REQUEST FOR BID
(RFB)

IL&FS Transportation Networks Limited (ITNL)

Patratu Dam – Ramgarh Road (RPR-II) – Length 27.118 Kms and Chaibasa Kandra Chowka Road (CKC) - Length 68.700 Kms

Document downloading date	From 26th February, 2020 (11.00 Hrs) to 06th March, 2020 (11:00 Hrs)
Last date and time for receipt of Bids	06th March, 2020 (11:00 Hrs)
Date and time of opening of Technical Bids	13th March, 2020 at 15:00 Hrs
Date and time of opening of Financial Bids	Shall be intimated later
Place of Submission of Bids	IL&FS Transportation Networks Limited The IL&FS Financial Center, Plot C-22, G Block, Bandra Kurla Complex, Mumbai- 400051 Contact Person: Lakhan Khatri OR IL&FS Transportation Networks Limited, 443/A, Road No. 05, Ashok Nagar,Ranchi-834001, Jharkhand Contact Person: Gautam Tandasi
Place of opening of Bids	IL&FS Transportation Networks Limited The IL&FS Financial Center, Plot C-22, G Block, Bandra Kurla Complex, Mumbai- 400051 Tel.: +91 022-26593693, Facsimile: +91 022-26523979
Officer Inviting Bids	Mr RaviKumar Praveen IL&FS Transportation Networks Limited The IL&FS Financial Center, Plot C-22, G Block, Bandra Kurla Complex, Mumbai- 400051 Tel.: +91 022-26593693, Facsimile: +91 022-26523979

IL&FS Transportation Networks Limited
(ITNL)

BID DOCUMENT

For

Bituminous Overlay & Microsufacing Work at Patratu Dam – Ramgarh Road (RPR-II) – Length 27.118 Kms and Chaibasa Kandra Chowka Road (CKC) - Length 68.700 Kms in the State of Jharkhand (under JARDCL)

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IL&FS Transportation Networks Limited
(ITNL)
The IL&FS Financial Center, Plot C-22, G Block, Bandra Kurla Complex, Mumbai- 400051
Tel.: +91 022-26533333, Facsimile: +91 022-26523979, E-mail: itnl.projectbids@itnlindia.com
Website: www.itnlindia.com
CIN: U45203MH2000PLC129790

INVITATION FOR BID

Date: 26th February, 2020

Sub.: Patratu Dam – Ramgarh Road (RPR-II) – Length 27.118 Kms and Chaibasa Kandra Chowka Road (CKC) - Length 68.700 Kms in the State of Jharkhand (under JARDCL)

Dear Sir,

Please refer NIT dated 26th February, 2020 vide which sealed offline tenders have been invited for the above work.

(1) M/s IL&FS Transportation Networks Limited (ITNL), hereby invites sealed Bid from contractors for the work of "**Bituminous Overlay & Microsufacing Works at Patratu Dam – Ramgarh Road (RPR-II) – Length 27.118 Kms and Chaibasa Kandra Chowka Road (CKC) - Length 68.700 Kms in the State of Jharkhand under Jharkhand Accelerated Road Development Company Ltd (JARDCL)"**. The Major Maintenance activity is phased on to two parts. Part-A: Bituminous Overlay with Road Furniture and Part-B: Microsurfacing. The period for completion of the Bituminous Overlay Works shall be 5 months and for & Microsurfacing shall be 3 months while you will be required to maintain the Road for a Defect Liability Period of 12 months thereafter.

(2) Bidding documents may be downloaded by the contractors, free of cost, from the Employer's web site www.itnlindia.com from From 26th February, 2020 (11.00 Hrs) to 06th March, 2020 (11:00 Hrs)

(3) Bid must be accompanied by Bid Security amounting to Rs 28,00,000/- [Rupees Twenty Eight Lakhs Only] for Part-A Bituminous Overlay & Road Furniture Works & Rs 6,00,000/- [Rupees Six Lakhs Only]for Part-B Microsurfacing works in favour of **IL&FS Transportation Networks Limited**, payable at Mumbai. Bid Security shall be in the form as specified in the Bidding Document and shall have to be valid for 45 days beyond the validity of the Bid.

(4) Bid must be delivered to office of IL&FS Transportation Networks Limited**, The IL&FS Financial Center, Plot C-22, G Block, Bandra Kurla Complex, Mumbai- 400051** OR **IL&FS Transportation Networks Limited, 443/A, Road No. 05, Ashok Nagar,Ranchi-834001, Jharkhand on or before 1100 Hrs IST 06th March, 2020, 11:00 Hrs** by hand or by post/Courier, which will be opened on **13th March, 2020** at 15:00 hours IST, in the presence of the representative of the Bidders who wish to attend. If the office happens to be closed on the date of receipt of the Bids as specified, the Bids will be received and opened on the next working day as decided by the Employer at the time and venue to be notified to Bidders.

Signature of Authorised Officer

SECTION 1:

INSTRUCTIONS TO BIDDERS (ITB)

SECTION 1: INSTRUCTIONS TO BIDDERS

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A : GENERAL

1. Scope of Works

1.1 The IL&FS Transportation Networks Limited, (hereinafter be referred to as the **"Employer"**) proposes to execute the **Bituminous Overlay & Microsufacing Works at Patratu Dam – Ramgarh Road (RPR-II) – Length 27.118 Kms and Chaibasa Kandra Chowka Road (CKC) - Length 68.700 Kms in the State of Jharkhand** hereinafter referred to as the "**Overlay Works".**

The Overlay Works detailed herein is on Item Rate Contract basis. The indicative scope of work to be carried out by the successful Bidder, inter alia, includes the following but not limited to:

(i) Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor

(ii) Providing and laying bituminous concrete with thickness of 30mm of VG-40 or PMB 40 with 100-120 TPH batch type hot mix plant.

(iii) Road Marking with hot applied thermoplastic compound with Reflectorizing Glass Beads on Bituminous Surface

(iv) Road Studs/Cat eyes

(v) Bituminuous patchwork

(vi) Earthen shoulder

(vii) Microsurfacing

(a) <u>Defect Liability:</u>

(i) Subsequent to completion of the Works, Contractor shall be responsible for any defect arising in the executed work for a period of 12 Months from the Overlay works Completion Date as specified in the Contract Data.

The successful Bidder shall have full regard and be responsible for the safety of the Overlay Works/road users and all Project Site operations and for all methods of design for temporary structures, construction and maintenance of the Project Road and the Facility, irrespective of any approval or consent by the Employer and cost for the same is deemed to be included in the Bid Price, as incidental to work.

The successful Bidder shall take full responsibility for operation and maintenance of the existing road and facilities thereto and for Traffic and Safety Control, in accordance with Annexure–5B of Supplementary Technical Specifications of Section 5 from the Start Date. The cost of maintenance of the road, Barricading, traffic management, markings and signs, look-out persons, construction of temporary cross-drainage and road diversion works, and other similar works needed during implementation of Overlay works are deemed to be included by the Bidder in the Bid Price, as incidental to work.

The successful Bidder shall carry out his activities in connection with the Contract in such a manner so as to comply with the Environmental Management Plan in accordance with Annexure–5A of Supplementary Technical Specifications, Section 5 of Specifications and shall assume full responsibility for measures which are required to ensure such compliance

and cost for the same is deemed to be included in the Bid Price, as incidental to work.

1.2 The Employer is now inviting bids for **Bituminous Overlay & Microsufacing Works at Patratu Dam – Ramgarh Road (RPR-II) – Length 27.118 Kms and Chaibasa Kandra Chowka Road (CKC) - Length 68.700 Kms in the State of Jharkhand** as defined in the Contract Data and referred to as **"Overlay Works".**

1.3 The successful Bidder will be expected to complete the Overlay works by the Date as specified in the Contract Data and thereafter responsible for the defects for a period of one year.

2. Source of Funds

Deleted.

3. Eligible Bidders

3.1 All the Contractors who will produce the certificate that they have successfully completed following quantities in any one of the Financial Year during last 3 years are eligible to bid.

Sr. No	Item Description	Unit	Quantities executed
Part A	Bituminous Concrete Work (BC)	Cum	20,000
Part B	Microsurfacing	Sqm	3,50,000

3.2 Bidder should have turnover of Rs.25 Cr for Part-A: Bituminous Overlay & of Rs 5 Cr for Part-B: Microsurfacing for participation in Bid in any one of the Financial Year during last 3 years.

3.3 Bidders should not have abandoned any of their contracts for, and should not be under a declaration of ineligibility or blacklisted for corrupt, fraudulent and coercive practices or poor quality/ delayed implementation of any work by the Government of India (GoI), Government of Jharkhand (GoJ), other State Governments, JARDCL/ITNL/Developer and/or Statutory Authorities like National Highways Authority of India (NHAI), PWD etc.

3.4 Bidder should have operational hot mix plant of batch type having minimum 120 TPH capacity in Project vicinity. Bidder may also mobilise Movable Hot Mix Plant having minimum 120 TPH capacity.

3.5 Bidder should not be associated with on-going works of similar nature under JRPICL project.

4. Qualification of the Bidder

4.1 Bidders should submit, with their Bids, qualification information regarding the Road/Highway Works completed by them as defined in clause 3.1 & 3.2 and other information correct as on 28 days prior to last date of submission of Bids as per Form 2A, Qualification Information and Other Forms of Section 2.

4.2 All Bidders shall also include the following information and documents with their Bids in the formats prescribed, wherever applicable, in this Bidding Document:

(a) the certificate that they have successfully completed the quantities defined in clause 3.1 in any one of the Financial Year during last 3 years; either in the same project or any other completed projects.

(b) the certificate that they have turnover of Rs 25 Cr for Part-A: Bituminous Overlay & of Rs 5 Cr for Part-B: Microsurfacing for participation in Bid in any one of the Financial Year during last 3 years.

