

Name of Work :- C.R. to NH-51 bypass section (Providing Asphalt patch work on
NH-51 bypass section)

SPECIFICATION

Item No. 1:-

Providing, laying and rolling of open - graded premix surfacing of patch work composed of 11.2mm to 0.09mm (Type A) aggregates using tack coat of Emulsion RS-1 @ 2.50 Kg / 10.00 Sqmt with using viscosity grade VG-30 bitumen for mixing @ 51.00 Kg/M.T. of total weight of mix to required line, grade and level to serve as wearing course on a previously prepared / existing damaged base, including mixing in a suitable hot mix plant of appropriate capacity not less than 50 tonnes/hour, laying manually and rolling with a smooth wheeled roller, finished to required level and grades as directed by the Engineer in Charge.

SCOPE :

This work shall consist of laying and compacting mix seal surfacing in a 20 m single course composed of suitable aggregates premixed with a bituminous binder on a previously prepared base, in accordance with the requirements of these specifications to serve as a 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.

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 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.

TABLE 500-3 PHYSICAL REQUIREMENTS OF AGGREGATES FOR BITUMINOUS MACADAM

Property	Test	Specification
Cleaniness	Grain size analysis	Max 5% passing 0.07 mm sieve
Particle shape	Flakiness and Elongation Index (Combined) ²	Max 30%
Strength*	Los Angeles Abrasion Value ³ Aggregate Impact	Max 40 %

	Value3	
Durability	Soundness4 Sodium sulphate Magnesium Sulphate	Max 30 % Max 40 % Max 40 %
Water Absorption	Water Absorption5	Max 12 %
Stripping	Coating and stripping of Bitumen Aggregate Mixtures6	Max 18 %
Water Sensitivity	Retained Tensile Strength	Max %

Aggregate grading and binder content :When tested in accordance with IS:2386 Part I (we sieving method) the combined aggregate grading for the particular mixture shall fall within the limits shown in Table 500-4 for the grading specified in the Contract. The type and quantity of bitumen and appropriate thickness, are also indicated for each mixture type.

*Aggregates may satisfy requirements of either of the two tests..

** To determine this combined proportion, the flaky stone from a representative sample should first be separated out. Flakiness index is weight of flaky stone metal divided by weight of stone sample. Only the elongated particles be separated out from the remaining (non-flaky) stone metal. Elongated 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 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 course and fine aggregate shall be so graded C.R. combined as to confirm to the grading set forth in table 500-10.

Aggregate Gradation for Mix Seal Surfacing.

IS Sieve Designation	Cumulative Percent by weight of total passing the sieve
13.2 mm	100
11.20 mm	88-100

5.60 mm	31-52
2.80 mm	5-25
90 micron	0-5

Proportioning of materials:

The total quantity of the aggregates used for mix seal surfacing shall be used to achieve required 20 mm compacted thickness.

The quantity of binder used for used for premixing in terms of straight run bitumen shall be 5.10% by weight of the total mix i.e.51.00kgs per ton 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 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 the specified lines; grade and cross sections in accordance with M.O.S.T. specification, as directed by the Engineer-in-charge. The surface shall be thoroughly swept and scraped, dean and free of dust and foreign matter.

Preparation and transportation of Mix:

Mix seal surfacing mix shall be prepared in a drum nix 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 production uniform mix within the job mix formula such a 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 flood 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 anb 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 be in the range of 160-177 C and of aggregates in the range of 155-163 C provided also that at no time shall be the difference in temperature the aggregates and the binder exceed 14 C

Mixing shall be thorough to ensure at the 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 vehicle employed for transport, shall be clean and covered over the transit if so directed by the directed by the Engineer-in-charge.

SPREADING:

The mix transported from the drum mix plant to the site shall be spread by means of manually with temping, finishing the mix, true to specified grade, line and cross sections. The temperature of mix at the time of laying shall be in the range 12-163 C.

