Re-surfacing on Structures & Approaches with Micro-Surfacing Type – III (Phase – II) at Yamuna Expressway Chainage – KM 95.00 to KM 165.00 from Mathura to Agra, Uttar Pradesh, India

Vol-II

Special Conditions of Contract (SCC)

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SPECIAL CONDITIONS OF CONTRACT

SECTION – 1

GENERAL

1.0 INTRODUCTION:

Jaypee Infratech Limited (hereinafter referred to as 'JIL') is an Indian infrastructure development company which has developed the Yamuna Expressway and engaged in the development of related real estate projects. JIL a subsidiary of the Jaypee Group, was incorporated on April 5, 2007, as a Special Purpose Vehicle (SPV) to develop, operate and maintain the Yamuna Expressway in the state of Uttar Pradesh, connecting Noida and Agra.
JIL has constructed 165 km long 6 lane Yamuna Expressway project from Noida to Agra on BoT basis and ribbon development on 6,175 acres at five locations along the expressway for commercial, industrial, institutional, residential and amusement purposes, is also being undertaken as an integral part of the project.

JIL has constructed 165 km long 6 lane Yamuna Expressway project from Greater Noida to Agra. Yamuna Expressway Road has 3 main toll plazas at Jewar at KM 38, Mathura at KM 95 and Agra at KM 150. Yamuna expressway is operational since 2012. Camp offices are established at all 3 main toll plazas for smooth and effective functioning of expressway operations. There are several roadside facilities such as Food & Beverage facility, Fuel Station, and Workshops on expressway.

SECTION – 2

SCOPE OF WORK

Bids are being invited from experienced and eligible contractors for the Assignment. The successful Bidder, duly appointed by the JIL for the Assignment, Re-surfacing on Structures & Approaches with Micro-Surfacing Type – III (Phase – II) at Yamuna Expressway Chainage – KM 95.00 to KM 165.00 from Mathura to Agra, Uttar Pradesh, India.

2.1 The scope of work shall also include but not limited to the following:

2.1.a Associated civil works:

Laying of Micro-surfacing Type – III 6-8mm (six to eight millimetre) thick layer comprising of crushed aggregate of specific size conforming to Type-III grading @14 Kg per Sqm (Fourteen Kilogram per square metre) of road surface coverage , Polymer Modified Cationic Bitumen Emulsion @ 12% (at the rate of twelve percent) of weight of aggregate, Portland cement as a Mineral filler @ 2% (at the rate of two percent) of by weight of crushed aggregate , Break Control Additives @ 2% (at the rate of two percent) of by weight of crushed aggregate and Purified Water with PH 6-7 as needed, using specialized micro spacing paver and other material, machinery etc. micro surfacing paver should be equivalent to BREINING / BERGKAMP / VSS with spreader box of 3.7 Mtr. so that each lane could be covered in a single in single pass and as per IRC : SP:81-2008 and provision 512-514 of MoRTH specifications 5th revision.

2.1.b Shop Drawings :

All the shop drawings shall be prepared through AutoCAD System based on Architectural Drawings. Shop drawings shall be submitted for approval within 02 weeks in advance of planned delivery and installation of any material to allow Consultant ample time for scrutiny. No claims for extension of time shall be entertained because of any delay in the work due to his failure to produce shop drawings at the right time, in accordance with the approved program.

2.1.c Project Quality Plan:

The contractor must submit the project quality plan to client at the time of award of contract to get the approval of the same. The contractor has to work accordingly to maintain the quality of work.

2.1.e Inspection and testing of materials:

The Contractor shall, if so required, produce manufacturers' test certificates of all batches of materials supplied by him. The tests carried out shall be as per relevant Indian Standards and shall be carried out at Government approved test facility as

specified by the Engineer in-charge. Testing frequency will be as decided by the Engineer-in-charge and as mentioned in the technical specification.

2.1.f Maintenance during defect liability period:

Complaints: The Contractor shall receive calls for any and all problems experienced under this contract, contractor shall attend to these within 2 hours of receiving the complaints and shall take steps to immediately correct any deficiencies that may exist.