(c) written Power of Attorney authorizing the signatory of the Bid;

(d) latest Income Tax clearance certificate from the concerned department;

(e) major items of construction equipment proposed to carry out the Contract; {as per Clause 4.4 (a)}

(f) names of persons with sufficient qualifications and experience for site management and construction work should be proposed for the Project {as per Clause 4.4 (b)};

(g) an undertaking confirming the validity of above information

(h) deleted

(i) Information regarding any litigation or arbitration resulting from contracts executed by the Bidder in the last five years or currently under execution. The information shall include the names of the parties concerned, the disputed amount, duration of dispute, cause of litigation, matter in dispute and other relevant details; the Bidders shall also submit the information regarding debarring / expelling of Bidder or abandonment of work by Bidder (as per S. Nos. 1.4 & 1.5 of Form 2A of Section 2);

(j) deleted

(k) the proposed methodology and program of construction including Environment and Traffic Management Plans (barricading etc.), backed with equipment and resources planning and deployment, duly supported with broad calculations and quality control procedures proposed to be adopted, justifying the execution and completion of the Work as per Contract Specifications within the stipulated period of completion. The Bidder shall also submit his proposed Works Program and Monthly Cash Flow Forecast in forms at Annexures 3A and 3B, respectively;

(l) Any certification for the above information (Employer/Auditor/any other) shall be submitted in original form.

(m) Any true copies of documents/certificates shall be submitted duly attested or notarised by public notary.

4.3 Joint Venture (JV) is not allowed.

4.4 <u>Each Bidder shall demonstrate</u>:

(a) Availability of key construction equipment as minimum required is indicated in the Schedules at Annexures–1A. The equipment can be either owned or leased or rented. However, it is entirely the responsibility of the Contractor to deploy sufficient Plant and Equipment to ensure satisfactory compliance with his obligations under the Contract, during the execution of Overlay Works at the Site.

All Equipment provided by the Contractor at the site of Works shall be of the quality and capacity as approved by the Employer and shall be deemed to be exclusively intended for the execution of the Works, and all these shall be operated, used and maintained in a manner acceptable to the Employer.

(b) Availability of key personnel as stated at Annexures–1C and 1D. However, it is entirely the responsibility of the Contractor to deploy sufficient key personnel at his head office and at the site, to ensure satisfactory compliance with his obligations under the Contract.

(c) Deleted

4.5 Even though the Bidders meet the criteria set out above, they are subject to be declared non-responsive/rejected if they have:

(a) made misleading or false representations in the forms, statements and attachments submitted in proof of the qualification requirements; and/or

(b) record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures etc.; and/or

(c) have been black listed by any Statutory Agency/Employer during the intervening period between qualification and award of Works; and/or

(d) participated in bidding for any work and has quoted unreasonably high bid prices and could not furnish rational justification to the Employer.

5. One Bid per Bidder

5.1 Each Bidder shall submit only one Bid for the work. Bidder can opt out for submit Bid for Part A, Part B or for both Part A & B. The bids for Part A & B shall be submitted separately.

6. Cost of Bidding

6.1 The Bidder shall bear all costs associated with the preparation and submission of his Bid, and the Employer will in no case be responsible and liable for those costs.

7. Site visit

7.1 The Bidder, at the Bidder’s own responsibility and risk is encouraged to visit and examine the site and its surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract for the Works. The costs of visiting the site shall be at the Bidder's own expense and no claim shall be eligible in this regard.

B : BIDDING DOCUMENTS

8. Content of Bidding Document

8.1 The set of Bidding Documents consist of documents listed in the Table below and amendment/addenda issued in accordance with Clause 10 of this Section. A copy of Section 6 (Bill of Quantities), will be available along with the Bidding Documents to the Bidders to facilitate the Bidder to submit the copy of the duly filled Bill of Quantities.

Invitation for Bid		
Section 1	Instructions to Bidders	Volume 1
Section 2	Qualification Information and Other Forms	
Section 3	Part–I : General Conditions of Contract Part–II : Special Conditions of Contract	
Section 4	Contract Data	
Section 5	Specifications Part – I : General Technical Specifications Part – II : Supplementary Technical Specifications	
Section 6	Bill of Quantities	Volume 2
Section 7	Securities and Other Forms	

8.2 One copy of each of the Volumes 1 and 2 can be downloaded from the website. Documents to be furnished by the Bidder should be in the formats prescribed in Sections 2, 6 and 7 of the Bid Document and addendum issued pursuant to Clause 10.

9. Clarification on Bidding Documents

9.1 A Bidder requiring any clarification of the Bidding Documents may notify the Employer in writing through post, fax or e-mail (itnl.projectbids@itnlindia.com) at the Employer's address indicated in the Invitation to Bid. The Employer will respond to any request for clarification which he has received at least 3 days before the last date for receipt of Bids. Copies of the Employer's response will be uploaded on the web site at **www.itnlindia.com.**

9.2 Any modification of the Bidding Documents listed in Clause 8.1 which may become necessary as a result of the clarification given to Bidders shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause 10.

10. Amendment of Bidding Documents

10.1 Before the deadline for submission of bids, the Employer may modify the Bidding Documents by issuing addenda.

10.2 Any addendum thus issued shall be part of the Bidding Documents and shall be communicated at the Employer's web site. All such addenda shall become an integral part of the Bidding Document and it shall be incorporated in Bid prices and duly signed, stamped and submitted along with the Bid documents. Bid shall be deemed to be incomplete if the addendum (addenda) is (are) not enclosed duly signed by the Bidder along with the Bid documents.

C : PREPARATION OF BIDS

11. Language of the Bid

11.1 All documents relating to the Bid shall be in the English language.

12. Documents Comprising the Bid

12.1 The Bid submitted by the Bidder shall comprise the following:

Outer envelope marked as per Sub Clause 19.2 in two sets as "ORIGINAL" and "COPY".

In outer envelopes (ORIGINAL and COPY) the following two inner envelopes marked Volume (I) and Volume (II) along with the other information/materials and bearing identification and address as per Sub Clause 19.2.

Envelope (I) – marked as Bid security and qualification information

(a) Bid Security in prescribed Form 7B of Section 7.

(b) Qualification Information Form/certificates, undertaking etc. (in prescribed Forms 2A, 2B and 2C of Section 2).

Envelope (II)– marked as Form of Bid and Priced Bill of Quantities

(c) The Form of Bid (in prescribed Form 7A of Section 7). The Form of Bid needs to be submitted with bid amount in paragraph 1. (Preferably on letterhead of the Bidder duly stamped & signed by the Bidder).

(d) Bill of Quantities, needs to be on letterhead of the Bidder. Priced Bill of Quantities for Overlay works is specified in Section 6 (Annexure-1). The same needs to be submitted inclusive of GST and in line with clause 13

And any other material required to be submitted by Bidders in accordance with these Instructions to Bidders. The documents listed under Sections 2, 6 and 7 of Sub Clause 8.1 shall be filled in without exception.

12.2 The Bidder shall submit the Bids in two separate envelopes. One envelope marked (I) shall have submissions as per Sub Clause 12.1 (a) and (b). The second envelope marked (II) shall contain submissions as per Sub Clause 12.1 (c) and (d). The Bidder shall prepare two copies of each of these submissions, marking them **"ORIGINAL"** and **"COPY"** respectively, which shall be sealed and put in a covered envelope in accordance with the Sealing and Marking instructions in Clause 19.

12.3 Following documents needs to be duly signed, stamped and submitted along with the Bid, which will be deemed to be part of the Bid:

	Invitation for Bids
Section 1	Instructions to Bidders
Section 3	General Conditions of Contract and Special Conditions of Contract
Section 4	Contract Data
Section 5	Specifications

13. Bid Prices

13.1 The Contract shall be for the Works as described in Contract Data, based on the priced Bill of Quantities for Overlay Works submitted by the Bidder in prescribed Bid Form 7A of Section 7 and Annexure-1 of Section 6.

13.2 The Bidder shall fill in rates and prices and line item total (both in figures and words) for all items of the Bituminous Overlay or Microsufacing Works described in the **Bill of Quantities** along with total Bid Price (both in figures and words). Items for which no rate or price is entered by the Bidder will not be paid by the Employer when executed and shall be deemed to be covered by the other rates and prices in the Bill of Quantities. Corrections, if any, shall be made by crossing out, rewriting and initialing, in ink and with the signature & stamp at the place of correction.

13.3 All applicable duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause shall be included in the rates, prices and total Bid Price submitted by the Bidder.

13.4 Deleted

14. Currencies of Bid and Payment

14.1 The unit rates and the prices shall be quoted by the Bidder entirely in Indian Rupees(INR), and payment shall be made in Indian Rupees.

15. Bid Validity

15.1 Bids shall remain valid for a period not less than one hundred and twenty (120) days after the deadline date for Bid submission, specified in Clause 20. **A bid valid for a shorter period shall be rejected by the Employer as non-responsive.**

15.2 In exceptional circumstances, prior to expiry of the original time limit, the Employer may request the Bidders to extend the period of validity for a specified additional period. The request and the Bidders' responses shall be made in writing or by email. A Bidder may refuse the request without forfeiting his Bid security. A Bidder agreeing to the request will not be required or permitted to modify his Bid but will be required to extend the validity of his Bid security for a period of the extension, and in compliance with Clause 16 in all respects.

16. Bid Security

16.1 The Bidder shall furnish, as part of his Bid, a Bid Security for an amount mentioned in Invitation for Bid. **This Bid Security shall be in favour of "IL&FS Transportation Networks Limited"** Payable at Mumbai and may be in one of the following forms:

– A Bank Guarantee, in the prescribed format is acceptable from the following institutions located in India:

(a) State Bank of India or its subsidiaries;

(b) Any Indian Nationalized /Scheduled Bank;

(c) IDBI Bank or Axis Bank or ICICI Bank or HDFC Bank or Yes Bank; or

(d) Foreign Bank with operations in India provided the net worth in respect of the Indian operations shall not be less than Rs 500 crores as per the latest Annual Report of the Bank and that Bank Guarantee is issued by a branch in India.

