide the nominated Field Working Period in **Annexure A** for the stabilising agent approved for the works. This is a **HOLD POINT**.

Method: The nominated Field Working Period to be based on laboratory tests determining the time from mixing until such time as the calculated Wet Density for modified compaction procedures decreases by more than 2% points.

Samples: This testing to be undertaken utilising AS 1289.5.7.1 and samples of the materials representative of those to be utilised in the works.

Type: The field working period may vary significantly with variations in the type of stabilising agent.

3 MATERIALS

3.1 GENERAL

Stabilisation types: The requirements for stabilisation of the types of pavement courses and subgrade zones or layers are shown in **Types of pavement courses, subgrade zones or layers and stabilising binder** Table. The pavement course or subgrade zone or layer for stabilisation is as specified in 1141 Flexible pavements.

Types of pavement courses, subgrade zones or layers and stabilising binder table

Pavement course or subgrade zone or layer	**Stabilising binder**
Pavement course	
Base and subbase	Cement Blended Stabilising Agent Hydrated Lime (pugmill) Quicklime (in situ)
Subgrade zone or layer	
Selected Material Zone	Cement Blended Stabilising Agent Quicklime (in situ) Hydrated Lime (pugmill)
Other Subgrade Layers	Cement Blended Stabilising Agent Quicklime (in situ) Hydrated Lime (pugmill)
Selected Backfill Zone	Cement Hydrated Lime (pugmill)

3.2 CEMENT

Standard

Type: GP or GB Portland and blended cement to AS 3972.

- Tested: To AS 2350 (Various).

Proof of quality: Provide documentary evidence of the quality and source of the cement upon request at any stage of the work. This is a **WITNESS POINT**.

Storage

Storage period: Prior to use re-test and submit test results for cement that has been stored for a period in excess of three months from the time of manufacture to ensure the cement still complies with AS 3972. This is a **HOLD POINT**.

Costs: Borne by the Contractor.

Transport: Transport cement in water tight packaging and protect from moisture until used. Do not use caked or lumpy cement.

3.3 QUICKLIME

Standard

Type:

- Available lime: To AS 3583.12.
- Temperature rise: To test method T432.
- Particle size: To AS 1141.11.1.

Quality: Provide NATA laboratory test results to confirm that the quicklime supplied conforms with that specified. This is a **WITNESS POINT**.

Properties

Calcium oxide: Quicklime to consist of essentially calcium oxide in a highly reactive form. At the point of spread the content of calcium oxide > 85 %.

Slaking rate: The active slaking time ≤ twenty minutes. The temperature rise on slaking > 40℃ in 6 minutes (determined from the average of four samples tested in accordance with Test Method T432).

Particle size: The particle size distribution of the quick lime to comply with the following requirements in Table 3.1.

Table 3.1 Particle size distribution of quicklime

AS Sieve	Per cent passing
13.2 mm	100
9.5 mm	96–100
4.75 mm	70–100
2.36 mm	0–90

3.4 HYDRATED LIME

Standard

Type:

- Available lime: To AS 3583.12.
- Fineness: To AS 2350.9.
- Particle size: To AS 3583.14.

Quality: Provide NATA laboratory test results to confirm that the quicklime supplied conforms with that specified. Details to include percentage of calcium hydroxide, fineness expressed by percentage by mass passing the 45 µm sieve and source. This is a **WITNESS POINT**.

Properties

Calcium hydroxide: Hydrated lime to consist essentially of calcium hydroxide > 80 %. Both when used as the sole stabilising agent or blended with other additives.

Form: The material to be in powder form and must be dry.

Residue on sieving (Particle Size): The residue on a 300 µm sieve < 2 %.

3.5 GROUND GRANULATED BLAST FURNACE SLAG

Standard

Type: To AS 3582.2.

- Fineness: To AS 2350.9.
- Relative strength: To AS 3583.6.

Quality: Provide NATA laboratory test results to confirm that the slag supplied conforms with that specified. Details to include fineness expressed by percentage by mass passing the 45 µm sieve, relative strength (28 days) and source. This is a **WITNESS POINT**.

Slag: Ground granulated blast furnace slag is known as 'slag'.

3.6 FLYASH

Standard

Type: To AS 3582.1.

- Fineness: To AS 2350.9.
- Loss on ignition: To AS 3583.3.

Quality: Provide NATA laboratory test results to confirm that the flyash supplied conforms with that specified. Details to include fineness expressed by percentage by mass passing the 45 µm sieve, loss on ignition and source. This is a **WITNESS POINT**.