Repairs: Any type of repairing due to poor quality of work or material, need to be repaired by the contractor during the defect liability period. All replacement parts and labour shall be supplied promptly free-of-charge to the Owner.

2.1.g The bidder has to get the design approved from competent Authority. The expenditure so on this account shall be borne by the bidder/ contractor.

2.1.h The timeline is essence of project and continuous monitoring shall be done by all concerned including JIL.

2.1. i Works will be carried out as per MORTH specifications Clause No. 512 & 514 5th Revision and IRC Guideline SP81:2008, specifications as mentioned in the tender document wherever mentioned or as per direction of Engineer- In – Charge (EIC) shall be final.

2.1. j The bidder shall comply all the norms of National Green Tribunal/ Central/State Pollution Control Board/Statutory bodies during execution of work.

2.2 COMPLIANCE WITH STATUTES, REGULATIONS AND LAWS

The Contractor shall familiarize themselves and conform in all aspects with: -

(a) the provisions, their legal interpretation in respect of any enactment and relevant judicial/administrative/quasi-judicial orders in India, as is and/or may become, applicable from time to time, related to or having impact on any aspect affecting the works
(b) The regulations or bye-laws of any local body and utilities.
(c) The Contractor shall be bound to give all notices required by statute, regulations or by-laws, as aforesaid and to pay all fees and bills payable in respect thereof. The Contractor will arrange necessary clearances and approvals before the Work is taken up.
(d) Ignorance of Rules, Regulations and Bylaws shall not constitute a basis for any claim at any stage of work.
(e) The Contractor shall indemnify the JIL against all penalties and

liabilities of every kind of breach of any such enactment, laws, regulations, bye-laws or rules.

SECTION – 3

Additional Conditions

3.1 Statutory Fee Payment

Statutory fees, if any paid to the local bodies/Authorities in connection with the approval of the project / connection of the services/shifting of the services by the contractor shall be borne by the contractor. The cost of restoration of any services damaged by the contractor during execution shall however be borne by the contractor.

3.2 Guarantee/Warranty

All materials installed shall be guaranteed or warrantied (as per applicability of guarantee/warranty given by the manufacturer) against un-satisfactory performance, material, manufacture, workmanship or installation. The material or component or any part thereof so found defective during the guarantee/warranty period shall be repaired or replaced free of cost to the satisfaction of the Engineer in-charge. In case it is felt by JIL that undue delay is being caused by the contractor in doing this, the same will be got done by JIL at the risk and cost of the contractor. The decision of Engineer-in-charge in this regard shall be final.

3.3 Temporary Barricades & Dust Mitigation measures

a) The provisions of Ministry of Environment, Forest and Climate Change Notification standards for implementation of dust mitigation measures dated 25th January 2018 for Construction and Demolition activities shall be followed.

b) The barricading shall be provided at respective stretches till completion of the work and to be removed as soon as possible after completion of the same at particular stretch for smooth functioning of traffic. The barricading shall include the following without any extra cost:

   i. Traffic signals during construction at site for day and night, reflective signs, direction boards, marking, glow lamps, marking, caution tape,

traffic signage as per requirement, flags, Traffic Marshals etc. as directed by the Engineer-in-Charge.

ii. Installation of temporary warning signs/lamps on all barricades during the hours of darkness and kept it lit there at all times during these hours.

iii. Shifting and re-fixing in position as per the direction of Engineer-in-Charge and all incidentals to execute the job as many times as directed by Engineer-in-Charge.

iv. Repainting of the barricading after regular interval as directed by Engineer-in-Charge.

v. Proper maintenance of the barricading till completion of the work by repairing/replacing the damaged barricade.

vi. The barricades shall be maintained in line and level.

viii Barricading is also required to be erected by the contractor at his own cost for segregating the area of work.

ix The barricading work shall be considered as a temporary work and the material used for this purpose will be treated as the Contractor's own property. The barricading shall be dismantled and site to be cleared off / make good on completion of the project or as and when directed by Engineer-in-charge.

3.4 Anti-Smog gun for controlling localized (50 to 75mm) dust

During the period of execution, contractor to provide anti-smog guns for controlling the localised dust pollution in respect of compliance of order of Hon'ble Supreme Court of India dated 13.01.2020.