– Bankers' cheque or Demand draft in favour of **"IL&FS Transportation Networks Limited"** payable at Mumbai.

16.2 Bank guarantees issued as surety for the Bid should be valid for 60 days beyond the validity of the Bid.

16.3 Any Bid not accompanied by an acceptable Bid Security and not secured as indicated in Sub Clauses 16.1 and 16.2 shall be rejected by the Employer as non-responsive.

16.4 The Bid Security of unsuccessful Bidders other than the evaluated responsive lowest three Bidders will be returned within 30 days of the completion of the Bid evaluation process and within the bid validity period, specified in Sub Clause 15.1. The Bid Security of two of the lowest three Bidders, other than the Successful Bidder, shall be returned after signing of the Contract Agreement with the Successful Bidder.

16.5 The Bid Security of the Successful Bidder will be discharged when the Bidder has furnished the required Performance Security and signed the Contract.

16.6 The Bid Security may be forfeited

(a) if the Bidder withdraws the Bid after Bid opening during the period of Bid Validity;

(b) if the Bidder does not accept the correction of the Bid Price, pursuant to Clause 27; or

(c) in the case of a Successful Bidder, if the Bidder fails within the specified time limit to

(i) furnish the required Performance Security, and/or

(ii) signing of the Contract.

(iii) Failed to follow the conditions of the bid documents/contract

17. Alternative Proposals by Bidders

17.1 Conditional offers or alternative proposals will not be considered. The Bids with any conditional nature shall be rejected as decided by the Employer. The bid shall be considered as unfit/unresponsive.

18. Format and Signing of Bid

18.1 The Bidder shall prepare one original and one copy of the documents comprising the Bid as described in Clause 12, and clearly marked **"ORIGINAL"** and **"COPY"** as appropriate. In the event of discrepancy between them, the original shall prevail.

18.2 The original and copy of the Bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder, pursuant to Sub Clauses 4.2 and 4.3. All pages of the Bid where entries or amendments have been made shall be initialed by the person or persons signing the Bid.

18.3 The Bid shall contain no alterations or additions, except those to comply with instructions issued by the Employer, or as necessary to correct errors made by the Bidder, in which case such corrections shall be initialed by the authorized signatory.

18.4 The Bidder shall furnish information as described in the Form of Bid (in Form 7A of Section 7) on commissions or gratuities, if any, paid or to be paid to agents relating to this Bid, and to contract execution if the Bidder is awarded the contract.

18.5 Deleted

D : SUBMISSION OF BIDS

19. Sealing and Marking of Bids

19.1 The Bidder shall seal the original and copy of the Bid together with the soft copy duly filled in separate envelopes as described in Sub Clause 12.2, duly marking the envelopes as "**ORIGINAL**" and "**COPY**". Envelope (II) shall be only submitted in hardcopy/physical form. These envelopes (called as inner envelopes) shall then be put inside one outer envelope.

19.2 The **outer** and two **inner** (marked (I) and (II)) envelopes shall

(a) be addressed to the Employer at the following address:

IL&FS Transportation Networks Limited
The IL&FS Financial Center,
Plot C-22, G Block, Bandra Kurla Complex,
Mumbai- 400051

(b) bear the following identification:

For Part A, **Bituminous Overlay & Road Furniture Works at Patratu Dam – Ramgarh Road (RPR-II) – Length 27.118 Kms and Chaibasa Kandra Chowka Road (CKC) - Length 68.700 Kms in the State of Jharkhand**

For Part B, **Microsurfacing Works at Patratu Dam – Ramgarh Road (RPR-II) – Length 27.118 Kms and Chaibasa Kandra Chowka Road (CKC) - Length 68.700 Kms in the State of Jharkhand**

DO NOT OPEN ON OR BEFORE 1500 Hrs IST 13th March, 2020

19.3 In addition to the identification required in Sub Clause 19.2, the outer & inner envelopes shall indicate the name and address of the Bidder to enable the Bid to be returned unopened in case it is declared late, pursuant to Clause 21.

19.4 If the outer envelope is not sealed and marked as above, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.

20. Deadline for Submission of the Bids

20.1 Completed Bids must be received by the Employer at the address specified above at Mumbai at or Ranchi Office(address in page 2 table) in hardcopy no later than **1100 Hrs IST on 06th March, 2020.** In the event of the specified date for the submission of Bids being declared a holiday for the Employer, the Bids will be received up to the appointed time on the next working day.

20.2 The Employer may extend the deadline for submission of Bids by issuing an amendment in accordance with Clause 10, in which case all rights and obligations of the Employer and the Bidders previously subject to the original deadline will then be subject to the new deadline.

21. Late Submission of Bids

21.1 Any Bid received by the Employer after the deadline prescribed in Clause 20 will be returned to the Bidder as unaccepted.

22. Modification and Withdrawal of Bids

22.1 Bidders may modify or withdraw their Bids by giving notice in writing before the deadline prescribed in Clause 20.

22.2 Each Bidder's modification or withdrawal notice shall be prepared, sealed, marked, and delivered in accordance with Clauses 18 and 19, with the outer and inner envelopes additionally marked "**MODIFICATION**" or "**WITHDRAWAL**", as appropriate.

22.3 No Bid may be modified after the deadline for submission of Bids.

22.4 Withdrawal or modification of a Bid between the deadline for submission of Bids and the expiration of the original period of Bid validity specified in Clause 15.1 or as extended pursuant to Clause 15.2 may result in the forfeiture of the Bid security pursuant to Clause 16.

22.5 Bidders may offer discount or modify the prices of their Bids only by submitting Bid modifications in accordance with this clause or included in the original Bid submission.

E: BID OPENING AND EVALUATION

23. Bid Opening

23.1 The Employer will open all Bids received (except those received late), including modifications made pursuant to Clause 22, in the presence of the Bidders or their representatives who choose to attend at the time, date and place specified in Clause 20. In the event of the specified date of Bid opening being declared a holiday for the Employer, the Bids will be opened at the appointed time and place on the next working day.

23.2 Envelopes marked "**WITHDRAWAL**" shall be opened and read out first. Bids for which an acceptable notice of withdrawal has been submitted pursuant to Clause 22 shall not be opened. Subsequently all envelopes marked "**MODIFICATION**" shall be opened and the submissions therein read out in appropriate detail.

23.3 The Employer will open the outer envelope of all the Bids received for the Overlay works (except those received late). Subsequently, **envelope** marked **(I)** containing **Bid security and qualification information** as per Sub Clause 12.1 (a) and (b) shall be opened for all the Bidders.

23.4 On confirming the Bid security, **envelope** marked **(II)** containing **the Form of Bid and priced Bill of Quantities** as per Sub Clause 12.1 (c) and (d) shall be opened for all the Bidders. The Bidder's names, the Bid prices, the total amount of the Bid, any discounts, Bid modifications and withdrawals, the presence or absence of Bid security, and such other details as the Employer may consider appropriate, will be announced by the Employer at the opening. Determination of the lowest Bidder shall be done after evaluation of the Bids as per terms of the Bid Document.

23.5 No bid shall be rejected at bid opening except for late bids pursuant to Clause 21 and conditional bids. Bids (and modifications) sent pursuant to Clause 22 that are not opened and read out at bid opening will not be considered for further evaluation regardless of the circumstances. Late and withdrawn bids will be returned un-opened to Bidders.

24. Process to be Confidential

24.1 Information relating to the examination, clarification, evaluation, and comparison of Bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process until the award to the Successful Bidder has been announced.

25. Clarification of Bids

25.1 To assist in the examination, evaluation, and comparison of Bids, the Employer may, at his discretion, ask any Bidder for clarification of his Bid, including breakdowns of all the unit rates. The request for clarification and the response shall be in writing or by email, but no change in the price or substance of the Bid shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids in accordance with Clause 27. In case any Bidder refuses to furnish any clarification sought by the Employer, which may affect his Bid Price, then his bid shall be liable to be treated as non-responsive.

25.2 Subject to Sub Clause 25.1, no Bidder shall contact the Employer/its representatives on any matter relating to the Bid from the time of the bid opening to the time the contract is awarded. If the Bidder wishes to bring additional information to the notice of the Employer, he shall do so in writing.

25.3 Any effort by the Bidder to influence the Employer in the Employer's bid evaluation, bid comparison or contract award decisions may result in the rejection of the Bidder's Bid.

26. Examination of Bids and Determination of Responsiveness

26.1 During the detailed evaluation of Bids, the Employer will determine whether each Bid (a) meets the eligibility criteria defined in Clauses 3 and 4, (b) has been properly signed; (c) is accompanied by the required securities, and (d) is substantially responsive to the requirements of the Bidding documents.

26.2 A substantially responsive Bid is one which conforms to all the terms, conditions, and specifications of the Bidding Documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality, or performance of the Works; (b) which limits in any substantial way, inconsistent with the Bidding Documents, the Employer's rights or the Bidder's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other Bidders presenting substantially responsive Bids.

26.3 If a Bid is not substantially responsive, it will be rejected by the Employer, and shall not subsequently be made responsive by correction or withdrawal of the non-conforming deviation or reservation.

26.4 The Bidder in no case can challenge the decision taken by Employer on the rejection of its Bid as Employer reserves sole right to accept or reject any Bid without any reason to be specified to Bidder. The Bid Guarantee submitted by Bidder shall be forfeited in cases where such efforts are made by Bidder.

27. Correction of Errors

27.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows:

(a) where there is a discrepancy between the rates in figures and in words, the rate in words will govern; and

(b) where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern.

