

Item No,1:- Providing and laying 20mm thick average for patch work Mix seal surface using stone chips @ 66% by weight, gradation as per MORTH specification and using bitumin VG-30 grade for tack coat 2.50Kg/10Sqm and for mixing rate not less than 50.90Kg/MT on BT surface using stone chips as per MORTH specification including heating the asphalt and aggregate by hot mix plant and spreading the same by paver finisher including consolidation with vibratory roller and providing, operating plant machineries, equipments, tools, plants, oil, fire wood, kerosene and all labour charges etc. complete.

SCOPE :-

This work shall consist of laying and compacting mix seal surfacing in a single course composed of suitable aggregates premixed with a bituminous binder on a previously prepared base in accordance with the requirements of these specification to serve as wearing course.

Materials

Binder

The binder shall be bitumen of VG-30 grade as directed by the Engineer-in-charge and satisfying the requirement of IS 73,217,454 or other approved cut bask.

Coarse aggregate.

The aggregates shall consist of crushed stone of Black trap Only They shall be clean strong, durable, of fairly cubical shape and free from disintegrated pieces, organic or other deleterious matter and adherent coating. The aggregates are to be used the bitumen shall preferably be treated with anti-stripping agents of approved quality in suitable dose as per Appendix-5. The aggregates shall satisfy the physical requirements set forth in table 500-3

| No | Test | Test Method | Requirements |
|----|-----------------------------------------------------------------------------------|----------------------|---------------------------------------|
| 1. | * Los Angeles Abrasion Value | IS : 2386 (PART – 4) | 40 Per Cent (Max) |
| 2. | Aggregate Impact Value | IS : 2386 (PART-4) | 30 per cent (Max) |
| 3. | Flakiness and Elongation Indices (Total) | IS 2386 (Part – I) | 30 Per cent Maximum |
| 4. | Coating and Stripping of Bitumen Aggregates Mixture | AASHTOT 182 | Minimum retained coating 95 per cent. |
| 5. | Soundness (i) Loss with sodium Sulphate 5 cycle (ii) Loss with magnesium sulphate | IS 2386-(Part5) | 12 per cent Maximum |
| | | | 18 per cent Maximum |
| 6. | Water absorption | IS : 2386(Part 3) | 2 per cent Maximum |

- * Aggregate ,may satisfy requirement of either of the two tests.
- ** To determine this combined proportion, the flaky stone from representative sample should first be separated out Flakiness index is weight of flaky stone metal divided by weight of stones sample Only the elongated particles be separated out from the remaining (non flaky) stone metal Elongation index is weight of elongated particles divided by total Non flaky particles. The value of flakiness index and elongation index so found are added up.

Fine aggregate

The fine aggregate shall consist of crusher run screenings, natural sand or a mixture of both these shall be clean, hard durable, uncoated, dry and free from injurious, soft or flaky pieces and organic or deleterious substances.

Aggregate Gradation

The coarse and fine aggregate shall be so graded or combined as to confirm to the grading set forth in table 500-10

Aggregate Gradation for Mix Seal Surfacing

| Sieve Designation | Per cent by weight passing the IS Sieve |
|----------------------------|-----------------------------------------|
| 13.2 mm | -- |
| 11.20 mm | 100 |
| 5.60 mm | 52-88 |
| 2.80 mm | 14-38 |
| 90 Micron | 0-5 |
| Proportioning of Materials | |

The total quantity of the aggregate used for mix seal surfacing shall be 0.27 Cum per 10 Sqm area. The quantity of binder used for premixing in terms of straight run bitumen shall be 5.09% by weight of the total mix i.e. 50.90 Kgs per tonne of mix

Before starting the work the contractor shall get the job mix formula for the mix approved by the Engineer-in-charge.

Construction operations

Weather and seasonal limitation

Mix seal surfacing shall not be laid during rainy season or when the base course is damp or wet.

Preparation of base

The base on which mix seal surfacing is to be laid shall be prepared shaped and conditioned of the specified lines, grade and cross sections in accordance with M.O.S.T. specification clause – 601 as directed by the Engineer-in-charge the surface shall be thoroughly swept and scrubbed. clean and free of dust and foreign matter.

Preparation and transportation of Mix :

Mix seal surfacing mix shall be prepared in a drum mix plant of adequate capacity and capable to yield a mix of proper and uniform quality with thoroughly coated aggregate. The plant shall be drum mix type, the plant shall have coordinated set of essential units capable of producing uniform mix within the job mix formula such as laid down in appendix – A

- (a) In case of drum mix plant, the cold feed system shall have variable speed belt conveyors/or other suitable devices for regulating the accurate proportioning of aggregate to an even flow automatically from a Control operation/Control cabin
- (b) Bitumen Control Unit
Capable measuring metering and spraying required quantity of bitumen at specified temperature with automatic synchronization of bitumen and aggregate feed.