3.5 Disposal of surplus excavated earth/ Soils

The Contractor shall be deemed to have taken into account the quantum of excavation involved and that the surplus excavated earth remaining after use in operations and to be disposed-off by him.

It will be the responsibility of the Contractor to get the permission for yard for dumping the surplus excavated earth from local authority, if required. If any royalty/fee is payable to local authority, such royalty/fee shall also be borne by the Contractor. Disposal shall be carried out strictly as per the regulations of local authority.

The contractor shall store the excavated earth required for operations at his own place other than the project site under his safe custody at his own cost. Thereafter, the earth so stored shall be backfilled at site at the appropriate time. The cost of storage, transportation (to & from site), handling etc. shall be borne by the contractor.

The contractor shall also make his own arrangement for the disposal of the spoils from the works to such place where the same shall not cause nuisance and should be acceptable to the authorities concerned without any cost to JIL.

3.6 House- keeping

i. Housekeeping is the act of keeping the working environment cleared of all unnecessary waste, thereby providing a first line of defence against accidents and injuries. General Housekeeping shall be carried out by the contractor and ensured at all times at Work Site, Construction Depot, Fabrication Yard, Workshop, Batching Plant, Labour Camp, Stores, Offices and toilets/urinals etc. The contractor shall be responsible to provide segregated containers for disposal of debris at required places and daily cleaning of the same.
ii. All passageways shall be maintained without any blockages or obstructions.
iii. All surplus earth and debris shall be removed/ disposed-off from the working areas immediately. Trucks carrying sand, earth and any pulverized materials etc. shall be covered while moving in order to avoid dust or odour impact. The tyres of the trucks leaving the site shall be cleaned with water, wherever the possibility of spillage on carriageways meant for regular road traffic exists.
iv. No parking of trucks/trolleys, cranes and trailers etc. shall be allowed on roads, which may obstruct the traffic movement.
v. Roads shall be kept clear and materials like: pipes, steel, sand boulders, concrete, chips and brick etc., shall not be allowed on the roads to obstruct free movement of road traffic.
vi. Water logging on roads shall not be allowed.
vii. Proper and safe stacking of material are of paramount importance at fabrication stores, stores and such locations where material would be unloaded for future use. The storage area shall be well laid out with easy access and material stored / stacked in an orderly and safe manner.
viii. Flammable chemicals, compressed gas cylinders etc. shall be safely stored. Unused/surplus cables, steel items and steel scrap lying scattered at different places within the working areas shall be removed to identified locations(s). All wooden scrap, empty wooden drums and other combustible packing materials shall be removed from the site.

ix. The compliance of above provisions is deemed to be included in the quoted amount of the contractor and no claim / payment whatsoever shall be entertained on this account.

3.7 **Unforeseeable Difficulties**

Except as otherwise specifically stated elsewhere in the Contract:

a. The Contractor shall deem to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Works;
b. By signing the Contract, the Contractor accepts total responsibility for having foreseen all difficulties and costs of successfully completing the Works; and
c. The Contract Price shall not be adjusted to take account of any unforeseen difficulties or costs.

3.8 Contractor's Obligation on Work Methodology.

a. During a mix design, contractor should assess the aggregate, Polymer Modified Bitumen Emulsion, water, mineral filler, and other additives' compatibility to ensure the project's success.
b. All material components – aggregate, Polymer Modified Bitumen Emulsion, water, and additives – must individually be tested and satisfy the work requirements and testing standards.
c. To make sure that micro-surfacing is applied correctly, a contractor needs to be aware of temperature and humidity levels and wind conditions. All three impact the amount of time required for water additives and field materials used during construction.
d. Before loading the mobile support unit, screen the material that will be used. This way, you can prevent any contamination when re-handling it.
e. All necessary repairs – Pothole Repairs need to be done prior to the Application of Layer of Micro-surfacing.
f. When filling ruts or low spots, it is impractical to measure the material needed. So do not specify an application rate for a levelling course when laying one down, as you may not know how much material would be required.
g. Inspections are integral to ensuring that a job is done correctly. When the materials change, conveyor seals and emulsion pumps have been replaced, ask for a recalibration by the contractor on-site to increase quality control within their workmanship.
h. When applying the crack sealing material, ensure that it is not too thick. If this happens, micro surfacing paver tires and spreader box

runners can pick up some of the excess sealants and carry it onto other areas intended to be left clean.