(c) in case different rates are furnished in different sections of the Bill of Quantities for the same item, then the lowest rate for the item shall prevail for all the places where the item is appearing.

27.2 The amount stated in the Bid will be corrected by the Employer in accordance with the above procedure for the Correction of Errors and, with the concurrence of the Bidder. Such adjusted Bid Price shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected amount, the Bid will be rejected and the Bid Security may be forfeited in accordance with Sub Clause 16.6 (b).

28. Evaluation and Comparison of Bids

28.1 The Employer will evaluate and compare only the Bids determined to be substantially responsive in accordance with Clause 26.

28.2 In evaluating the Bids, the Employer will determine for each Bid the evaluated Bid Price by adjusting the Bid Price as follows:

(a) making any correction for errors pursuant to Clause 27; or

(b) making an appropriate adjustment for any other acceptable variations, deviations; and

(c) making appropriate adjustments to reflect discounts or other price modifications offered in accordance with Sub Clause 22.5.

28.3 The Employer reserves the right to accept or reject any variation, deviation, or alternative offer. Variations, deviations, and alternative offers and other factors which are in excess of the requirements of the Bidding documents or otherwise result in unsolicited benefits for the Employer shall not be taken into account in Bid evaluation.

28.4 Deleted

28.5 If the Bid of the successful Bidder is unbalanced in relation to the Employer's estimate of the cost of work to be performed under the Contract, the Employer may require the Bidder to produce detailed rate analysis for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those rates with the construction methods and schedule proposed. After evaluation of the rate analysis, the Employer may require that the amount of the performance security set forth in Clause 32 be increased at the expense of the successful Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the Successful Bidder under the Contract.

28.6 The Successful Bidder is bound to provide all necessary details as desired by The Employer in relation to commitment of Bidder with other projects, Manpower & Machinery utilization and all other details to be furnished by Bidder in order upto the satisfaction of Employer for undertaking said works,

F : AWARD OF CONTRACT

29. Award Criteria

29.1 Subject to Clause 30, the Employer will award the Contract to the Bidder whose Bid has been determined to be substantially responsive to the Bidding documents and who has offered the lowest evaluated Bid Price, provided that such Bidder has been determined to be (a) eligible in accordance with the provisions of Clause 3, and (b) qualified in accordance with the provisions of Clause 4.

30. Employer's Right to accept any Bid and to reject any or all Bids

30.1 Notwithstanding Clause 29, the Employer reserves the right to accept or reject any Bid, and to cancel the Bidding process and reject all Bids, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Employer's action.

31. Notification of Award and Signing of Agreement

31.1 The Bidder whose Bid has been accepted will be notified of the award by the Employer prior to expiration of the Bid validity period by email, telex or facsimile, and confirmed by letter. This letter (hereinafter and in the Conditions of Contract called the "Letter of Acceptance") (Form 7C of Section 7) will state the sum that the Employer will pay the Contractor in consideration of the execution, completion, and maintenance of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price").

31.2 The notification of award through the Letter of Acceptance will signify the intention of the Employer to enter into a contract, subject to the furnishing of a Performance Security by the Bidder in accordance with the provisions of Clause 32.

31.3 The Agreement (Form 7F of Section 7) will incorporate all clarifications sought and submitted, and all agreements between the Employer and the Successful Bidder. It will be signed by the Employer and kept ready in his office for signatures of the Successful Bidder within 21 days following the issue of the Letter of Acceptance.

31.4 The stamp duty and all applicable registration charges, taxes etc necessary for the execution of Contract agreement shall be borne by the Successful Bidder.

31.5 Upon furnishing of the Performance Security by the successful Bidder, the Employer will promptly notify the other Bidders that their Bids have been unsuccessful and refund their bid security.

32. Performance Security

32.1 Within 14 days of receipt of the Letter of Acceptance(LOA), the successful Bidder shall deliver to the Employer a Performance Security in the form of an unconditional Bank Guarantee for an amount equivalent to 5% of the Contract Price for Overlay works, in accordance with Clause 28.5 of ITB. The Bank Guarantee, in the prescribed format (Form 7B of Section 7), is acceptable from the following institutions located in India:

(a) State Bank of India or its subsidiaries;

(b) Any Indian Nationalized /Scheduled Bank;

(c) IDBI Bank or Axis Bank or ICICI Bank or HDFC Bank or Yes Bank; or

(d) Foreign Bank with operations in India provided the net worth in respect of the Indian operations shall not be less than Rs 500 crores as per the latest Annual Report of the Bank and that Bank Guarantee

The Performance Security for Overlay works shall be valid for 45 days beyond a period of 12 months after Bituminous Overlay Works or Microsufacing works Completion Date.

The Bidder has to submit separate Bank Guarantees for Part A & Part B works

32.2 Deleted

32.3 Failure of the successful Bidder to comply with the requirements of Sub Clause 32.1 shall constitute sufficient grounds for cancellation, cause for annulment of the award, forfeiture of the Bid Security and any such other remedy the Employer may take under the Contract, and the Employer may resort to awarding the Contract to any other evaluated Bidder.

33 Advance Payment

33.1 The Employer will provide an interest free Advance Payment on the Contract Price to the Contractor, as per Clause 47 of General Conditions of Contract (Section 3) subject to a maximum amount as stated in Contract Data.

34. Corrupt or Fraudulent Practices

34.1 The Employer requires that the Bidders/Contractors, observe the highest standard of ethics during the procurement and execution of the Contracts. In pursuance of this policy, the Employer:

(a) defines, for the purposes of this provision, the terms set forth below:

(i) "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of Employer/its representatives in the procurement process or in contract execution;

(ii) "fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Employer, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish Bid Prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition;

(iii) "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the procurement process or affect the execution of the Contract.

(b) will reject a proposal for award if the Employer determines that the Bidder recommended for award has engaged in corrupt, fraudulent or coercive practices in competing for the contract in question;

(c) will declare a firm ineligible, either indefinitely or for a stated period of time, if the Employer at any time determines that the firm has engaged in corrupt, fraudulent or coercive practices in competing for, or in executing, contracts.

Annexure – 1A

(Please refer Sub Clause 4.4 (a) of ITB)

Schedule of Minimum Key Construction Plant and Equipment required to be mobilized by Contractor for Overlay works for each package Minimum below for package RPR-II & CKC Overlay Works

Sr. No.	Type of Equipment	Min Plant & Equipment Nos. at each package of RPR-II & CKC
	For Type A- Bituminous Overlay & Road Furniture	
1	Batch Type Hot Mix plant (Minimum 120 Tons per Hr)	1
2	Sensor Paver finisher (9Mtr Width)	1
3	Generator (250 KVA)	1
4	Front End Loader (1 Cum bucket capacity)	1
5	Tipper (10 Ton Capacity)	7
6	Smooth Wheeled Tandem Roller	2
7	Air Compressor (250 cfm Capacity)	1
8	Emulsion Pressure Distributor (1750 sqm/hr)	1
9	Pneumatic Tyred Roller	1
10	Road Marking Machine 60 sqm/hr	1
11	Reflectometer for measuring the reflectivity of thermoplastic paint	1
	For Type B- Microsurfacing works	
1	Set of Micro Surfacing Machine along with all necessary machineries (fully mechanized with gauge showing all ingredients of mix at any time during the operation along with storage capacity for each constituent of micro surfacing layer and speed fixation arrangement for uniform laying)	1
2	Water Tanker	1
3	fully equipped Mobile laboratory for routine frequency test at site	1
4	Third party mix design proof check from NABL Accredited Laboratory before commencement of work	
5	Air Compressor As per requirement	1
6	Loader/JCB (Loading and Mixing)	1
7	Safety equipment for lane closure as per IRC specification for multiple locations and PPE for manpower.	2 Set
8	Utility Vehicle	1

Note: The Bidder must deploy the said plant & machinery for RPR-II & CKC package each separately. The Bidder should not utilize machinery of one package to another which shall affect the works. The bidder must produce the documentary evidence in support of his owning/leased/ rented of the above equipment. In case the bidder proposes to hire or take the above equipment on lease, he should, along with the lease/rent agreement, attach the proof of ownership of these equipment with the company/ entity from whom the equipment are proposed to be hired on lease/ rent.

Annexure – 1B
(Please refer Sub Clause 4.4 (a) of ITB)

DELETED

Annexure –1C
(Please refer Sub Clause 4.4 (b) of ITB)

Details of Minimum Key Personnel required to be mobilized by Contractor for Overlay works
Minimum below for package RPR-II & CKC Overlay Works

Part -A- Bituminous Overlay with Road Furniture

S No	Position	Minimum Qualification & Experience To be deployed at each package of RPR-II & CKC for Part A type of Works	Min Nos. at RPRII & CKC Package each
1	Project Manager	B.E. (Civil) with 8 years or Diploma civil with 10 years' experience	1
2	Highway Engineer	B.E. (Civil) with 5 years or Diploma civil with 7 years' experience	1
3	Planning Engineer/Quantity Surveyor	B.E. (Civil) with 3 years' experience	1
4	Quality Control Engineer	B.E. (Civil) with 5 years or Diploma civil with 7 years' experience	1

Part-B: Microsurfacing

S No	Position	Minimum Qualification & Experience To be deployed at each package of RPR-II & CKC for Part B type of Works	Min Nos. at RPRII & CKC Package each
1	Project Manager	B.E. (Civil) with 3 years or Diploma civil with 5 years' experience in Execution	1
2	Planning Engineer/ Quality Control Engineer	B.E. (Civil) with 3 years or Diploma civil with 5 years' experience in QA/QC	1
3	Site Supervisor	B.E. (Civil) with 3 years or Diploma civil with 5 years' experience in Execution	2

Note: The Bidder must deploy the said manpower for RPR-II & CKC package each separately. The Bidder should not utilize manpower of one package to another which shall affect the works. The bidder must produce the documentary evidence in support of educational/academic qualifications of candidates along with their work experience summary relevant to the said works. Bidder shall also attach updated curriculum vitae for all manpower do be deployed at project.

