

MoRTH Clauses 514

513.7 Arrangements for Traffic

During the spraying operations, arrangements for traffic shall be made in accordance with the provisions of Clause 112. The surface should not be opened to traffic for 24 hours after spraying. If pick-up does occur a light blinding of crusher dust or sand should be applied.

513.8 Measurement of Payment

Fog spray and blinding (if used) shall be measured in terms of surface area of application, for the area covered, in square metres.

513.9 Rate

The contract unit rate for fog spray and blinding (if used) shall be payment in full for carrying out the required operations including full compensation for all components listed in Clause 501.8.8.2. (i) to (xi) as applicable to the work specified in these Specifications.

514 MICRO-SURFACING

514.1 Scope

The work shall consist of design, testing and construction of micro-surfacing composed of modified bitumen emulsion, mineral aggregate, water and necessary additives (if needed), proportioned, mixed and uniformly spread over a properly prepared surface for surface treatment of pavements in accordance with these Specifications.

514.2 Type of Mirco-Surfacing

Micro-surfacing is applied on an existing pavement surface which is structurally sound but the surface shows signs of premature ageing, aggregate loss, cracking, high degree of polishing etc, It may be used as surface sealing treatment to improve skid resistance, surface durability, to seal fine and medium cracks and for preventive maintenance and periodic renewal treatment on low and medium traffic roads. Types of micro-surfacing and rates of application are given in Table 500-31.

Table 500-31 : Types of Micro-Surfacing and Rate of Application

Items	Type II (4 to 6 mm)**	Type III (6 to 8 mm)**
Application	Preventive and Renewal Treatment for Roads Carrying <1500 CVPD	Preventive and Renewal Treatment for Roads Carrying 1500 to 4500 CVPD
Quantity of mix* (kg/m ²)	8.4 to 10.8	11.1 to 16.3
Residual binder (percentage by weight of dry aggregate)	6.5 to 10.5	5.5 to 10.5

* By weight of dry aggregate.

** Indicative only.

514.3 Materials

514.3.1 Binder

The bitumen emulsion shall be a modified bitumen emulsion conforming to requirements specified in Table 500-32. The modifier shall be polymer/rubber, preferably synthetic or natural rubber latex.

Table 500-32 : Requirement of Modified Bitumen Emulsion for Micro-Surfacing

Requirements	Specifications	Method of test
Residue on 600 micron IS sieve (percent by mass), maximum	0.05	IS: 8887
Viscosity by Say bolt Furol Viscometre, at 25°C, in second	20-100	IS :8887
Coagulation of emulsion at low temperature	Nil	IS :8887
Storage stability after 24 h (168 h), % maximum	2(4)	IS :8887
Particle charge, + ve/-ve	+ ve	IS :8887
Tests on residue:		
a) Residue by evaporation, % minimum	60	IS :8887
b) Penetration at 25°C/100 g/5 s	40-100	IS :1203
c) Ductility at 27°C, cm, minimum	50	IS :1208
d) Softening point, in °C, minimum	57	IS :1205
e) Elastic recovery*, %, minimum	50	IS :15462
f) Solubility in tri-chloroethylene, % minimum	97	IS :1216

* In case, elastic recovery is tested for Torsional Elasticity Recovery as per Appendix-8 of IRC:81, the minimum value shall be 20 percent.

514.3.2 Aggregates

As per Clause 512.3.2 (Type II and Type III Grading, Table 500-27).

514.3.3 Filler

As per Clause 512.3.3.

514.3.4 Water

As per Clause 512.3.4.

514.3.5 Additives

As per Clause 512.3.5.

514.4 Design and Proportioning of Micro-Surfacing Mix

514.4.1 The design criteria for micro-surfacing mixture is specified in Table 500-33. The mix design report shall clearly show the proportions of aggregate, filler, water and residual bitumen content based on the dry weight of aggregates and additives used (if any). The set time shall be determined by the method given in Appendix-2 of IRC:SP:81.