SECTION – 4

Technical Conditions

Micro-Surfacing Material and Work Methodology as Per MORTH Specification & IRC Guidelines.

1. Binder

The Bitumen shall be a modified Bitumen Emulsion confirming to requirements specified in Table mentioned below. The modifier shall be polymer/rubber, preferably synthetic or natural rubber latex.

Requirement of Modified Bitumen Emulsion for Micro-Surfacing

(Table 500-32 of MoRTH Spec.)

Test Name	Specifications	Test Method
Residue on 600 micron IS Sieve (% by mass), Maximum	0.05	IS : 8887
Viscosity by Say Bolt Furol Viscometer, at 25o C , in second	20-100	IS : 8887
Coagulation of emulsion at low temperature	NIL	IS : 8887
Storage Stability after 24h (168 h), % maximum	2	IS : 8887
Particle charge, +ve/-ve	(+Ve)	IS : 8887
Test on Residue:		
Residue by evaporation, % minimum	60	IS : 8887
Penetration at 25oC/100g/5s	40-100	IS : 1203
Ductility at 27oC, cm, minimum	50	IS : 1203
Softening Point, in oC, minimum	57	IS : 1203
Elastic Recovery*, %, minimum	50	IS : 15462
Solubility in tri-chloroethylene, %, minimum	97	IS : 1216

In Case, elastic recovery is tested for Torsional Elastic Recovery as per Appendix -8 of IRC:SP:81-2008, the minimum value shall be 20%.

2. Aggregate

The mineral aggregates shall be crushed stone dust, clean, sharp, hard, durable, and uncoated dry particles and shall be free from soft pieces and organic and other deleterious substances. The aggregate shall satisfy the requirements and target grading shall confirm mentioned below.

Properties	Test Method	Specification
Sand Equivalent Value	IS:2720 (Part 37)	Min 50 %
Water absorption*	1S:2386 (Part 3)	Max 2 %
Soundness withSodium sulphate Magnesium sulphate	IS:2386 (Part 5)	Max 12 % Max 18 %

3. Filler

Mineral filler shall be Ordinary Portland Cement. The quantity of filler shall be in the range of 0.5 to 2 % by weight of dry aggregate.

4. Water

Water shall be potable, free from harmful salt and contaminants. The pH of the water shall be in the range of 6 to 7.

5. Additives

a. Chemical additives may be used to accelerate or retard the break-set time of the slurry or to improve the resulting surface finish. The quantity of additive, if used, shall be decided by mix design and to be adjusted as per the site/climate conditions. The specifications for additive shall be supplied by the supplier of the emulsion. The additive and emulsion shall be compatible with each other.
b. For Micro-surfacing with glass fibers special grade, AR glass fibers shall be added to the mix at the rate of 0.2% to 0.3% by weight of aggregate by special dispensing unit.

6. Design and Proportioning of Micro Surfacing Mix

The compatibility of aggregate, emulsion, filler and additive (if needed) shall be verified by mix design for a selected type and grading of aggregate as specified in Tables. The mix design report shall clearly show the proportions of aggregate, filler, water and residual bitumen content based on the dry weight of the aggregates, additive usage (if any). The design criteria for Micro Surfacing Mixture is specified in Table 500-33 mentioned below.

Mix Design Criteria for Micro Surfacing Mix

(Table 500-33 of MoRTH Spec.)

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/m2	Appendix-6

7. Plant, Machinery & Equipment's

Description	Qty	Remarks
Self-propelled Micro Surfacing Machine	02 No.	
Tipper / Trucks	04 No.	
Tractor Air Compressor	02 No.	
Screening Plant	02 No.	
Gensets for Lighting / Plant	02 No.	
Front End Loader	02 No.	
Milling Machine	1 No.	

Above will vary as per requirement of site.

8. Quality Control Laboratory (Field)

A Field Laboratory / QC Lab will be situated in Base Camp for quality control and routine testing as per frequency mentioned in Section 900 of MoRTH Spec./IRC: SP-81/IRC: SP-100.

