Superseded

Specification (Measurement)

Transport and Main Roads Specifications
MRS115 Insitu Stabilised Subbases using Triple Blend

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Queensland
Government

Contents

1 Introduction

This Specification applies to the stabilisation of materials insitu by the addition of a triple blend stabilising agent (hydrated lime, cement and fly ash).

This Specification shall be read in conjunction with MRS01 *Introduction to Specifications*, MRS50 *Specific Quality System Requirements* and other Specifications as appropriate.

This Specification forms part of the Transport and Main Roads Specifications Manual.

2 Measurement of Works

2.1 Standard Work Items

In accordance with the provisions of Clause 2.1.3 of MRS01 *Introduction to Specifications*, the Standard Work Items covered by this Specification, are listed in Table 2.1.

Table 2.1 – Standard Work Items

Standard Item No.	Description	Unit of Measurement
Insitu Stabilised Subbases using Triple Blend		
45001P	Excavation and disposal of material not suitable for stabilisation, [*type of material*] (Provisional Quantity, if ordered)	m³
45005P	New material to replace material not suitable for stabilisation [*type of new material*] (Provisional Quantity, if ordered)	m³
45009	Preliminary pulverisation [*location*]	m²
45010P	Additional material for shape correction [*type of new material*] (Provisional Quantity)	m³
45014	Insitu stabilisation using triple blend [*description, location*]	m²
45015	Supply of stabilising agent [*description, location*]	tonne
45016	Water curing [*location*]	m²

2.2 Work Operations

Item 45001P   Excavation and disposal of material not suitable for stabilisation, [*type of material*] (Provisional Quantity, if ordered)

Work Operations incorporated in the above item include:

   a)   Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*

   b)   excavating, loading and hauling of material not suitable for stabilisation, and

   c)   disposal of material.

Item 45005P   New material to replace material not suitable for stabilisation [*type of new material*] (Provisional Quantity, if ordered)

Work Operations incorporated in the above items include:

   a)   Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*

   b)   supply and delivery of all materials

c) spreading the materials

d) compacting, shaping and trimming the materials to facilitate insitu stabilisation and work operations related to it

e) maintenance of the subgrade and/or pavement courses, and

f) associated material and construction compliance testing.

Item 45009   Preliminary pulverisation [*location*]

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*

b) pulverising the material to be stabilised,

c) compacting, shaping and trimming the material to facilitate insitu stabilisation, and work operations related to it, and

d) associated material and construction compliance testing.

Item 45010P   Additional material for shape correction [*type of new material*] (Provisional Quantity)

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*

b) supply and delivery of all materials

c) spreading the materials

d) compacting, shaping and trimming the materials to facilitate insitu stabilisation and work operations related to it

e) maintenance of the subgrade and/or pavement courses, and

f) associated material and construction compliance testing.

Item 45014   Insitu stabilisation using triple blend [*description, location*]

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*

b) compacting, shaping and trimming prior to spreading of the stabilising agent for each pass

c) uniform spreading of the stabilising agent for each pass

d) slaking of quicklime to complete hydration (if applicable)

e) incorporation of the stabilising agent into the material after each spreading pass

f) compacting, shaping and trimming of materials between each incorporation pass

g) supply, delivery, storage, application and incorporation of water

h) compaction

i) trimming

j) treatment at construction joints

    k)   disposal of excess and trimmed material

    l)   proof roll testing

    m)   maintenance of the stabilised layer, and

    n)   associated material and construction compliance testing.

Item 45015   Supply of stabilising agent [*description, location*]

Work Operations incorporated in the above item include:

    a)   Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*

    b)   supply, transport, delivery and storage of the stabilising agent, and

    c)   associated material and construction compliance testing.

Item 45016   Water curing [*location*]

Work Operations incorporated in the above item include:

    a)   Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*

    b)   supply, transport, delivery and storage of water

    c)   application of the water to maintain the stabilised layer in a damp condition at all times during the curing period, and

    d)   associated material and construction compliance testing.

2.3   Calculation of quantities

2.3.1   Stabilising agent

2.3.1.1   Triple blend with hydrated lime

Where hydrated lime is used, the mass of stabilising agent shall be calculated using the following formula:

$$M = A \times \left[S_{FA+GP} + \left(S_{HL} \times \frac{AL_x}{AL_y} \right) \right] \times \frac{1}{1000}$$

where:

M   = mass of stabilising agent (triple blend), in tonnes

A   = surface area of the pavement to be insitu stabilised, in m²

S_{FA+GP} = specified stabilising agent spread rate for the GP and fly ash proportion, in kg/m²

S_{HL} = specified stabilising agent spread rate for the hydrated lime proportion, in kg/m²

AL_X = available lime index for hydrated lime used in the laboratory mix design testing (%), and

AL_Y = available lime index for hydrated lime used in construction (%).

The mass of stabilising agent for each lot shall be calculated using the above formula.

The Available Lime Index shall be determined for the stabilising agent used in both laboratory design and construction. Except where stated otherwise in Clause 8 of Annexure MRTS115.1, an available lime index of 90% shall be assumed for laboratory mix design testing.

The quantity of stabilising agent shown in the schedules is based on an Available Lime Index of 90%. The Contractor shall make allowance for variations. Payment for the supply of stabilising agent shall be based on an Available Lime Index of 90%.

