

A proper record shall be kept to ensure that the daily turn out of work is correlated with the quantity of bitumen used as per proforma prescribed in Appendix 'A' .

16.34.2 Preparation of surface and application of binder (tack coat) shall be as specified under 16.28.2 to 16.30.5.

16.34.3 Preparation of Mix, laying and Consolidation

Para 16.30.4 and 16.30.5 shall generally apply except that the mixing shall be done in two stages. Stone aggregate of the correct standard size and in the proportion shown in table 16.29 shall be fed into the mixer to which 2/3 rd of the total specified quantity of bitumen heated to the appropriate temperature shall be added. When the stone metal is well coated, the sand in the specified proportion and then the balance 1/3rd quantity of total bitumen shall be fed into the mixer. Mixing shall be continued until a homogeneous mix is produced and all particles are uniformly coated with bitumen.

Any high spots or depressions which become apparent shall be corrected by addition or removal of premixed materials. The rolling shall continue until the maximum consolidation to the satisfaction of Engineer-in-Charge is obtained. The wheels of the roller shall be moistened with gunny bags to prevent the mixture from sticking to the wheel while rolling.

16.34.4 Surface finishing and rectification shall be as specified under 16.30.6 and 16.30.7.

16.34.5 Permitting Traffic

Traffic shall be allowed on the road after a lapse of 24 hours to 48 hours after laying, as decided by the Engineer-in-Charge.

16.34.6 Measurements

The length and width of the finished work shall be measured correct to a cm along the finished surface of the road. The area shall be calculated in square metre, correct to two places of decimal.

For record purposes measurements for binder, stone aggregate, stone chippings and sand as described under 16.3 shall be taken before they are actually used on the work. Premeasurements shall simply serve as a guide and shall not form the basis for payment. The thickness of surface treatment shall be the ruling criterion for payment.

16.34.7 Rate

The rate shall include the cost of materials and labour involved in all the operations described above.

16.35 SEAL COAT

16.35.1 Scope

This work shall consist of the application of a seal coat for sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall (camber).

16.35.2 Seal coat shall be of either of the two types specified below:

- (A) Liquid seal coat comprising of an application of all layer of bituminous binder followed by a cover of stone chips.
- (B) Premixed seal coat comprising of a thin application of the aggregate premixed with bituminous binder.

16.35.3 Materials

16.35.3.1 Binder : The binder and its quantity shall be a penetration bitumen of a suitable grade as specified in the item or as directed by the Engineer-in-charge.

16.35.3.2 Stone Chips for Item 16.41 of D.S.R. 2007 of Seal Coat : The stone chips shall consist of angular fragments of clean, hard, tough and durable rock of uniform quality throughout. They should be free of soft or disintegrated stone, organic or other deleterious matter. Stone chips shall be of 6.7 mm size defined as 100 per cent passing through 11.2 mm sieve and retained on 2.36 mm sieve. The quantity used for spreading shall be 0.09 cubic metre per 100 square metre area. The stone chips shall satisfy the quality requirements in Table 16.31 bituminous except that the upper limit for water absorption value shall be 1 per cent.

TABLE 16.30

Sl. No.	I.S. Sieve (mm)	Cummulative % passing by weight of total aggregate
1.	0.6	100
2.	0.3	95-100
3.	0.075	85-100

TABLE 16.31

Sl. No.	Name of Test	I.S. Code	Acceptance Criteria
1.	Grain size analysis	IS 2386 Part I	Max 5% passing IS sieve 75 micron
2.	Flakiness and elongation Index	IS 2386 (Part IV)	Max 30%
3.	Los Angeles Abration Value	IS 2386 (Part IV)	Max 30%
4.	Polished stone value	B.S. 812 (part 114)	Min 55%
5.	Soundness (a) Sodium sulphate (b) Magnesium sulphate	IS 2386 (Part V)	Max 12% Max 18%
6.	Water absorption	IS 2386 (Part III)	Max 2%
7.	Coating and stripping of Bitumen aggregate mixture	IS 6241	Min retained coating 95%
8.	Water sensitivity retained tensile strength	AASHTOT 283	Min 80%

* The elongation test to be done only on non-flaky aggregate on the sample.