Annexure – 1D
(Please refer Sub Clause 4.4 (b) of ITB)

DELETED

SECTION 2:

QUALIFICATION INFORMATION AND OTHER FORMS

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Form 2B	Undertaking confirming evidence of access or availability of credit facilities	31
Form 2C	Letter from bidder to bankers authorizing them to provide information to IL&FS Transportation Networks Limited/Its Representatives	32

Form 2A
(On the Letterhead of Bidder)
(Please refer Clause 4 of ITB)

QUALIFICATION INFORMATION

The information to be filled in by the Bidder in the following pages will be used for purposes of the Qualification Information as mentioned in Clause 4 of the Instructions to Bidders. (Separate pages with required details shall be attached)

1. Details of Bidder

Name of Bidder/ Address/ Telephone/ Fax/ Email/ Contact Person and Designation

1.1 Constitution or legal status of Bidder
[Attach copy]

Place of registration: _____

Principal place of business: _____

Power of attorney in favor of signatory of Bid (Attach copy)

Constitution/Incorporation Documents such as Memorandum of Association, Article of Association, Partnership Deed etc (Attach Copy)

1.2 Availability of Contractor's Equipment should be listed below for carrying out the Works. Contractor is to fill the following items regarding the availability of Equipment. The minimum requirement is available at Clause 4.4 (a) of ITB.

Item of equipment	Minimum Requirement		Availability proposals				Remarks / Make
	No	Capacity	Nos	Capacity	Condition	Owned/ Leased/ to be procured	

1.3 Qualifications and experience of key personnel proposed for administration and execution of the Contract. Attach biographical data. Refer also to Sub Clauses 4.4 (b) of Instructions to Bidders and Sub Clause 9.1 of the General Conditions of Contract.

S No	Position	Name	Qualification	Years of experience (general)	Years of experience	
					In similar capacity	In similar nature of works (Roads)

1.4 Information on litigation history in which the Bidder is involved {Refer ITB Clause 4.2 (i)}-

Item Head	**Litigation 1**	**Litigation 2**
Name of Client		
Month/Year of origin		
Cause of Litigation/ Matter in Dispute		
Disputed Amount (Current Value in Indian Rupees)		
Resolved or pending resolution		
Award *For* or *Against*		
Actual Amount Awarded (Current Value in Indian Rupees)		
Other Claims Made, Settled/ Rejected		

1.5 Information regarding current litigation, debarring / expelling of bidder or abandonment of work by bidder; {(Refer ITB Clause 4.2 (i)}

1	(a)	Has the Bidder or its constituent partners a history of litigation/arbitration	Yes/No
	(b)	If yes, give details	
2	(a)	Has the Bidder or any of its constituent partners been debarred/expelled by any Agency in India, during the last 5 years as on the date of application	Yes/No
	(b)	If yes, give details	
3	(a)	Has the Bidder or any of its constituent partners abandoned any contract work in India during the last 5 years	Yes/No
	(b)	If yes, give details	
4	(a)	Has the Bidder or any of its constituent partners been declared bankrupt during the last 5 years	Yes/No
	(b)	If yes, give details, including present status	

Note: If any information in this schedule is found to be incorrect or concealed, at any time including after the award of Overlay Works, the Bidder's Bid will be treated as non-responsive, and action taken accordingly.

1.6 (A) Work performed as prime contractor/sub-contractor, work performed in the past as a nominated/approved sub- contractor provided further that all other qualification criteria are satisfied (in the same name) of a similar nature during the

Project Name	Name of the Employer*	Description of work	Contract No.	Quantity Executed Total/Year-wise(CuM for Type A/Sqm for Type B)	Value of Contract (Rs. Crore)	Date of issue of work order	Stipulated period of completion	Actual date of completion *	Remarks explaining reasons for delay

last 3 years.

Information on works in progress and works likely to be awarded.

(B) Current Commitments and Works in Progress

Sl No	Description of Work	Place & State	Name of the Employer	Contract No. and Date	Value of Contract (Rs Crores) @	Stipulated Period of Completion Date	Value of works completed (Rs Crores) @	Value of Works Remaining to be Completed (Rs Crores) @	Anticipated Completion Date	Role of Applicant* and Remarks
	TOTAL									

x

(C) Contracts for which Bids already submitted and are likely to be awarded

Sl No	Description of Work	Place & State	Name of the Employer	Estimated Value of Contract (Rs Crores) @	Stipulated Period of Completion	Date when Decision is expected	Role of Applicant* and Remarks
	TOTAL						

Note :

@ : In case of currencies other than Indian Rupees, please indicate the value of works in the original currency as well as Indian Rupees and also the exchange rate assumed.

* : Specify whether works were executed as Main Contractor, EPC Contractor, and Sub-Contractor or as JV Partner, along with their share.

1.6.1. Suitable certification from Employers to be necessarily attached as part of this Appendix.

1.7 Turnover for last 3 financial years

Sl No	Financial Year	Turnover in Rs Cr
1		
2		
3		

Suitable certification from Statutory Auditor/Chartered Accountant to be necessarily attached as part of this Appendix.

2. Deleted

Form 2B
(Refer Sub Cause 4.2 (e) of ITB, Section 1)

SAMPLE FORMAT FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF CREDIT FACILITIES

Deleted

Form 2C
(On the Letterhead of Bidder)
(Refer Sub Clause 4.2 (f) of ITB, Section 1)

SAMPLE FORMAT FROM BIDDER TO BANKERS AUTHORISING THEM TO PROVIDE INFORMATION TO IL&FS TRANSPORTATION NETWORKS LIMITED / ITS REPRESENTATIVES

To
Name of Bank/Address/City

Dear Sirs:

We have recently submitted a Bid to IL&FS Transportation Networks Limited for implementing the Works "**Overlay works at Patratu Dam – Ramgarh Road (RPR-II) – Length 27.118 Kms and Chaibasa Kandra Chowka Road (CKC) - Length 68.700 Kms in the State of Jharkhand**" We hereby authorize you to provide all information/data readily about us and our credit status, as may be required by IL&FS Transportation Networks Limited and you need not seek any clearance/opinion from us for providing the information/data to IL&FS Transportation Networks Limited and/or its authorized representatives.

Sincerely,

_____
Authorised Signatory

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SECTION : 3

PART – I : GENERAL CONDITIONS OF CONTRACT

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PART – I GENERAL CONDITIONS OF CONTRACT (GCC)

A : GENERAL

1. Definitions

1.1 Terms which are defined in the Contract Data are not defined in the Conditions of Contract but keep their defined meanings. Capital initials are used to identify defined terms.

Bill of Quantities means the priced and completed **Bill of Quantities** forming part of the Bid.

Compensation Events are those defined in Clause 41.

Contract Completion Date is the date of completion of Contractor's obligations under this Contract for the Construction works as indicated in the Contract Data.

Contract is the contract between the Employer and the Contractor to execute, complete and maintain the Works. It consists of the documents listed in Sub Clause 2.2.

Contract Data defines the documents and other information which comprise the Contract, more specifically refers to Section 4 of the Document.

Contractor is a person or firm, whose Bid to carry out the Works has been accepted by the Employer.

Contractor's Bid is the completed Bidding document submitted by the Contractor to the Employer.

Contract Price is the price stated in the Letter of Acceptance for Overlay works.

Days are calendar days; **months** are calendar months.

Defect is any part of the Works not completed in accordance with the Contract.

Defects Liability Period is the period specified in the Contract Data and calculated from the Overlay works Completion Date. For this particular contract, Defects Liability Period is 12 months after the Overlay works Completion Date.

Drawings include calculations and other information provided.

Employer is the party who will employ the Contractor to carry out the Works or its authorized representative.

Authorised representative is the person (or any other competent person appointed and notified to the Contractor to act in replacement of the Employer) who is responsible for supervising the execution of the Works and administering the Contract.

Equipment is the Contractor's machinery and vehicles' brought, temporarily or otherwise, to the Site to construct the Works.

Intervention Standards is the level of the damage at which road assets need to be intervened and repaired.

Letter of Acceptance means the formal acceptance by the Employer of the Bid.

Materials are all supplies, including consumables, used by the contractor for incorporation in the Works.

Milestone is a specified date or duration by which specified works are to be completed.

Permanent Works means the permanent works to be executed in accordance with the Contract.

Plant is any integral part of the Works which is to have a mechanical, electrical, electronic or chemical or biological function.

Project is a road/highway of Patratu Dam – Ramgarh Road (RPR-II) – Length 27.118 Kms and Chaibasa Kandra Chowka Road (CKC) - Length 68.700 Kms in the State of Jharkhand.

Rectification Standards is the period of time given to repair the damage to the road asset.

Overlay works Completion Date is the actual date of completion of Overlay works as certified by the Employer in accordance with Sub Clause 50.1.

Road Asset Group is clubbing of similar activities for road maintenance.

Service Quality specifies the condition of the road asset which gives a desirable level of service and comfort.

Site is the area defined as such in the Contract Data.

Specification means the Specifications of the Works included in the Contract and any modification or addition made or approved by the Employer, in writing.

Start Date is given in the Contract Data. It is the date when the Contractor shall commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.

Subcontractor is a person or firm or corporate body who has a contract with the Contractor to carry out a part of the work in the Contract.

Temporary Works are works designed, constructed, installed, and removed by the Contractor which are needed for construction or installation or maintenance of the Works.

Variation is an instruction given by the Employer in writing which varies the Works.

Works means the Overlay works as stated in the Contract Data.

Working Drawings means all Drawings, calculations, samples, patterns, models, maintenance manuals and other technical information of a like nature submitted by the Contractor and approved by the Employer, for execution of the Works.