9. Laying of Micro-Surfacing

9.1 Weather and Seasonal Limitations

Laying of Micro Surfacing shall not be undertaken, if either the pavement temperature or air temperature is below 10°C. However, during a dry spell, Micro Surfacing may be laid in rainy season also, even if the surface is wet but there is no stagnant water on the pavement.

9.2 Surface Preparation prior to Micro-Surfacing

The underlying surface on which the Micro Surfacing is to be applied shall be cleaned of all loose material, mud spots, vegetation and extraneous matter and shall be prepared and shaped to the needed profile. It is essential to pre-treat cracks on the pavement surface with an appropriate crack sealing material prior to application of slurry seal, if it is used for preventive/ renewal treatment. The surface should be swept clean by removing caked earth and other foreign matter with wire brushes, sweeping with mechanical brooms and finally dusting with air jet or high pressure water jet or other means approved by the Engineer.

9.3 Application of Tack Coat

Concrete Pavement, Tack coat of polymer modified micro surfacing emulsion at the rate of 3.00 Kg/Sqm. shall be applied after thorough cleaning of surface by pressure distributor.

9.4 Micro Surfacing Paver/Machine

The machine shall be specially designed and manufactured to lay Micro surfacing. It shall be self-propelled equipment, truck mounted, consisting of following sub-assemblies used to manufacture and simultaneously spread these mixes on the surface:

(i) Aggregate bin

(ii) Filler bin

(iii) Water and Emulsion Tanks

(iv) Additive Tanks

(v) Aggregates and filler conveyors to supply the mixer box

(vi) Pump or compressed air system to supply the emulsion/water

(vii) Mixer Box

(viii) Spreader box to place the mixed slurry on the job

9.5 Calibration of Machine

Micro Surfacing laying machine shall be calibrated for flow of all the constituents as per the job mix in presence of Engineer. No machine shall be allowed to work on the project until the calibration has been completed and accepted by the engineer. 2 kg samples of Micro Surfacing mix will be taken and verified for proportioning and mix consistency. The verification for application rate shall also be carried out in presence of the Engineer. The procedure for calibration and verification is as given in Appendix 7 of IRC: SP: 81-2008.

9.6 Application of Micro Surfacing.

As per MORTH Specification Clause No. 512.5.5 The Application of Micro-surfacing will be followed.

A calibrated Micro Surfacing machine, as per requirements of job mix, shall be used to spread the material. The surface shall be pre-wetted by fogging ahead of the spreader box (if required under hot weather conditions). The rate of application shall be adjusted during the day to suit temperature, surface texture and humidity. The mixture shall be agitated and mixed uniformly in the spreader box by means of twin shafted paddles or spiral augurs fixed in spreader box. A front seal shall be provided to ensure no loss of the mixture at the road contact point. The rear seal shall act as final strike off and shall be adjustable. The spreader box and real strike off shall be so designed and operated that a uniform consistency is achieved to produce free flow of material to the rear strike off. A secondary strike off shall have the same adjustment as the spreader box. The spreader box shall have the suitable means provided to side shift the box to compensate for variation in pavement geometry. Sufficient amount of material shall be always carried in all parts of spreader box so that a complete coverage is obtained. Overloading of the spreader box shall be avoided. No lumping, balling and unmixed aggregates shall be permitted. No streak, caused by oversized aggregates shall be left on the finished surface. Longitudinal joints shall correspond with the edges of existing traffic lanes. Other patterns of longitudinal joints may be permitted if pattern will not adversely affect the quality of finished surface. In case streak is formed, it shall be corrected immediately by fresh material and with use of squeegee. Longitudinal joints, common to two traffic lanes shall be butt joints with overlap not exceeding an average of 60-100 mm. The mixture shall be uniform and homogeneous after spreading on existing surfaces and shall not show separation of the emulsion and aggregates after setting.

9.7 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. (Ref: Clause 514.5.9 of MoRTH Spec).**WHERE EVER REQUIRED PTR ROLLER SHALL BE USED ESPECIALLY ON 4TH LANE WITH NO/MINIMUM TRAFFIC MOVEMENT.**