Longitudinal joints and edge 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 150 mm 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 roller moving at a speed not exceeding 5 km, per hours. The initial or break down rolling shall be with 8-10 ton tandem rollers or suitable pneumatic rollers.

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 from the lower to upper edge parallel to the fresh material with rear or mixed wheel loading so as to minimize the pushing o the mix and each pass of the roller shall uniformly overlap not less then one third of the track made in the preceding pass. Tolling shall continue until the entire surface has been rolled to compaction and all the roller marks eliminated.

Opening to traffic:

The traffic may be allowed immediately after completion of the final rolling when the mix has cooled down to the surrounding temperature. Excessive traffic speeds should not be permitted.

Surfacing Finish & Quality Control for work :

The Surfacing finish & construction shall conform to the requirement of MORT &H Specification table 900-1. Control on the quality of material and works shall be exercised by the Engineer-in-Charge in accordance with MORT&H specification.

Surface Levels:

The levels of the subgrade and different pavement courses as constructed, shall not vary from those calculated with reference to the longitudinal and cross profile of the road shown on the drawing or as directed by the engineer beyond the tolerances mentioned in Table 900-1.

TABLE 900-1. TOLERANCES IN SURFACE LEVELS

1.	Subgrade	+20 mm -25 mm
2.	Sub-base + 10mm (a) Flexible pavement (b) Concrete pavement (Dry lean concrete or Rolled concrete)	-20 mm + 6 mm -10 mm
3.	Base – course for flexible pavement (a) Bituminous course (b) Other than bituminous (i) Machine laid (ii) Manually laid	+ 6 mm - 6 mm + 10 mm - 10 mm + 15 mm - 15 mm
4.	Wearing course for flexible pavement (a) Machine laid (b) Manually laid	+ 6 mm - 6 mm + 10 mm - 10 mm

5.	Cement concrete pavement	+ 5 mm - 6 mm
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Agreement for Traffic:

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

Passage of Traffic along a part of the Existing Carriageway under Improvement.

For widening/strengthening existing carriageway where part width of the existing carriageway is proposed to be used for passage of traffic, treated shoulders shall be provided on the side on which work is not in progress. The treatment to the shoulder shall consist of providing at least 150 mm thick granular base course covered with bituminous surface dressing in a width of at least 1.5 m and the surface shall be maintained throughout the period during which traffic uses the same to the satisfaction of the Engineer. The continuous length in which such work shall be carried out, would be limited normally to 500 m at a place. However, where work is allowed by the Engineer in longer stretches passing places at least 20 m long with additional paved width of 2.5m shall be provided at every 0.5 km. interval.

In case of widening existing two-lane to four-lane the additional two lanes would be constructed first and the traffic diverted to it and only thereafter the required treatment to the existing carriageway would be carried out. However, In case where on the request of the Contractor, work on existing carriageway is all allowed by the Engineer with traffic using part of the existing carriageway, stipulations as in para above shall apply.

After obtaining permission of the Engineer, the treated shoulder shall be dismantled, the debris disposed of and the area cleared as per the direction of the Engineer.

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 as per above details 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, rent where necessary and all leads and lift.
- (iv) All labour, tools, equipment, 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 width of the road where directed.
- (vi) Carrying out all tests for control of quality.

Measurement for Payment :

For this purpose, the contractors shall have to install a weight bridge of suitable capacity for the purpose of weight of loaded dumper will be recorded in bound and numbers test checked at other weight bridge. Weigh Bridge will be periodically got calibrated, verified and satisfied from weight and measure authorities.

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

Weight of mix materials will be done in presence of responsible person, not less than the rank of supervisor of department and the measurement shall be recorded by the Deputy Executive Engineer or Assistant Engineer or Addl. Asst. Engineer. If so authorized, Record of each will be maintained by the department representative 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, hectometer and meter in which individual dumper are unloaded be recorded carefully.

The payment shall be made on the Tonnage basis of the weight of mix of aggregates and Bitumen.

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