2. Interpretation

2.1 In interpreting these Conditions of Contract, singular also means plural, male also means female or neuter, and the other way around. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Employer will provide instructions clarifying queries about the Contract.

2.2 The documents forming the Contract shall be interpreted in the following order of priority:

(1) Agreement (if completed)

(2) Letter of Acceptance

(3) Contractor's Bid

(4) Contract Data

(5) Conditions of Contract

(6) Specifications

(7) Priced Bill of Quantities; and

(8) Any other document forming part of the Contract.

3. Language and Law

3.1 The language of the Contract and the law governing the Contract are stated in the Contract Data.

4. Engineer's Duties and Employer

4.1 Deleted

4.2 Deleted.

4.3 Deleted

5. Delegation

5.1 Deleted.

6. Communication

6.1 Communication between parties of the Contract shall be effective only when it is in writing. A notice shall be effective only when it is delivered (in terms of Indian Contract Act).

7. Subcontracting

7.1 The Contractor may subcontract part of the Works with the approval of the Employer up to the extent mentioned in the Contract Sub Clause 4.2 (h) of ITB, Section 1 but may not assign the Contract without approval of the Employer in writing. Subcontracting does not alter the Contractor's obligations.

7.2 The Contractor shall not be required to obtain any consent from the Employer for:

(a) the subcontracting of any part of the Works for which the Sub-contractor is named in the Contract;

(b) the provision of labour; and

(c) the purchase of Materials which are in accordance with the standards specified in the Contract.

8. Other Contractors

8.1 The Contractor shall cooperate and share the Site with other Contractors, public authorities and the Employer and his representatives. The Contractor shall provide facilities and services for them related to the Work. The Employer may modify the Schedule of Other Contractors and shall notify the Contractor of any such modification.

9. Personnel

9.1 The Contractor shall employ the key personnel for the Overlay works, named in the Details of Key Personnel as referred to in the Contract Data to carry out the functions of the positions stated in Annexures–1C and 1D of the Instructions to Bidders, Section 1 or other personnel approved by the Employer. The Employer will approve any proposed replacement of key personnel only if their qualifications, abilities, and experience are relevant to the nature of duties.

9.2 If the Employer asks the Contractor to remove a person who is a member of the Contractor's staff or his work force stating the reasons, the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the work in the Contract.

10. Employer's and Contractor's Risks

10.1 The Employer carries the risks which this Contract states are Employer's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.

11. Employer's Risks

11.1 The Employer is responsible for the excepted risks which are in so far as they directly affect the execution of the Works in the Employer's country, the risks of war, hostilities, invasion, act of foreign enemies, rebellion, revolution, insurrection or military or usurped power, civil war, riot, commotion or disorder (unless restricted to the Contractor's employees), and contamination from any nuclear fuel or nuclear waste or radioactive toxic explosive.

12. Contractor's Risks

12.1 All risks of loss of or damage to physical property and of personal injury and death which arise during and in consequence of the performance of the Contract other than the excepted risks as at Sub Clause 11.1 are the responsibility of the Contractor.

13. Insurance

13.1 The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from any of the acceptable Insurance Companies in India, valid from the Start Date to the end of the Defects Liability cum Maintenance Period, including extended period, in the amounts and deductibles stated in the Contract Data.

13.2 Policies and certificates for insurance, from the acceptable Insurance Companies in India, shall be delivered by the Contractor to the Employer for the Employer's approval before the Start Date. All such insurance shall provide for compensation to be payable in Indian Rupees, along with the types and proportions required to rectify the loss or damage incurred.

13.3 If the Contractor does not provide any of the policies and certificates required, the Employer may effect the insurance which the Contractor should have provided and recover the premiums the Employer has paid, from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due and if warranted, recovered by invoking Performance Security.

13.4 Alterations to the terms of insurance shall not be made without the prior approval of the Employer, in writing.

13.5 The parties shall ensure that insurance is as per the applicable laws, and comply with all conditions of the insurance policies.

13.6 It shall be the responsibility of the Contractor to notify the insurance company of any change in the nature and extent of the Works and to ensure the adequacy of the insurance cover at all times during the period of the Contract or the extended period, if any.

14. Contractor to Construct the Works and Works to be completed by Contract Completion Date

14.1 The Contractor shall undertake the Works in accordance with the Contract as per instructions of the Employer.

14.2 The Contractor shall commence the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Contractor, as updated with the consent of the Employer, and complete them by the Contract Completion Date stated in the Contract Data.

14.3 Deleted.

14.4 Deleted.

15 Safety, Security and Protection of the Environment

15.1 The Contractor shall, throughout the execution and completion of the Works, the remedying of any defects therein and during Defect Liability period:

(a) have full regard for the safety of all persons entitled to be upon the Site and keep the Site so far as the same is under his control and the Works so far as the same are not completed or occupied by the Employer in an orderly state appropriate to the avoidance of danger to such persons;

(b) provide and maintain at his own cost all lights, guards, fencing, warning signs and watching, when and where necessary or required by the Employer or by any duly constituted Employer, for the protection of the public or others; and

(c) take all reasonable steps to protect the environment, on and off the Site, and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

The Contractor and his Subcontractors shall abide at all times by all existing enactments on environmental protection and rules made there under, regulations, notifications and bye-laws of the State or Central Government, or local authorities and any other law, bye-law, regulations that may be passed or notification that may be issued in this respect in future by the State or Central Government or the local Employer. Some of the major laws that are applicable are given below:

- The Water (Prevention and Control of Pollution) Act, 1974.
- The Air (Prevention and Control of Pollution) Act, 1981.
- The Environment (Protection) Act, 1986.
- The Public Liability Insurance Act, 1991.

16. Working Drawings

16.1 Deleted

16.2 The Contractor shall submit Designs, Specifications and Drawings to the Employer who will approve these, if they complied with the specifications & Drawings.

17. Approval by the Employer

17.1 The Employer shall approve the Designs, Specifications and Drawings submitted by the Contractor

17.2 The Contractor shall obtain approval of other relevant authorities/agencies (if any like Railways Department etc.) for carrying out Works, where required.

17.3 The Employer's approval shall not relieve the Contractor of his obligations.

18. Safety of Traffic

18.1 The Contractor shall be responsible for the safety of all activities on the Site.

19. Discoveries

19.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be property of the Employer. The Contractor shall notify the Employer of such discoveries and carry out the Employer's instructions for dealing with them.

20. Possession of the Site

20.1 The Employer shall give possession of the Site to the Contractor in accordance with the Contract Data. If possession of minimum 75% of the site is not given by the agreed date stated in the Contract Data, then the Overlay works Completion Date shall be postponed by the Employer as may be required for that particular part/stretch. However, this will not be applicable if sufficient work site is made available to the Contractor as and when required, for him to proceed ahead with progress of work and if available work fronts remain unattached/unutilized.

21. Access to the Site

21.1 The Contractor shall allow the Employer and any person authorized by them access to the Site, to any place where work in connection with the Contract is being carried out or is intended to be carried out and to any place where materials or plant are being manufactured / fabricated / assembled /stored for the Works.

21.2 Commencement of the Project

The Contractor shall commence the Works on Site within the period stated in the Contract Data after receipt by him of a Notice to this effect from the Employer, to be issued within 30 days after signing of the Agreement. Thereafter, the Contractor shall proceed with the Works with due expedition and without delay.

The requirement to commence the Works at Site shall be fulfilled if:

(a) A programme has been submitted in accordance with Clause 25 of Conditions of Contract;

(b) The Contractor's authorized representative, with full supporting staff are in position at the Site;

(c) Equipment, Plant, materials and labour for the work programmed for execution in the first two months have been mobilized at the Site.

22. Instructions

22.1 The Contractor shall carry out all instructions of the Employer pertaining to the Works, which comply with the applicable laws where the Site is located.

23. Disputes

23.1 If either party believes that a decision taken by the Employer/Contractor was either outside the Contract or that the decision was wrongly taken, the objecting party may file notice of dispute to the other party stating that it is giving the notice pursuant to this Clause while stating clearly the basis for the dispute within 21 days of the notification of the decision.

23.2 The party receiving the dispute notice will consider it and reply in writing within 28 days of the receipt of the notice. If no reply is received or the reply is not acceptable to the other party, the affected party may refer the dispute for Arbitration to the Arbitral Tribunal.

24. Procedure for Disputes – Arbitration

24.1 The arbitration shall be conducted in accordance with the arbitration procedure stated in Clause 7 of the Special Conditions of Contract.

B: TIME CONTROL

25. Program

25.1 Within the time stated in the Contract Data, the Contractor shall submit to the Employer for consent, an updated Program for the awarded Works including Quality Control, Environment and Traffic Management Plans showing the general methods, arrangements, order, and timing for all the activities in the Works along with monthly cash flow forecast (Annexure 3A & 3B).

25.2 An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work including any changes to the sequence of the activities.

25.3 If the Contractor does not submit an updated Program within this period as specified in the Contract Data, the Employer may withhold the amount stated in the Contract Data from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted. An updated Program is to show the effect of Variations and Compensation Events.

25.4 The Employer's consent of the Program shall not relieve the Contractor of his obligations.

26. Extension of the Overlay works Completion Date

26.1 The Employer shall extend the Overlay works Completion Date as stated in the Contract Data, if a Compensation Event occurs or a Variation is issued which makes it impossible for completion to be achieved by the Overlay works Completion Date, without the Contractor taking steps to accelerate the remaining work and which would cause the Contractor to incur additional cost.

26.2 The Employer shall decide whether and by how much to extend the Overlay works Completion Date, within 28 days of the Contractor asking the Employer for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Overlay works Completion Date.