3.7 BLENDED STABILISING AGENTS

Standard

Type:

- Fineness: To AS 2350.9.
- Setting time: To AS/NZS 2350.4.

Quality: Provide NATA laboratory test results to confirm that the blended agent supplied is in accordance with that specified. Details to include fineness expressed by percentage by mass passing the 45 µm sieve, setting time and source of each component. This is a **WITNESS POINT**.

Batch information

Requirements: A blended stabilising agent may be used.

Blending mass: The mass of components of the nominated blended stabilising agent are not to vary by more than ± 3 % from the blend percentages nominated in the mix design described in **Annexure A**.

Quality: Provide NATA laboratory test results to confirm that the blended stabilisation agent supplied conforms with that specified. Details to mill and batch information that is traceable to the suppliers source. This is a **WITNESS POINT**.

Handling and storage

Requirements: Comply with the supplier's handling and storage requirements. Also arrange for sampling of the agent as directed. This is a **WITNESS POINT**.

3.8 WATER

Standard

Chloride ion: To AS 3583.13.

Sulphate ion: To AS 1289.4.2.1.

Quality

Water to be free from harmful amounts of materials such as oils, salts, acids, alkalis and vegetable substances. Water accepted as potable and fit for human consumption will not require testing to confirm suitability.

Tolerances: Water not to contain more than:

- 600 parts per million of chloride ion.
- 400 parts per million of sulphate ion.
- 1 % by mass of undissolved solids.

4 Execution

4.1 STABILISATION PROCESSES

Proposed equipment and procedures

Work plan: Submit details of the proposed equipment (including the mixing plant) and stabilisation procedures to be used in the work. This submission will be known as the Work Plan and is to include the following:

- The sequence of operations.
- Widths of stabilisation passes.
- Provision for traffic if appropriate.
- Comply with Statutory requirements for OH&S.
- Testing methods and frequency.
- Comply with this worksection.
- Survey control methods.
- Curing methods.

This is a **HOLD POINT**.

4.2 QUALITY REQUIREMENTS

Compaction

Compaction within Field Working Period: Complete the compaction process within the nominated Field Working Period unless specific approval is provided by the Superintendent to an adjustment for site and seasonal conditions. This is a **WITNESS POINT**.

Weather conditions

Moisture Content: Do not proceed with the stabilisation of pavement materials during wet weather or if rain is imminent and likely to occur during any stage of the stabilisation process so as to significantly influence the resultant moisture content and uniformity of moisture content in the mix.

Wind: Do not proceed with spreading during windy conditions which may cause loss of stabilising agent or cause nuisance or danger to people or property.

4.3 APPLICATION OF STABILISING AGENT

Stationary mixing plant

Application rate: Monitor the application rate of stabilising agent at the pug mill or equivalent approved plant. Record for every 100 tonnes of production in kg/tonne. This is a **WITNESS POINT**.

Accuracy: The achieved accuracy of application rate ± 10 % of the rate nominated in **Annexure A**.

Spillage: Remove any spillage of the stabilising agent on site or at any loading location related to the site as soon as possible and within the same work shift of such spillage. This is a **WITNESS POINT**.

Excessive application: Prevent excessive application so as not to exceed the nominated rate by more than 10 %.

Cost: Cost of any excess stabilising agent to be borne by the contractor.

In situ application

Application process: The incorporation of stabilising agent is to follow a process where it is spread on the pavement in advance of the specialist mixing equipment.

Special processes: Any processes nominated by the contractor involving supply of stabilising agent within the mixing bowl of equipment must be approved. A demonstration of the process at the Contractor's expense may be requested. This is a **HOLD POINT**.

Spreading out

Mechanical spreader: Carry out spreading using the approved mechanical spreader nominated in the Work Plan.

Spread rate: Nominated in **Annexure A**.

Tolerances: The actual spread rate to be within ±10 % of the nominated rate. Verify this by testing the spread rate for each lot or 500 m^2 of pavement treated (whichever is less) in each application of binder. This is a **WITNESS POINT**.

Testing: Spread rate testing to be performed by weighing the contents of a suitable 4 sided tray placed on the pavement and between the wheels of the mechanical spreader. Calculate the rate of stabilising agent spread by dividing the mass collected (kg) by the area of the tray (m^2).

Average spread rate: Where spreading vehicles are fitted with load cells, ascertain the average spreading rate of the stabilising agent by dividing the mass of the stabilising agent spread per run by the area of the run.

Record: Submit data for each run, however such action will not cancel the Contractor's obligation to undertake the prescribed testing of spread rate. This is a **WITNESS POINT**.

