Roads

Master Specification

RD-PV-S2 Plant Mixed Stabilised Pavement

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DEPARTMENT OF PLANNING, TRANSPORT AND INFRASTRUCTURE

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1	Initial issue (formerly R22 Construction of Plant Mixed Stabilised Pavement)	28/6/19	

Document Management

Contents

RD-PV-S2 Plant Mixed Stabilised Pavement

1 General

1.1 This Part specifies the requirements for the construction of Plant Mixed Stabilised Pavement, using stabilising binders such as lime, polymers, cement or fly ash, but excluding bituminous binders.

1.2 The pavement shall be placed in the configuration and binder content and any additional information regarding the mix design specified in Contract Documents "Pavement Work". Binder content is expressed as a percentage of the dry aggregate mass (i.e. excluding compaction water).

1.3 Documents referenced in this Part are listed below:

a) AS 1289 Methods of Testing Soils for Engineering Purposes.

b) AS 3972 Portland and Blended Cements.

2 Quality Requirements

2.1 The Contractor shall prepare and implement a Quality Plan that includes:

a) details of the type of mixing plant proposed, including type, proposed location, output capacity and method of controlling binder content and moisture content (including methods to ensure uniformity);

b) details of the retarder to be used with cement binder;

c) procedures for calibration of plant (including frequency);

d) procedure for verifying binder content, including evidence of reliability of the procedure;

e) procedures for material handling, including loading of mixer and control of segregation during loading and mixing; and

f) detailed procedures for pavement construction.

2.2 If not provided beforehand, the documentation shall be submitted at least 28 days prior to the commencement of site work.

2.3 Provision of the documentation listed in this Clause shall constitute a **Hold Point**.

3 Materials

3.1 Cement shall be in accordance with AS 3972 and shall be Type GB. A retarder shall be used with cement binders.

4 Mixing

Plant

4.1 The quarry material, Binder, retarder and water shall be mixed at a central mixing plant of the pugmill type. The mixing plant may be either a batch or continuous type. The mixing plant shall be fitted with a measuring device to allow accurate measurement of the amount of retarder being added to the mix. The mass of charge in a batch mixer or the rate of feed to a continuous type mixer shall not exceed that which will permit complete mixing of all material.

4.2 The mixing plant shall be operated in accordance with the manufacturer's recommendations. Mixing of material shall be continued until the quarry material, binder, retarder and water are evenly distributed through the mass and a uniform mixture of unchanging appearance is obtained.

4.3 Sufficient mixing capacity shall be provided to produce enough mixture to permit placing up to 200 t of mixture on the road bed per hour and capable of providing measurements of the binder

incorporated in the mix for each 200 t produced to within 0.3% of the dry mass of the material being stabilised.

Process Control Requirements

4.4 Production of each nominated mix shall be such that the minimum proportion of stabilising binder incorporated is within the specified tolerances. The Contractor shall implement a testing regime to demonstrate that the binder content complies with Clause 15 "Verification Requirements and Records".

4.5 At the end of each day's production, the average percentage of stabilising binder added to the plant mixed pavement material shall be calculated (as a percentage of the dry mass of the material being bound, to 0.05%) from the total amount of binder used that day (determined from delivery dockets, silo dippings, etc.) and the total quantity of material mixed and placed in the works that day (determined by appropriate measurement).

5 Transportation

5.1 During transportation to the site, the load shall be completely covered with a tarpaulin or similar heavy cover to protect the material against the effect of sun and rain. The cover shall not be removed until the load is about to be tipped

6 Delivery

6.1 The rate of delivery shall be sufficient to enable all spreading, shaping and compaction to be carried out within 2.75 hours of the material being stabilised. The rate of delivery and placing shall also be sufficient to enable the first (or initial) compaction testing to be undertaken within 1.5 hours of the material being stabilised. This is to enable additional rolling of the material if the compaction standard has not been achieved.

6.2 Stabilised material shall not be delivered when the shade air temperature exceeds 35ºC and material shall not be placed if the mix temperature at the site exceeds 27ºC.

7 Placing

7.1 The spreading and shaping of the stabilised materials shall be undertaken by either a paving machine or grader.

7.2 If a paving machine is used it shall be:

a) capable of laying and compacting pavement to a width of 12 m in a single pass;

b) equipped with sensing devices for level control capable of working from a pre-set string line;

c) fitted with a vibrating screed and tampers which impart an initial compactive effort to the pavement layer of up to 90% for the parent material; and

d) capable of placing up to 200 t/h of material.

7.3 The minimum subbase layer thickness shall be 100 mm. Where placed in 2 layers the upper layer of the stabilised course shall not be less than one half of the specified thickness of the stabilised course. Individual layers shall be of uniform thickness.

7.4 Each layer shall be fully compacted and the surface kept damp prior to placing the next layer. Where placed in 2 layers, the upper layer shall be placed as soon as practicable after the first layer and on the same day.

7.5 A lot shall not exceed one days' work.

8 Joints

8.1 The works shall be planned to minimise the number of joints. All joints, whether single or double layer, shall be near vertical and shall be continuous through the full depth of the stabilised material.

At the end of each days' work and where spreading operations have been halted for any reason for a period exceeding 3 hours, the Contractor shall provide construction joints at each discontinuity in the operation. Joints shall be cut within one hour of completion of compaction.

8.2 Joints shall be made either transverse or parallel to the direction of the stabilising run. The joints shall be formed by cutting back into the compacted stabilised material to the extent necessary to form a near vertical face. The loose trimmed material shall not be incorporated into the pavement. Joints shall be kept moist prior to commencement of the next stabilising run.