Table 500-33 : Mix Design Criteria for Micro-Surfacing Mix

Requirements	Specifications	Method of Test as given in IRC:SP:81
Mix time, minimum	120 s	Appendix-1
Consistency, maximum	3 cm	Appendix-3
Wet Cohesion, within 30 min, minimum.	12 kg cm	Appendix-4
Wet Cohesion, within 60 min, minimum	20 kg cm	Appendix-4
Wet stripping, pass %, minimum	90	Appendix-5
Wet track abrasion loss (one hour soak), maximum	538 g/m ²	Appendix-6

514.4.2 Aggregate, modified bitumen emulsion, water and additive (if used), shall be proportioned by weight of aggregate utilizing the mix design approved by the Engineer. If more than one type of aggregates is used, the correct amount of each type of aggregate used to produce the required grading shall be proportioned separately prior to adding other materials of the mixture, in a manner that will result in a uniform and homogenous blend. Final completed mixture, after addition of water and any additive, if used shall be such that the micro-surfacing mixture has proper workability and permit traffic within a short period depending upon the weather conditions without occurrence of ravelling and bleeding. Trial mixes shall be prepared and laid for the designed mix and observed for breaking time and setting time. The wet track abrasion test is used to determine the minimum residual bitumen content. Indicative limits of various ingredients for job mix of micro-surfacing shall be as given in Table 500-34.

Table 500-34 : Indicative ingredients in mix

Ingredients	Limits (Percent Weight of Aggregate)
Residual bitumen	6.5 to 10.5 for type II and 5.5 to 10.5 for Type III
Mineral filler	0.5 to 3.0
Additive	As needed
Water	As needed

514.5 Construction

As per Clause 512.5.

514.5.1 Weather and Seasonal Limitations

As per Clause 512.5.1.

514.5.2 Surface Preparation

As per Clause 512.5.2.

514.5.3 Application of Tack Coat

As per Clause 512.5.3.

514.5.4 Machine

As per Clause 512.5.4.

514.5.5 Calibration of Machine

As per Clause 512.5.5.

514.5.6 Application of Micro-Surfacing

A calibrated micro-surfacing machine as per requirements of job mix shall be used to spread the material. The surface shall be pre-wetted (if required under extreme hot weather conditions) by spraying water ahead of the spreader box. The rate of application of spray shall be adjusted during the day to suit temperature, surface texture and humidity. The application of micro-surfacing shall be as per Clause 512.5.6.

514.5.7 Rate of Application

The micro-surfacing mixture shall be of proper consistency at all times so as to provide the application rate required by the surface condition. The quantities of micro-surfacing mix (by weight of dry aggregate) to be used shall be as given in Table 500-31.

514.5.8 Rolling

As per Clause 512.5.8.

514.5.9 Quality Control and Surface Finish

The surface finish of construction shall conform to the requirements of Clause 902. For control of the quality of materials and work carried out, relevant provision of Section 900 shall apply.

514.6 Control of Traffic

Micro-surfacing mix requires about 2 hours to set. Traffic may be opened only after 2 hours restricting the speed to 20 km/h till 12 hours thereafter.

514.7 Arrangements for Traffic

During the period of construction, arrangements for traffic shall be made in accordance with the provisions of Clause 112.

514.8 Measurement for Payment

Micro-surfacing shall be measured as finished work as specified, in square metres.

514.9 Rate

The contract unit rate for micro-surfacing shall be payment in full for carrying out the required operations including full compensation for the specified rate of application of the mix and the quantity of residual binder. The variation in rates of actual application shall be suitably adjusted plus or minus as provided in the Contract. The contract unit rate shall include full compensation for all operations listed in Clause 501.8.8.2.

515 STONE MATRIX ASPHALT (SMA)**515.1 Scope**

This work shall consist of construction in a single or multiple layer of fibre-stabilized SMA for use as wearing course/ binder course on a previously prepared bituminous bound surface. The 13 mm SMA in this Specification shall be used for wearing course with nominal layer thickness of 40 to 50 mm. The 19 mm SMA shall be used for binder (or intermediate) course with nominal layer thickness of 45 to 75 mm.

515.2 Materials**515.2.1 Bitumen**

The bitumen for fibre-stabilized SMA shall be viscosity grade paving bitumen conforming to Indian Standard Specification IS:73 or Modified Bitumen complying with IS:15462 and IRC:SP:53 of appropriate type and grade capable of yielding the design mix requirements, and as per Table 500-2.