Cost: Cost of any excess stabilising agent to be borne by the contractor.

Construction traffic: Traffic or equipment not involved in spreading or mixing of the stabilising agent not to pass over the spread material until it has been mixed into the layer to be stabilised.

4.4 MIXING

Stationary mixing plant

Type: Purpose build the stationary mixing plant for the process of mixing road making materials.

Maintain equipment: Maintain and calibrate all equipment so as to provide a uniformly mixed product without segregation of the aggregate material.

Water addition: Control and meter the inclusion of water into the mix.

stationary mixing equipment: Incorporate a delivery system for mix materials capable of producing a uniform mixture to design requirements.

Strength test: Confirm performance by monitoring the unconfined compressive strength of production, to conform with AS 1289.6.1.1. Test a pair of specimens for each 100 tonnes of production. This is a **WITNESS POINT**.

Costs: Testing costs to be borne by the Contractor.

In situ mixing process

Equipment: Mixing equipment and procedure to comply with the following:

- Purpose built for the process of in situ mixing of road making materials.
- Capable of mixing to the depth specified for the layer to be stabilised.
- Distribute the stabilising agent uniformly through the full depth and over the whole area of the layer to be stabilised.
- A minimum of 2 passes of the mixing equipment is required.
- As mixing blades or tynes wear, replace to maintain mixing efficiency consistent with that demonstrated during the trial section.
- Mixing equipment capable of supplying a calibrated amount of water to the mixing bowl in a such manner as to provide a uniformly moist mix to a target moisture content.

Approval: Demonstrate the mixing efficiency. This is a **HOLD POINT**.

Uniform mixture: The resultant mix must be uniform over the full depth so that there are no lenses, pockets, lumps or granules of stabilising agent present in the layer or adjacent to it.

Work plan: The procedure nominated in the Work Plan is to minimise disturbance of the distribution of stabilising agent spread in advance of the mixing process.

Inspections: Carry out visual inspections during mixing to ensure uniform mixing is being achieved in the layer. Record inspection results to conform with *0161 Quality (Construction) or 0167 Integrated management*, as applicable. This is a **WITNESS POINT**.

Additional mixing: The Superintendent may direct that additional passes by the mixing equipment be carried out to improve the visual uniformity of the mix and/or the moisture content. This is a **WITNESS POINT**.

Costs: Any costs for additional mixing to be borne by the contractor.

4.5 TRIMMING AND COMPACTION

Tolerances

Level tolerance: After mixing, trim and compact the layer to conform with *1141 Flexible pavements* to produce a tight dense surface parallel with the finished wearing surface so that the levels do not vary from the design levels beyond the tolerance for primary trimming specified in **Limits and Tolerances**.

Trimming

Secondary trimming: Subsequent secondary trimming may be undertaken on one or more occasions in preparation for primer seal and with the objective of meeting shape and level requirements. Secondary trimming to involve cutting to waste. Work methods that lead to the development of laminations in the pavement will not be allowed and surface slurrying will not be accepted. This is a **HOLD POINT**.

Survey control methods

General: Provide adequate survey control methods as stated in the Work Plan to ensure that the pavement layer thickness is not reduced during secondary trimming to an extent that it fails to comply with the requirement for layer thickness in accordance with the tolerance specified.

Layer thickness after trimming: When required by the Superintendent provide survey results to confirm that the pavement layer thickness remains within tolerance after secondary trimming. This survey will be at no cost to the Principal. This is a **WITNESS POINT**.

Trimmed material: All trimmed material having been cut to waste is to be used as fill or spoil as directed. The material will be owned by the Principal. This is a **HOLD POINT**.

Straight edge test

General: Conform to the following:

- Measurements with a 3 metre straight edge to be taken at a minimum of 10 randomly selected stations so as to represent each 200 metre lane length or part thereof.
- Deviation of the surface from the bottom of a 3 metre straight edge placed in any direction not to exceed 12 mm.
- This testing will be undertaken immediately prior to sealing or prior to agreed practical completion of any work component. This is a **WITNESS POINT**.

Compaction

General: Compact the stabilised layer over the entire area and depth so that the relative compaction determined by AS 1289.5.7.1 is not less than as detailed in *1141 Flexible pavements*, *1112 Earthworks (Roadways)* or *1351 Stormwater drainage (Construction),* as appropriate.

Test method: To provide true relative compaction assessments the lots will be sampled and tested within the nominated Field Working Period to conform with AS 1289.5.7.1.

Wet Density: The maximum wet density (modified compaction) will be determined by sampling immediately after the determination of field density and testing to be undertaken within 2 hours of sampling. A determination of maximum wet density (modified compaction) representing the full layer depth is required for each sampling location when calculation of relative compaction is undertaken.

