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Specification (Measurement)

Transport and Main Roads Specifications
MRS07B Insitu Stabilised Pavements using Cement or Cementitious Blends

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1 Introduction

This Specification applies to the stabilisation of materials insitu by the addition of a cementitious stabilising agent. This Specification does not apply to lime only stabilisation.

This Specification shall be read in conjunction with MRS01 *Introduction to Specifications* 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 Pavements using cement or cementitious blends		
4201P	Excavation and disposal of material not suitable for stabilisation, [*type of material*] (Provisional Quantity).	m³
4202P	Additional material for shape correction [*type of new material*] (Provisional Quantity).	m³
4203P	New material to replace material not suitable for stabilisation [*type of new material*], if ordered (Provisional Quantity).	m³
4210	Pulverisation prior to insitu stabilisation [*location*].	m²
4211	Insitu stabilisation using cement or cementitious blends [*description, location*].	m²
4221	Supply of stabilising agent [*description, location*].	tonne
4231	Water curing [*location*].	m²

2.2 Work Operations

Item 4201P   Excavation and disposal of material not suitable for stabilisation, [*type of 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)   excavating, loading and hauling of material not suitable for stabilisation, and

c)   disposal of material.

Item 4202P   Additional material for shape correction [*type of new material*] (Provisional Quantity).

Item 4203P   New material to replace material not suitable for stabilisation [*type of new material*], if ordered (Provisional Quantity).

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 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) material and construction compliance testing.

Item 4210 Pulverisation prior to insitu stabilisation using cement or cementitious blends [*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, and

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

Item 4211 Insitu stabilisation using cement or cementitious blends [*location*].

Work Operations incorporated in the above item include:

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

e) compaction and trimming prior to spreading of the stabilising agent for each pass, if required

f) uniform spreading of the stabilising agent for each pass

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

h) mixing, including incorporation of water

i) compaction

j) trimming

k) treatment at construction joints

l) disposal of excess and trimmed material

m) testing for visible deflection, and

n) associated material and construction compliance testing.

Item 4221 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 4231   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.

Items associated with the bituminous curing coat(s).

Work Operations incorporated in the above items include:

a) Work Operations listed in the relevant Specification(s)

b) supply, transport ,delivery and storage of the water for water curing, if required

c) water curing if the bituminous curing coat is not placed immediately after compaction, and

d) maintaining the relevant layers in a continuously moist condition as required until the bituminous curing coat is constructed.

2.3   Calculation of quantities

2.3.1   Stabilising agent

The mass of stabilising agent shall be calculated using the following formula:

$$M = \frac{A \times T \times D \times C_o}{100,000}$$

where:

M =   Mass of stabilising agent in tonnes

A =   Surface area of pavement to be insitu stabilised in m²

T =   Target Depth of stabilisation in mm

D =   Dry density of a representative sample of material to be stabilised (i.e. unstabilised material) that has been compacted to 100% of standard compaction, in tonnes per m³, and

C_o =   Ordered content of stabilising agent in percent (%).

The mass of stabilising agent for each lot shall be calculated using the above formula in conjunction with the dry density of the corresponding representative sample (compacted to 100% of standard compaction) for the lot.

The total mass of stabilising agent shall be the sum of the masses of stabilising agent calculated for each lot.

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 only has been specified.

No measurement for water curing shall be made for those lots for which curing via a bituminous curing coat has been specified.

2.3.3   Removal and disposal of material not suitable for stabilisation

The volume of material 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 as accepted by the Superintendent. The total volume of material removed and disposed of shall be agreed with the Superintendent each day.

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
Stabilising agent content	Minimum content no less than corrected content minus 0.5%
Characteristic value of Relative Dry Density (RDD)	Minimum characteristic value of RDD no less than Specified RDD minus 2%
Road roughness count rate	Maximum road roughness count rate of R_m as stated in Clause 1 of Annexure MRS07B.1 or, where R_m is not so stated, R_s + 20, where R_s is defined in MRTS07B

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:

Percentage Reduction = $(C_s – C_a)$ x 4

where:

C_a =   the actual characteristic value of compaction, and

C_s =   the specified value of compaction.

3.2.3 Surface evenness

The percentage reduction shall be determined from the following formula:

Percentage Reduction = $R_a - R_s$

where:

R_a =   the actual road roughness count rate, and

R_s =   the specified road roughness count rate as defined in MRTS07B.

3.2.4 Stabilising agent content

The percentage reduction shall be determined from the following formula:

Percentage Reduction = $(CO - S_a) \times 10$

where:

S_a =   the actual stabilising agent content as a percentage calculated in accordance with MRTS07B, and

CO =   the ordered stabilising agent content as a percentage as defined in MRTS07B.

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.

4 Additional payment for a higher standard of surface evenness

4.1 General

If indicated in Clause 2 of Annexure MRS07B.1, an additional payment above the scheduled rate, shall be made for the additional benefit of a higher standard of surface evenness on the surface of the final pavement layer as represented by the road roughness count rate. This shall be applied to the scheduled rate for all Work Items covered by Clause 2.2.

4.2 Payment

Any additional payment shall be determined from the formula:

Additional Payment = $R \times Q \times P$

where:

R =   scheduled rate for the Work Item for the top stabilised layer

Q =   compacted quantity in the lot (as modified by Clause 3.2), and

P = $\dfrac{0.4 \times (R_s - R_a - 5)}{100}$

        where:

        P =   the additional payment factor due to achieving a higher standard of surface evenness

        R_s =   specified road roughness count rate as defined in MRTS07B, and

R_a = 	measured road roughness count rate.

Notwithstanding the above the maximum value of P shall be 0.04.

### 4.3	Quantity of pavement to which the additional payment applies

The additional pavement shall apply to the lot represented by the higher standard of surface evenness for the total thickness of the (individual) stabilised layer.

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