(c) Filler system

A fine feeder system suitable to receive bagged or bulk supply of filler materials and its incorporation to the mix in the correct quantity shall be necessary auxiliary

(d) Dust Control

A suitable built in Dust control equipment for the dryer to contain the exhaust of fine dust in to atmosphere for environmental control, wherever so specified by the Engineer.

(e) Suitable auxiliary Bitumen Boiler of Adequate capacity with self heating arrangement and temperature control device the boiler should be fitted with temperature indicating instruments.

The temperature of binder at the time of mixing shall in the range of 160-177 c and of aggregates in range of 155-163C C provided also that at no time shall be the difference in temperature between the aggregates and the binder exceed 14 C

Mixing shall be thorough to ensure that a homogeneous mixture is obtained in which all the particles of the mineral aggregates are coated. uniformly.

The mix shall be transported from the mix plant to the point of use in suitable vehicles. The vehicles employed for transport shall be clean and covered over the transit if so directed by the Engineer-in-charge.

Spreading

The mix transported from the drum mix plant to the site shall be spread by means of a self propelled mechanical paver with suitable screeds capable of spreading, temping, finishing the mix. true to specified grade, lines and cross sections, the temperature of mix at the time of laying shall be in the range 121-163 C

Longitudinal joints and edges shall be constructed true to the delineating lines parallel to the center line of the road. Longitudinal joints shall be off-set by the least 150mm from those in the binder course. All joints shall be cut vertical to the full thickness of the previously laid mix and the surface painted with not bitumen before placing fresh materials.

Rolling

Immediately after the spreading of mix it shall be thoroughly compacted by rolling with a set of 80 to 100 KN vibrator rollers moving at a speed not exceeding 5 Km. per hour. The initial or break down rolling shall be done with 80-100 KN static weight smooth wheel roller, three wheel rollers and the surface finished by final rolling with vibrator system shall be switched off.

The roller wheels shall be kept damp to prevent the mix from adhering to them but in no case shall fuel, lubricating oil be used for this purpose. Rolling shall commence longitudinally from the edge and progress towards the center, except that on super-elevated portions, it shall progress from the lower to upper edge parallel to the fresh edge. Each of the rollers shall uniformly overlap not less than one third of the track made in compaction and all the roller marks eliminated.

Opening of traffic

The traffic may be allowed immediately after completion of the final rolling when the mix has cooled down to the surrounding temperature.

Surfacing finish & Quality control of work

The surface finish of construction shall conform to the requirement of MOST

Specification clause 901. Control on the quality of material and works shall be exercised by the Engineer-in-charge in accordance with MOST specification, Clause 902.

Arrangement for Traffic

The provision of MOST specification clause –105 shall apply as regards that flow of traffic during construction.

Measurement for Payment :

The payment shall be made on the tonnage basis of the weight of mix of aggregates and bitumen for this purpose. The contractor shall have to install a weight bridge of suitable capacity for the purpose of weighing of dumpers at suitable place at his cost as directed weight of empty and weight of loaded dumper will be recorded in bound and numbered register on plant site Department will be free to get some loaded dumpers test checked at other weight bridge Weight bridge will be periodically got calibrated and verified from weight and measure authorities.

For the purpose of application of tack coat, if the theoretical area as per sanctioned estimate for basis of tonne differs with the actual area of work done in the field, the reduction in or addition to payment shall have to be exceed respectively

Weight of mix materials will be done in presence or responsible person, not less than the rank of supervisor of department and the measurement shall be recorded by the Deputy Executive or Assistant Engineer or Addl. Asst. Engineer if so authorized, Record of each dumper will be maintained separately in bound and numbered register, which will be maintained by the departmental representative and signed by the contractor, Proper gate pass system shall be established for the vehicles coming to the plant site and out going from the plant site. The location of the kilometer, hecto meter and meter in which individual dumber are unloaded be recorded carefully.

Rate

The contract unit rate for mix seal surfacing shall be paid in full for carrying out the required operations including full compensation for all components.

- (i) Making arrangements for traffic to Clause 112 except for initial treatment to verge, shoulders and construction of diversion.
- (ii) Preparation of base except for laying of profile corrective course but including filling of potholes.
- (iii) Providing all materials to be incorporated in the work including arrangement for stock yards, all royalties, fees rents where necessary and all leads and lift.
- (iv) All labour, tools equipment's plant including installation of hot mix plant power supply units and all machineries, incidental to complete the work to the specifications
- (v) Carrying out the work in part widths of the road where directed.
- (vi) Carrying out all tests for control of quality.

E.E.