In situ dry density: The field density may be determined by in situ sand replacement testing or by single probe Nuclear Density Meter in direct transmission mode to conform with AS 1289.5.8.1.

4.6 JOINTS

Joint type

General: Joints comprise interfaces between work episodes that are separated in time by more than the nominal Field Working Period for the nominated stabilisation mix design.

- A longitudinal joint is considered to be a joint generally parallel to the road centreline.
- A transverse joint occurs when a length of work is terminated and extended at a later time after a period which exceeds the nominated Field Working Period.

Cutting back

General: Conform to the following:

- All longitudinal and transverse joints to be formed by cutting back into the previously stabilised and fully compacted sections.
- A minimum longitudinal overlap of mixing runs to be 75 mm.
- Transverse joints to be overlapped by a minimum of 2 m.
- Remix the material disturbed during cutting back at full depth and incorporate into the new work.
- No longitudinal joints to be allowed within 0.5 m of the centreline of a typical wheelpath.

Finish: The level and shape of the joints to be within the limits specified in **Limits and Tolerances**.

4.7 DIMENSIONS

Levels and surface trim

Surface levels: Conform to the following:

- The surface level after primary trimming + 30 mm and + 10 mm of the levels shown on the drawings.
- The surface level after secondary trimming + 15 mm and - 15 mm of the levels shown on the drawings.

- The pavement surface after secondary trimming and immediately prior to sealing to be of a quality such that deviation under a 3 metre straight edge does not exceed 12 mm.
- Ensure the final surface level is within ± 15 mm of the design levels in the event only a single trim is carried out.

Layer thickness

Layer thickness: Conform to the following:

- The final thickness of the stabilised layer at any point tolerance of + 20 mm and - 10 mm of the nominated layer thickness.
- The average thickness of the layer in a lot is determined from measurements of six randomly selected locations over any 200 m length of a lot and not less than that required to meet the specified final thickness tolerances after trimming.
- The layer thickness is measured at the edges of the stabilising run before compaction commences and measured relative to the finished design level.

Width

General: Conform to the following:

- The minimum width measured at any point of the stabilised layer must not be less than the specified width as shown in the drawings by more than 50 mm.
- Average width of the layer determined from measurements at 3 sites selected at random by the Superintendent over any 200 m length of a lot and not less than the specified width. This is a **WITNESS POINT**.

4.8 CURING

Method statement

Requirement: Submit to the Superintendent details of the proposed method of curing as part of the Work Plan. This is a **HOLD POINT**.

Curing method

Water curing: Protect the stabilised work against rapid drying out by keeping it continuously wet or damp during the period prior to the provision of a subsequent layer or the application of a prime or primer-seal. Water curing to consist of frequent light uniform spraying that will not produce significant run off or flooding on sections of the area. Avoid slurrying of the surface or leaching of the stabilising agent.

Curing Period: Under this Worksection provision for curing up to the period indicated in **Annexure A** is the responsibility of the Contractor at cost to the Contractor.

4.9 TRIAL SECTION OF STABILISED EARTHWORKS

General

Submit: Prior to the commencement of works submit a trial section of Stabilised earthworks to demonstrate the methods proposed to conform with this worksection. This is a **HOLD POINT**.

Trial section: This section is constructed so that it may be incorporated in the finished work. The length approximately 100 m.

Materials and methods: Construct the trial stabilisation using the materials, equipment and methods for placing and finishing the same as would be used for the entire base works. Demonstrate the methods proposed to be used for the construction of joints.

Deficient trial section: In the event of deficiencies in the stabilisation the trial section may not be approved. The method, equipment, materials and personnel will require to be reviewed and an explanation submitted. A further length of stabilisation may be requested. This is a **HOLD POINT**.

Contractor costs: The cost of removal of rejected works and the cost of making good any damage caused by such removal is to be borne by the Contractor.

Removal: Remove the non conforming trial stabilised earthworks ensuring to prevent damage to the remaining stabilised earthworks and underlying materials.

Dispose: Dispose of the removed materials at an approved location.

Payment: Payment made for the stabilisation at the schedule rates for appropriate pay items, if it has been constructed without deficiencies and is incorporated into the work.

4.10 LIMITS AND TOLERANCES

Application
Summary: The limits and tolerances applicable to this worksection are summarised in **Summary of limits and tolerances table**.