2.3.1.2 Triple blend with quicklime

Where quicklime is used, the mass of stabilising agent shall be calculated using the following formula:

$$M = A \times \left[S_{FA+GP} + \left(0.76 \times S_{HL} \times \frac{AL_x}{AL_y} \right) \right] \times \frac{1}{1000}$$

where:

M	=	mass of stabilising agent (triple blend), in tonnes
A	=	surface area of the pavement to be insitu stabilised, in m²
S_{FA+GP}	=	specified stabilising agent spread rate for the GP and fly ash proportion, in kg/m²
S_{HL}	=	specified stabilising agent spread rate for the hydrated lime proportion, in kg/m²
A_{LX}	=	available lime index for hydrated lime used in the laboratory mix design testing (%), and
A_{LY}	=	available lime index for quicklime used in construction (%).

The mass of stabilising agent for each lot shall be calculated using the above formula.

The Available Lime Index shall be determined for the stabilising agent used in both laboratory design and construction. Except where stated otherwise in Clause 8 of Annexure MRTS115.1, an available lime index of 90% shall be assumed for laboratory mix design testing.

The quantity of stabilising shown in the schedules is based on an Available Lime Index of 90%. The Contractor shall make allowance for variations. Payment for the supply of stabilising agent shall be based on an Available Lime Index of 90%.

2.3.2 Water curing

The area of water curing shall be calculated from the lengths and widths of the lots for which water curing has been specified.

2.3.3 Removal and disposal of material not suitable for stabilisation

The volume of material not suitable for stabilisation, shall be calculated from the loose truck volume of material disposed of from the Site. Before commencing this operation, the measured volume of the haulage plant and the loading method shall be deemed suitable by the Administrator. The total volume of material removed and disposed of, shall be agreed with the Administrator each day.

2.3.4 New material to replace material not suitable for stabilisation

The volume of replacement material shall be calculated by measuring the volume of the excavation. The volume of the excavation shall be determined from the three-dimensional shape boundary by the bottom of the excavation and the finished shapes and dimensions as shown on the drawings, or otherwise nominated in the Contract. A survey pick-up shall be used, or an alternative method deemed suitable by the Administrator.

3 Utilisation of a rejected lot for a reduced level of service

3.1 Maximum reductions in standards for a reduced level of service

A lot shall not be utilised for a reduced level of service if:

a) the actual value for any property or requirement not listed in the first column of Table 3.1, has failed to meet the specified limit or requirement for such property or requirement

b) the actual value for any property or requirement listed in the first column of Table 3.1, has deviated from the extended limit stated in the second column of Table 3.1

c) the actual value for any property given in Table 3.1, has deviated from the specified limit (not the extended limit) for the same property in the immediately preceding lot, or

d) the actual value for any property given in Table 3.1, has deviated from the specified limit (not the extended limit) for that property in more than three lots for any preceding work period.

Table 3.1 – Extended limits

Property	Extended Limit
Characteristic value of relative compaction.	Minimum characteristic value of relative compaction no less than the specified relative compaction minus 5%.
Stabilising agent content.	Minimum content no less than the ordered content (expressed as a percentage) minus 0.5%.
Characteristic value of the stabilised later thickness.	Minimum characteristic value of the stabilised layer thickness, no less than the design layer thickness minus 20 mm.

3.2 Determination of the reduced value

3.2.1 General

The reduced value shall be determined from the formula given below for the relevant property. Where there is more than one reduction, the percentage reduction for each property shall be added together to provide a total percentage reduction which shall be applied to the scheduled rate for all Work Items covered by Clause 2.2.

3.2.2 Compaction standard

Where a product standard applies to compaction, the percentage reduction shall be determined from the following formula:

$$\text{Percentage Reduction} = ((C_s - 3) - C_a)) \times 4$$

where:

C_s = the specified value of compaction, and

C_a = the actual minimum characteristic value of compaction.

When the actual minimum characteristic value of a lot's compaction results is less than 100%, but greater than 97% (standard compaction), the Contractor shall raise a suitable Nonconformance report. As per the above formula, a percentage reduction shall not apply for this lot.

When the actual minimum characteristic value of a lot's compaction results is less than 97%, but greater than 95% (standard compaction), the Contractor shall raise a suitable Nonconformance report. As per the above formula, a percentage reduction shall apply for this lot.

When the actual minimum characteristic value of a lot's compaction results is less than 95%, (standard compaction), the Contractor shall raise a suitable Nonconformance report. As per Table 3.1, the Administrator may reject this lot.

3.2.3 Stabilising agent content

The percentage reduction shall be determined from the following formula:

$$\text{Percentage Reduction} = (S - S_a) \times 10$$

where:

$S =$ the ordered stabilising agent content (expressed as a percentage) as defined in MRTS115, and

$S_a =$ the actual stabilising agent content (expressed as a percentage) determined in accordance with MRTS115.

3.2.4 Thickness of stabilised layer

If indicated in Clause 1 of Annexure MRS115.1, the percentage reduction shall be determined from the following formula:

$$\text{Percentage Reduction} = ((D_d - 5) - D_a) \times 2$$

where:

$D_d =$ the design layer thickness of the stabilised layer (mm), and

$D_a =$ the actual minimum characteristic value of the stabilised layer thickness measurements determined in accordance with MRTS115 (mm).

3.3 Application of the reduced value payments

The reduced values shall apply to the lot represented by the tests for the total thickness of the (individual) stabilised layer.

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