

CITY OF DURBAN

STANDARD ENGINEERING SPECIFICATION

PART "EB"

GRADED CRUSHED STONE BASE

CONTENTS OF PART EB : GRADED CRUSHED STONE BASE

<u>CLAUSE</u>	<u>HEADING</u>	<u>PAGE NO.</u>
EB.1	SCOPE	EB.1
EB.2	INTERPRETATIONS	EB.1
EB.2.1	Definitions	EB.1
EB.2.2	Supporting Specifications	EB.1
EB.3	MATERIALS	EB.1
EB.3.1	Graded Crushed Stone	EB.1
EB.3.2	Prime Coat	EB.2
EB.4	PLANT	EB.2
EB.5	CONSTRUCTION	EB.2
EB.5.1	Mixing and Compaction	EB.2
EB.5.2	Preparation of Surface to be Primed	EB.2
EB.5.3	Application of Primer	EB.3
EB.5.4	Use of Surface by Construction Traffic	EB.3
EB.6	TOLERANCES	EB.3
EB.6.1	Tolerances	EB.3
EB.6.2	Rectification	EB.3
EB.7	TESTING	EB.4
EB.8	MEASUREMENT AND PAYMENT	EB.4
EB.8.1	Graded Crushed Stone Base	EB.4
EB.8.2	Prime Coat	EB.4

PART EB : GRADED CRUSHED STONE BASE

EB.1 SCOPE

The work comprises the construction of a graded crushed stone layer and, where specified, the application of a prime coat in accordance with the requirements of these specifications and in conformity with the lines, grades and dimensions shown on the drawings or as ordered by the Engineer. The finished thickness of the layer shall be as shown on the drawings or as specified in these documents.

EB.2 INTERPRETATIONS

EB.2.1 Definitions

Definitions for this specification are included in Part AB : General Specifications.

EB.2.2 Supporting Specifications

The following standards are referred to in the specification:

- S.A.B.S. 308 of 1971 - Cutback bitumen
- S.A.B.S. 748 of 1978 - Road tar binders prepared from coke oven crudes
- S.A.B.S. 749 of 1978 - Road tar binders prepared from Lurgi - gasification crudes
- S.A.B.S. 1260 of 1979 - Inverted emulsion premier

all as published in General Notice 463 dated 9 July 1982.

EB.3 MATERIALS

EB.3.1 Graded Crushed Stone

The material shall be 37,5 mm graded, crushed stone and shall be free from shale, clay and other deleterious substances and uniformly graded from coarse to fine within the following limits:

Sieve size mm	37,5	26,5	19,0	13,2	4,75	2,00	1,18	0,425	0,075
% passing by mass	100	84-94	71-84	59-75	36-53	23-40	19-35	11-24	4-12

Other requirements to be met are as follows:

- Maximum liquid limit = 25%
- Minimum crushing value (10% FACT dry test) = 160 kN
- Minimum crushing value (10% FACT wet test) = 110 kN
- Minimum linear shrinkage = 3%
- Maximum flakiness index (testing on -26,5 mm + 19,00 mm and - 19,0 mm + 13,2mm sizes only) = 35
- Maximum plasticity index = 6

EB.3 **MATERIALS (CONT'D)**

EB.3.2 Prime Coat

The primer shall conform to one of the standards listed in clause EB.2.2.

EB.4 **PLANT**

The premier shall be applied either by means of an approved self-powered pressure distributor fitted with a thermometer, volume measuring device, tachometer and full-width spray bars giving a uniform fan spray at the required rate or, with the approval of the Engineer, by a hand sprayer. The Contractor shall, if required, produce a test certificate to prove that the rate and uniformity of the spray is satisfactory.

In general, the Contractor may use whatever compaction equipment he considers appropriate to construct the work to the required specification. In certain circumstances, however, restrictions will be placed on the type of equipment allowed and in such cases the limitations will be specified in Part AA : Project Specification.