Summary of limits and tolerances table

Activity	**Limits/Tolerances**				**Worksection Clause**
Quicklime					
- Available lime	> 85% Calcium Oxide content				**Quicklime**
- Slaking rate	Active Slaking time < twenty minutes, and temperature rise on slaking > 40°C in 6 minutes (for an average of four samples).				**Quicklime**
- Particle distribution	Fraction passing AS Sieve:				**Quicklime**
	100%	for	13.2 mm	Sieve	
	96-100%	for	9.5 mm	Sieve	
	70-100%	for	4.75 mm	Sieve	
	0-90%	for	2.36 mm	Sieve	
Hydrated lime					
- Available lime	> 80% Calcium Hydroxide				**Hydrated lime**
- Particle size	< 2% residue on a 300 µm Sieve				**Hydrated lime**
Blended stabilising agents	**Blend percentages to not vary by more than ± 3% from those nominated in Annexure A**				**Blended stabilising agents**
Water					
- Chloride ion content	< 600 PPM Chloride ion				**Water**
- Sulphate ion content	< 400 PPM Sulphate ion				**Water**
- Undissolved solids	< 1 percent by mass of undissolved solids				**Water**
Application of stabilising agent					
- Spread rate or incorporation rate for in situ plant.	Actual spread rate shall be within ± 10% of the nominated rate				**Application of stabilising agent**
Trimming and compaction					
- Surface level	After primary trimming be within + 30 mm and +10 mm of levels shown on drawings After secondary trimming be within ± 15 mm of levels shown on drawings Final surface level ± 15 mm of design levels				**Dimensions**
- Shape	Not to deviate more than 12 mm under a 3 m straight edge immediately prior to first sealing				**Dimensions**
- Layer thickness	Final thickness of layers not to vary more than + 20 mm and - 10 mm of required thickness				**Dimensions**
Width					
- Width of stabilised layer	At any point, the width to be not less than 50 mm short of the width shown on the drawings with an average width always greater than that shown on the drawings				**Dimensions**
Joints					
- Longitudinal joint overlap	> 75 mm overlap of mixing runs				**Joints**
- Transverse joint overlap	> 2 m overlap of transverse joints				**Joints**
- Longitudinal joints	Not within 0.5 m of the centreline of a typical wheelpath				**Joints**

5 MEASUREMENT AND PAYMENT

5.1 MEASUREMENT

General

Payments made to the Schedule of Rates: To *0152 Schedule of rates – projects*, this worksection, as shown on the drawings and Pay items **1113.1** to **1113.2** inclusive.

Lump Sum prices: Not acceptable.

Unpriced items: If any item, for which a quantity of work is listed in the Schedule of Rates, has not been priced by the Contractor, due allowance is made in the prices of other items for the cost of the activity which has not been priced.

Methodology

The following methodology will be applied for measurement and payment:

- No account to be taken of allowable tolerances or overlaps.
- Except that where stabilisation is provided by use of stationary plant the supply of the material including the stabilisation service and stabilising agent is measured and paid to conform with *1141 Flexible pavements* or *1112 Earthworks (Roadways)*, as appropriate, for supply of the material as a pre-mix product. Supply in these circumstances includes all testing.
- Supply, spread and compact subbase, or base material is measured and paid to conform with *1141 Flexible pavements*.
- Supply, spread and compact select material is measured and paid to conform with *1112 Earthworks (Roadways)*.
- Control of traffic is measured and paid to conform with *1101 Control of traffic*.

5.2 PAY ITEMS

Pay items	Unit of measurement	Schedule rate scope
1113.1 Supply and spread stabilising agent (in situ mixing only)	m^2 The area to be determined by the length and width of work as specified on the drawings or as directed by the Superintendent.	All costs associated with the supply, delivery and spreading of the stabilising agent including testing in accordance with this worksection.
1113.2 Mixing of stabilising agent	m^2 The area to be determined by the length and width of work as specified on the drawings or as directed by the Superintendent.	All costs associated with the mixing of the stabilising agent with the designated materials in situ and to the nominated depth in accordance with this worksection.

6 ANNEXURE A

6.1 STABILISATION MIX DESIGN

Type of stabilising agent ……

……

……

……

Nominal percentage of stabilising agent by mass	……	%
Spread rate of stabilising agent for contractual purposes	……	(kg/m^2)
Depth of compacted layer to be stabilised	……	(mm)
Nominated Field Working Period	……	(hrs)
Nominated target unconfined compressive strength (UCS) (7 day accelerated curing)	……	MPa
Nominated target CBR value (4 day soaked) for stabilised modified subgrade	……	%
Period for contractor's curing	……	(days)
Nominated granular material(s)	……	(type)

Source of nominated granular material ……..……..