26.3 Deleted.

26.4 Employer is fully empowered to grant extension to the Overlay works Completion Date.

27. Delays Ordered by the Employer

27.1 The Employer may instruct the Contractor to delay the start or progress of any activity within the Works.

27.2 Deleted.

28 Management Meetings

28.1 Either the Employer or the Contractor may require the other to attend a management meeting/site visit. The business of a management meeting shall be to review the progress of work plans for remaining work and to deal with matters raised in accordance with the early warning procedure.

28.2 The Employer shall record the business of management meetings and shall provide copies of his record to those attending the meeting. The responsibility of the parties for actions to be taken is to be decided by the Employer either at the management meeting or after the management meeting and stated in writing to all those who attended the meeting. Failure to attend the management meetings/site visits shall attract penalties at the rate indicated in the Contract Data and in case of non-attendance of more than three such meetings/visits by the Contractor, then the same shall be construed as fundamental breach of the Contract in terms of Clause 54.

28.3 Maintenance Works Program and Review Meetings

(a) Deleted.

(b) Deleted

28.4 Monthly progress reports shall be prepared by the Contractor and submitted to the Employer in six hard copies and one soft copy. The first report shall cover the period upto the end of the first calendar month following the Start Date. Reports shall be submitted within 7 days for each month thereafter.

Each report shall include:

(i) status of availability of site and problems related thereto, if any,

(ii) status of mobilization and working of equipment & machinery,

(iii) details of progress of work with charts and photographs,

(iv) comparison of actual and planned progress, with details of any events or circumstances which may jeopardize the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome delays,

(v) status of procurement of material required for the work,

(vi) production of various materials at site such as aggregate, reinforced earth panels etc.,

(vii) list of Variations, notices given etc.,

(viii) construction problems encountered, if any,

(ix) copies of quality control documents, tests results and certificate of materials,

(x) safety statistics, including details of any hazardous incidents and activities, related to environmental aspects and public relations,

(xi) weather record during the month, day by day, and

(xii) any other details/matters related to the Work.

29. Early Warning

29.1 The Contractor is to warn the Employer at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the Work, increase the Contract Price or delay the execution of the Works. The Employer may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Contract Completion Date. The estimate is to be provided by the Contractor as soon as reasonably possible.

29.2 The Contractor shall cooperate with the Employer in making and considering proposals as to how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Employer.

C: QUALITY CONTROL

30. Identifying Defects

30.1 The Employer shall check the Contractor's work and notify the Contractor of any Defects that are found. The Employer may instruct the Contractor to search for a Defect and to uncover and test any work that the Employer considers may have a Defect. Such checking/instructions shall not absolve the Contractor of his responsibilities.

30.2 The Contractor shall permit the Site visits of the Employer's Technical Auditor/Independent Engineer/Lenders' Engineer to check the Contractor's work and notify the Employer and the Contractor of any Defects that are found. Such a check shall not absolve the Contractor's or the Employer's responsibility as defined in the Contract.

31. Tests

31.1 The Contractor shall be responsible for carrying out the tests prescribed for the Works.

31.2 The Contractor shall, at his cost, establish suitable testing facility with adequate and suitable equipment and survey equipment in the vicinity of the work Site premises, as prescribed in the Specifications, to the satisfaction of the Employer.

31.3 If the Employer instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a defect and the test shows that it does, the Contractor shall pay for the test and sample. If it shows that the work is not defective, then the Employer shall pay for the test and samples.

31.4 The Contractor shall furnish all test results as per the approved Quality Control Plan to the Employer, in a monthly progress report as per Sub Clause 28.4 or at a frequency directed by the Employer. The Employer may withhold payment for those works where test results have not been submitted.

32. Correction of Defects

32.1 The Contractor shall undertake measures to rectify the defects in the Work identified by the Employer or any of the Employer's authorized representative at the earliest, but not later than the time period specified by the Employer.

32.2 The Defect Liability Period shall be as given in the Contract Data. The Employer shall give notice to the Contractor of any defects before the end of the Defects Liability Period. The Defects Liability Period shall be extended for as long as defects remain to be corrected.

33. Uncorrected Defects

33.1 If the Contractor has not corrected a defect to the satisfaction of the Employer, within the time specified in the Employer's notice, the Employer will assess the cost of having the defect corrected, and the Contractor will pay this amount. In case of failure to pay, the same shall be deducted from any payment due to the Contractor/recovered from his Bank Guarantees under intimation to the Contractor.

D : COST CONTROL

34. Bill of Quantities

34.1 The Bill of Quantities shall contain items for the Overlay works for construction, installation, testing and commissioning works to be executed by the Contractor.

34.2 The Bill of Quantities shall be the basis to calculate the payment for Overlay works. The Contractor is paid for the quantity of the work done at the rate in the Bill of Quantities for each item.

34.3 Deleted

35. Changes in the Quantities

35.1 Deleted

35.2 The change in quantities/amounts due to increase/decrease in the scope of work, that is, Variation in Bill and in the Bill of Quantities, Section 6 of the Bid Document (Volume 2) shall be considered for additional payment as per rates defined in Bill of Quantities.

35.3 If requested by the Employer, the Contractor shall provide the Employer with a detailed cost breakdown of rate of any item in the Bill of Quantities.

35.4 IL&FS Transportation Networks Limited is fully empowered to approve the variation of quantity and rates for extra item on the merit of the case.

36. Variations

36.1 Item rates quoted for each BOQ item shall remain fixed irrespective of any Quantity Variation.

36.2 All Variations during implementation of the Overlay works, shall be included in updated Programs produced by the Contractor.

36.3 Deleted

37. Payments for Variations

37.1 The %age of bitumen in any of the courses shall be as per the approved Job Mix formula and no variation shall be paid against the same.

37.2 If the event of variation is in terms of additional/extra item(s) or substitution of any item(s) in the BOQ with new item(s), then the rates for the items shall be decided on mutual consent.

(a) Deleted

(i) Deleted

(ii) Deleted

(iii) Deleted

(iv) Deleted

(v) Deleted

38. Cash Flow Forecasts

38.1 When the Program is updated, the Contractor shall provide the Employer with an updated cash flow forecast.

39. Payment Certificates

39.1 Overlay works

(a) The Contractor is required to measure the work under the observation and control of the Employer. The Contractor shall submit to the Employer monthly statements of the estimated value of the work executed, less the cumulative amount certified previously and, applicable statutory deductions, outstanding advances supported with detailed measurements of the items of work executed, approved request for inspections (RFI) for the work done during the month, applicable rates and other relevant details, both in hard and soft form (in a Compact Disk of size acceptable to the Employer) along with an abstract statement, in accordance with the provisions of this Contract.

(b) The Employer shall ascertain and determine by measurement the value of the work in accordance with the Contract. The Employer shall exclude any item in a previous certificate or reduce the proportion of any item previously certified in the light of later information.

(c) The value of work executed shall comprise the value of quantities of the items in the Bill of Quantities.

(d) The value of work executed shall include the valuation of Variations.

(e) Items of the Works for which no rate or price has been provided in the priced BOQ will not be paid for by the Employer and shall deemed to be covered by other rates and prices in the Contract.

(f) The certification and payment methodology for Overlay works shall be as given below:

(i) Contractor to submit a payment request with details of Works completed or partly completed during the calendar month to the Employer, within seven days from the last date of the particular month;

(ii) Within Seven days of receipt of Contractor's RA Bill, Employer is required to evaluate the payment request in terms of the work executed, and if the Employer finds the payment request in order, he certifies to pay 70% of eligible payment against the RA Bill, subject to availability of funds. This payment shall be net of recovery of mobilization and other advances, recovery in terms of Contract and Taxes to be deducted at source as applicable under the Law.

(iii) Subsequent to submission of monthly payment request, Employer shall check the Contractor's monthly statement within 10 days and certify the amount to be paid to the Contractor after taking into account the recovery of advance payments, as per para (ii). Employer shall also account for Liquidated Damages and other deductions, Variation in price of bitumen, while arriving at the amount payable to the Contractor.

(iv) Employer shall make payments within thirty days for final certified bills to the contractor.

39.2 Deleted

40. Delayed and Disputed Payments

40.1 Deleted

41. Compensation Events

41.1 Deleted

42. Tax

42.1 The rates quoted by the Contractor shall be deemed to be inclusive of GST and all other applicable taxes including duties/royalties/levies as may be levied by Central/State Governments and local bodies that the Contractor will have to pay for the performance of this Contract. The Employer will perform such duties in regard to the deduction of such taxes at source as per applicable law on the date of payment of the Contractor's bill.

43. Currencies

43.1 All payments shall be made in Indian Rupees only.

44. Changes in Cost and Legislation

44.1 Price Adjustment

Deleted

44.2 **Other Changes in Cost**

Deleted

44.4 **Adjustment Formulae**

Deleted

44.5 Base, Current and Provisional Indices

Deleted

44.6 Limit of Price Adjustment

(a) Deleted.

44.7 Subsequent Legislation

If, after the last date for submission of tenders for the Contract, there occur changes to any National or State Statute, Ordinance, Decree or other Law or any regulation or bye-law of any local or other duly constituted Employer, or the introduction of any such State Statute, Ordinance, Decree, Law, regulation or bye-law which causes additional or reduced cost to the Contractor, other than under the preceding Sub-Clauses of this Clause, in the execution of the Contract, such additional or reduced cost shall, after due consultation with the Employer shall be added to or deducted from the Contract Price and the Employer shall notify the Contractor accordingly.

45. Liquidated Damages and Penalty

45.1 <u>For Overlay works</u>

Penalty shall be applicable @ Rs. 2.00 (Two) Lac/day of delay for non- completion of the work within stipulated completion time. Maximum cumulative (total) penalty shall be applicable @5% of the Contract Price.