EB.5 **CONSTRUCTION**

EB.5.1 Mixing and Compaction

Construction shall be carried out to the full layer width and thickness in one operation and in continuous lengths, generally of not less than 100 m, unless otherwise authorised by the Engineer.

Level control pegs shall be placed at intervals not exceeding 10 m on straights and 5 m on curves of radii less than 100 m.

The crushed stone shall be formed into a regular, thick flat windrow and sufficient water added to increase the moisture content to within 2% of optimum.

Using a grader, the loose material shall be mixed across the roadbed until the moisture is uniform throughout the aggregate, supplemented, if necessary, with additional applications of water.

The prepared material shall then be properly shaped, compacted to the design density in accordance with good rolling practice while retaining the correct shape characteristics and shall be finished to a smooth, uniform surface.

EB.5.2 Preparation of Surface to be Primed

Before the primer is applied, the surface shall be swept clean and free from all dust and fines to expose the crushed stone aggregate. No priming shall be commenced until the layer has been approved by the Engineer. After approval priming shall be commenced within a period of 24 hours.

The prime coat shall be applied only when the surface is slightly damp.

EB.5 **CONSTRUCTION (CONT'D)**

EB.5.3 Application of Primer

The primer shall be applied at the rate of 0,6 l/m^2 and at a temperature recommended by the supplier. It shall be applied over the full width in one pass unless the Engineer instructs otherwise. The primed section shall be closed to traffic until it has dried sufficiently to prevent disturbance under traffic.

EB.5.4 Use of Surface by Construction Traffic

The type of construction traffic allowed on the graded crushed stone layer shall be such that no damage is caused to the layer or subgrade.

EB.6 **TOLERANCES**

EB.6.1 Tolerances

After completion of the layer it shall be tested for thickness, smoothness and accuracy of levels to comply with the following requirements:

EB.6.1.1 Thickness

The average thickness of any section, as determined from a minimum of five test holes randomly spaced shall not be less than the thickness specified and the allowable tolerance at any one test hole shall be ± 20 mm.

EB.6.1.2 Smoothness

The surface of the layer shall be free from any irregularities, bumps or depressions exceeding ten (10) mm when measured with a 3 m long rolling straight edge run parallel and at right angles to the centre line of the road. The completed layer shall also be free from any corrugations or any other wave effects. No asphalt shall be laid until the layer has been tested in accordance with this clause and approved by the Engineer.

EB.6.1.3 Accuracy of Levels

The elevation tolerance will be as specified under Part "DA" : Earthworks : Bulk - clause DA.6(d).

EB.6.2 Rectification

The top 75 mm shall be scarified, reshaped with added material as necessary and recompact all to specification. The area rectified, unless otherwise approved by the Engineer, shall not be less than 30 x 2 m.

EB.7**TESTING**

- (a) Before the layer is commenced the Contractor shall submit samples of the graded crushed stone together with the results of tests indicating compliance with the requirements of clause EB.3.1.

With the approval of the Engineer, the material may be delivered to the site and the Contractor shall be responsible thereafter for ensuring continued compliance with the specification and the site control testing of the processed crushed stone layer.

- (b) The acceptance tests to be carried out by the Engineer shall be for density and moisture content on completion of rolling (nuclear testing method to be used) - 7 tests per section.

The compacted layer must satisfy the following:

$$\bar{x} \geq 96\% + 0,5S$$

where \bar{x} = arithmetic mean of densities

S = standard deviation.

EB.8**MEASUREMENT AND PAYMENT****EB.8.1****Graded Crushed Stone Base**

The completed graded crushed stone layer shall be measured in cubic metres (m³) compacted in place. The rate shall cover the supply, loading, transporting, dumping, spreading, and all processing of the layer.

EB.8.2**Prime Coat**

The prime coat shall be measured in square metres (m²) and the rate shall cover sweeping, supplying and spraying of primer and protection of the primed area for at least 72 hours and protective measures to adjacent kerbing and paving.