** This test is only required if the minimum retained coating in the stripping test is less than 95%.

16.35.3.3 Fine Aggregate : The aggregate shall be sand or grit and shall consist of clean, hard durable, uncoated dry particles and shall be free from dust, soft or flaky/elongated material, organic matter or other deleterious substances. The aggregate shall pass 2.36 mm sieve and be retained on 180 micron sieve. The quantity used for premixing shall be 0.06 cubic metres per 100 square metres area. Stones or fine aggregate shall be used as specified in item.

16.35.4 Construction Operations

16.35.4.1 Weather and Seasonal Limitations : Ref. Item No. 16.32.2.1.

16.35.4.2 Preparation of Surface : The seal coat shall be applied immediately after laying the bituminous course which is required to be sealed. Before application of seal coat materials, the surface shall be cleaned free of any dust or other extraneous matter.

16.35.4.3 Construction of Seal Coat with Stone Chips : Bitumen shall be heated to 150°C - 163°C and sprayed at the rate specified on the dry surface in a uniform manner with a self-propelled mechanical sprayer

Immediately after the application of binder, stone chips which shall be clean and dry, shall be spread uniformly at the rate specified on the surface preferably by means of a self-propelled or towed mechanical grit spreader so as to cover the surface completely. If necessary, the surface shall be brushed to ensure uniform spread of chips.

Immediately after the application of the cover material, the entire surface shall be rolled with a 8-10 tonne smooth wheeled steel roller, 8-10 tonne static weight vibratory roller, or other equipment approved by the Engineer after laying trials if required. Rolling shall commence at the edges and progress towards the centre except in superelevated and unidirectional cambered portions where it shall proceed from the lower edge to the higher edge. Each pass of the roller shall uniformly overlap not less than one-third of the track made in the proceeding pass. While rolling is in progress, additional chips shall be spread by hand in necessary quantities required to make up irregularities. Rolling shall continue until all aggregate particles are firmly embedded in the binder and present a uniform closed surface.

16.35.4.4 Construction of Seal Coat with Premixed Fine Aggregate : A mixer of appropriate capacity and type approved by the Engineer-in-charge shall be used for preparation of the mixed material. The plan shall have separate dryer arrangements for heating aggregate.

The binder shall be heated in boilers of suitable design, approved by the Engineer-in-Charge to the temperature appropriate to the grade of bitumen or as directed by the Engineer-in-Charge. The aggregates shall be dry and suitably heated to a temperature between 150°C and 165°C or as directed by the Engineer-in-charge before these components are placed in the mixer. Mixing of binder with aggregates to the specified proportions shall be continued until the latter are thoroughly coated with the former.

The mix shall be immediately transported from the mixing plant to the point of use and spread uniformly on the bituminous surface to be sealed.

As soon as a sufficient length has been covered with the premixed material, the surface shall be rolled with an 8-10 tonne smooth-wheeled roller. Rolling shall be continued until the premixed material completely seals the voids in the bituminous course and a smooth uniform surface is obtained.

16.35.5 Opening to Traffic

In the case of seal coat with premixed fine aggregate traffic may be allowed soon after final rolling when the premixed material has cooled down to the surrounding temperature. In the case of seal coat with stone chips traffic shall not be permitted to run on any newly sealed area until the following day. In special circumstances, however, the Engineer-in-charge may open the road to traffic immediately after rolling, but in such case traffic speed shall be rigorously limited to 16 km. per hour until the following day

16.35.6 Measurement for Payment

Seal coat, for both items shall be measured as finished work over the area specified to be covered, in square metres at the thickness specified in the item.

16.35.7 Rate

The rate for seal coat shall be cost of all materials, labour and equipment involved in operation described above.

16.36 CEMENT CONCRETE PAVEMENT (UNDER ORDINARY CONDITIONS)

Specifications of item 16.37 to be followed except that cement concrete of grade 1:2:4 or specified otherwise to be prepared and compacted.