9 Curing

9.1 The surface of compacted stabilised layers shall be kept continuously moist by watering with suitable spraying equipment for a minimum period of 7 days.

9.2 For the purpose of this Clause and Clause 11 "Traffic Restrictions", the time period will commence at the completion of compaction of the section being stabilised.

10 Finish

10.1 The surface of the pavement layers shall be uniformly tight and free of loose uncompacted material, segregated or 'bony' material or soft, over wet areas and free of roller indentations. The surface of the subbase layer shall have a well graded aggregate texture.

11 Traffic Restrictions

11.1 No vehicular traffic or construction equipment (with the exception of vehicles and plant required for curing purposes provided vehicles utilised are only single axle units not exceeding 8 t per axle) will be permitted on stabilised areas for a period of 7 days from the completion of the compaction of the section being stabilised. After the 7 day period the only traffic permitted on stabilised areas shall be construction equipment used for construction of subsequent pavement layers and backfilling of kerb and gutter.

11.2 The Contractor shall not use any section of stabilised pavement as a construction / haul track.

11.3 Where heavy commercial vehicle access over the stabilised area is required, the Contractor shall place a 200 mm thick layer of PM2/20Q Class 2 Pavement Material over the area to be trafficked.

11.4 Equipment and vehicles required for kerb laying purposes will be permitted on stabilised areas after a period of 3 days from the completion of compaction of the stabilised section.

12 Sampling and Testing

Determination of Initial MDD

12.1 During production of the raw feed material, bulk samples shall be taken for the determination of the initial assigned value of maximum dry density in accordance with TP 166 and AS 1289.5.4.1.

Determination of Subsequent MDD Values

12.2 Additional bulk samples shall be taken from subsequent lots and the value of MDD updated in accordance with TP 166. The updated value shall be the assigned value for that lot. Traceability shall be applied to each lot and the assigned value of MDD for the lot shall be used when determining the Dry Density Ratio in accordance with TP 320.

12.3 Alternatively, conforming lots of raw feed may be combined on site to form a composite stockpile. For each day of production, 5 sample increments of raw feed shall be obtained at approximately equal intervals during the days' production. These increments shall be combined to form a bulk sample and an MDD determined which shall be used to update the assigned value. This MDD shall be used to determine the final compaction results for acceptance / verification.

12.4 For control testing during the placement of each layer, the assigned MDD for the material placed on the previous day shall be used.

Moisture Content Control

12.5 Samples shall be taken in conjunction with each binder content determination. If AS 1289.2.1.4 is utilised then calibration shall be conducted in accordance with AS 1289.B3.1 and calibration checks shall be carried out at the frequencies recommended in this Test Procedure.

Compaction

12.6 Unless otherwise stated in Contract Documents "Pavement Work" or on the Drawings, stabilised granular pavement layers shall be compacted uniformly to the full depth over the full width to not less than 96% and the minimum frequency of testing shall be as follows:

Table RD-PV-S2 12-1 Testing Frequency

Lot Area (Square Metre)	Number Of Tests Per Layer
< 300	2
301 – 600	3
601 – 900	4
901 – 1 200	5
1 201 – 1 500	6
>1 500	6 plus 1 test for each additional 300 m^2 lot area or part thereof.

12.7 The location of the test shall be on a stratified random basis in accordance with AS 1289.1.4.2. Acceptance shall be based on discrete results. Where a result fails, the stratum represented by that result shall be the subject of a Non-conformance Report.

Levels and Position

12.8 Tolerances on the specified lateral position of stabilised pavement materials shall be ± 50 mm. The finished level of stabilised pavement layers shall be in accordance with Contract Documents or the Drawings.

13 Test Procedures

13.1 The Contractor shall use the following test procedures (refer https://www.dpti.sa.gov.au/contractor_documents) to verify conformance with the Specification:

Table RD-PV-S2 13-1 Test Procedures

Test		Test Procedure
Site Selection by Stratified Random Technique		AS 1289.1.4.2
Sampling of Soil, Aggregates and Rocks		TP 226
Preparation of Samples		AS 1289.1
Field Density:	Nuclear Method	AS 1289.5.8.1
Moisture Content:	Oven Drying Method	AS 1289.2.1.1
	Microwave Method	AS 1289.2.1.4
Maximum Dry Density:	Modified Compaction	AS 1289.5.2.1
	Three Point Method	TP 164(1)
Dry Density Ratio		TP 320

(1) The three point method may be used to provide MDD value in stabilised material.

14 Hold Points

14.1 The following is a summary of Hold Points referenced in this Part:

Document Ref.	Hold Point	Response Time
2	Submission of Procedures (if not in Post Tender Submission) and Plant Details	7 working days

15 Verification Requirements and Records

Test Records

15.1 The Contractor shall undertake the testing specified in this Clause and supply written evidence of compliance with the lot package.

Table RD-PV-S2 15-1 Verification Requirements

Document Ref.	Subject	Property	Test Procedure	Test Frequency	Acceptance Limits
4.2	Mixed Material Properties	Binder Content	Refer Quality Plan	One test per 150 t or part thereof	Within ± 0.5% of that specified
		Moisture Content	AS 1289.2.1.1 or AS 1289.2.1.4.	One test per calibration curve	Report Only
12.4	Pavement Compaction	Dry Density Ratio	TP 320	Refer Clause 12.4	Not less than 96%
12.5	Surface of Pavement Course	Levels	As specified in PC-S12	As specified in PC-S12	Refer R20

Other Records

15.2 The Contractor shall supply the following records:

Table RD-PV-S2 15-2 Other Records

Document Ref.	Subject	Record to be provided
4.5	Process Control	Daily production records of binder consumed, material mixed and placed
4.5	Process Control	Daily calculation of average binder content