46. Deleted

47. Advance Payment

47.1 The Employer shall, make interest free advance payment to the Contractor, on his request, of the amounts and by the date stated in the Contract Data, against provision by the Contractor of an unconditional Bank Guarantee for an amount equal to the advance payment. The Bank Guarantee, in the prescribed format is acceptable from the following institutions located in India:

(a) State Bank of India or its subsidiaries;

(b) Any Indian Nationalized /Scheduled Bank;

(c) IDBI Bank or Axis Bank or ICICI Bank or HDFC Bank or Yes Bank; or

(d) Foreign Bank with operations in India provided the net worth in respect of the Indian operations shall not be less than Rs 500 crores as per the latest Annual Report of the Bank and that Bank Guarantee is issued by a branch in India.

The guarantee shall remain effective until the advance payment has been fully recovered, but the amount of the guarantee can be progressively reduced by the amounts repaid by the Contractor.

47.2 The Contractor is to use the advance payment only to pay for Equipment, Plant and Mobilization expenses required specifically for execution of the Works. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Employer.

47.3 The advance payment shall be recovered by deducting proportionate amounts as indicated in the Contract Data, from payments otherwise due to the Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the Mobilization & Equipment/Plant advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, or liquidated damages.

47.4 Deleted

48. Securities

Deleted

49. Cost of Maintenance

49.1 Loss or damage to or defective works or materials during the execution of Works shall be remedied by the Contractor at the Contractor's cost to the satisfaction of the Employer.

E : FINISHING THE CONTRACT

50. Completion

50.1 The Contractor shall request the Employer to issue a certificate of completion of Overlay works and the Employer shall do so upon deciding that the Overlay Work is completed.

50.2 No later than 30 days prior to the Contract Completion Date, the Contractor and the Employer shall conduct a condition survey of all the items mentioned in the Road Asset Groups and the items not confirming to the specified Intervention Standard shall be recorded.

Where items not meeting the specified Interventions Standard are identified, the Employer shall:

(a) provide a written record of the condition survey to the Contractor within 14 days of the completion of the survey. The Employer's decision on the condition of any item of Road Asset Group shall be final.

(b) direct the Contractor to rectify the deficiencies within the specified Rectification Standard / Period.

50.3 On satisfactory completion of Defect Liability Period, the Contractor shall request the Employer to issue a Certificate of Completion of the Contract. The Employer shall, issue such certificate subject to the Contractor satisfying all provisions under the Contract.

51. Taking Over

51.1 Deleted.

52. Final Account

52.1 In case of Overlay works, the Contractor shall supply to the Employer a detailed account of the total amount that the Contractor considers payable under the Contract within 60 days after the issue of certificate of completion of Overlay works by the Employer as per Sub Clause 50.1. The Employer shall certify any final payment that is due to the Contractor within 60 days of receiving the Contractor's account. If the Employer is not satisfied with the detailed account, then the Employer shall issue within 30 days thereto a schedule that states the scope of the corrections or additions that are necessary. If the Contractor fails to comply with the Employer's instructions within 15 days, Employer will certify as per the schedule of Corrections or addition sent to contractor and make payment to the Contractor within 45 days.

52.2 The Contractor shall submit his Final Statement of Account within 45 days of the Contract Completion Date and the Employer shall certify within 45 days and submit to the Employer any final payment that is due to the Contractor. Thereafter, the Employer shall make payment to the Contractor within 30 days. If the Employer is not satisfied with the detailed account, then the Employer shall

issue within 30 days, thereto, a schedule that states the scope of the corrections or additions that are necessary. If the revised final account is still unsatisfactory after it has been resubmitted, the Employer shall decide on the amount payable to the Contractor and issue a payment certificate within 30 days of receiving the Contractor's revised final account.

53. As Built Drawings and Maintenance Manuals

53.1 Deleted

54. Termination

54.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.

54.2 Fundamental breach of the Contract includes, but shall not be limited to the following:

(a) the Contractor stops work for 28 days when no stoppage of work is shown on the current program and the stoppage has not been authorized by the Employer;

(b) the Employer or the Contractor is made bankrupt or goes into liquidation, other than for purposes of reconstruction or amalgamation;

(c) a payment for certified bills is not paid by the Employer to the Contractor within 60 days of the date of the Employer's certificate;

(d) the Employer gives notice that failure to correct a particular Defect is a fundamental breach of the Contract and the Contractor fails to correct it within a reasonable period of time determined by the Employer;

(e) the Contractor does not maintain Performance Security which is required;

(f) the Contractor has defaulted in fulfilling his obligations under this Contract;

(g) the Contractor has contravened Sub-Clause 9.2;

(h) the Contractor does not adhere to the agreed construction program as per Clause 25 and also fails to attend the management meetings (Clause 28);

(i) the Contractor fails to carry out instructions of the Employer within a reasonable time determined by the Employer in accordance with the Sub Clauses 15.1, 22.1and 45.1;

(j) the Contractor has delayed the completion of the Works beyond the period for which the maximum amount of liquidated damages has become payable as defined in the Contract Data;

(k) if the Contractor, in the judgment of the Employer has engaged in corrupt, fraudulent or coercive practices as defined in Sub Clause 34.1 (a) of ITB in competing for or in executing the Contract;

(l) Deleted

54.3 When either party to the Contract gives notice of a breach of contract to the Employer for a cause other than those listed under Sub Clause 54.2, the Employer shall decide whether the breach is fundamental or not.

54.4 Notwithstanding the above, the Employer may terminate the Contract for convenience.

54.5 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure and leave the Site as soon as reasonably possible.

55. Payment upon Termination

55.1 If the Contract is terminated because of a fundamental breach of the Contract by the Contractor, the Employer shall issue a certificate for the value of the work done less advance payments made up to the date of the issue of the certificate, less other recoveries due in terms of the Contract, less taxes due to be deducted at source as per applicable law and less the percentage to apply to the work not completed as indicated in the Contract Data. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer. For this purpose, the performance security furnished by the Contractor shall not be taken into account. The Performance Security furnished by the Contractor shall stand forfeited in favor of the Employer without any restrictions or preconditions.

55.2 If the Contract is terminated at the Employer's convenience or because of a fundamental breach of the Contract by the Employer, the Employer shall issue a certificate for the value of the work done, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works and less advance payments received up to the date of the certificate, less other recoveries due in terms of the Contract and less taxes due to be deducted at source as per applicable law and the Employer shall pay.

56. Property

56.1 If the Contract is terminated because of Contractor’s default, all materials on the Site, Plant, Equipment, Temporary works and the Works are deemed to be the property of the Employer, till completion of the work. The Employer shall make use of the available materials and equipment for completion of the Work.

57. Release from Performance

57.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Contractor, the Employer shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all Works carried out before receiving the certificate and for any work carried out afterwards to which commitment was made.

58. Details to be Confidential

58.1 The Contractor shall treat the details of the Contract as private and confidential and shall not publish or disclose the same or any particulars thereof in any trade or technical paper or elsewhere without the previous consent in writing of the Employer. If any dispute arises causing the necessity of any publication or disclosure for the purpose of the Contract, the same shall be referred to the Employer whose determination shall be final.

59. Life-saving Appliances and First-aid Equipment

59.1 The Contractor shall provide and maintain upon the Works and the Site, sufficient, proper and efficient life-saving appliances and first-aid equipment, to the satisfaction of the Employer. The appliances and equipment shall be available for use at all times during the pendency of the Contract.

PART – II SPECIAL CONDITIONS OF THE CONTRACT (SCC)

A : GENERAL

1 Labour

1.1 The Contractor shall, unless otherwise provided in the Contract, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport.

1.2 The Contractor shall, if required by the Employer, deliver to the Employer a return in detail, in such form and at such intervals as the Employer may prescribe, showing the staff and the numbers of the different classes of labour from time to time employed by the Contractor on the Site and such other information as the Employer may require.

1.3 During continuance of the Contract, the Contractor and his Sub-Contractors shall abide at all times by all existing labour enactments and rules made thereunder, regulations, notifications and bye laws of the State or Central Government or local Employer and any other labour law (including rules) that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or any competent Employer.

1.4 The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent Authority on account of contravention of any of the provisions of any Act or rules made thereunder, regulations or notifications including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/bye laws/Acts/ Rules/regulations including amendments, if any, on the part of the Contractor, the Employer shall have the right to deduct any money due to the Contractor including his amount of performance security. The Employer shall also have the right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

1.5 The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Employer at any point of time.

2 Statutory Clearances

2.1 List of clearances to be obtained by the Employer and the Contractor are given below. It may be noted that the list below may not be exhaustive and in case any additional clearances are required, the same shall be procured by the Contractor, unless otherwise specified in the Law / guidelines of statutory agencies.

(a) Employer's Responsibility:

(i) Environmental clearance for the project, if any;

(ii) Permission for shifting of utilities;

(iii) Permission for cutting trees;

(iv) Land acquisition;

(b) Contractor's Responsibility:

(i) Pollution Control Board and other Statutory Clearances for hot mix plant, stone crushers and any other purpose / activity as may be required;

(ii) Excavation, cutting, transporting and dumping of earth and other construction materials including that for quarry;

(iii) All police and traffic management related clearances at the work sites;

(iv) Employing labour and other labour related clearances (ESI / Contract Labour / Health / PF etc.);

(v) Electrical connections and Water Supply;

(vi) Employment of migrant labour;

(vii) Establishing and operating labour camps;

(viii) Location of fuel storage tanks / containers etc.;

(ix) Clearances for using / storing explosives;

(x) All clearances required from the Fire Department; and

(xi) Any other clearances that are not specifically included in Employer's list and may be required according to prudent utility practices or instructed by Employer.

3 Revision of Quality Control Plan

3.1 The Employer shall instruct the Contractor to revise and/or resubmit his Quality Control Plan, if required before giving approval. The Contractor shall implement any required changes to improve the Quality Control Plan. The approval of the Employer shall not absolve the Contractor of his responsibilities and obligations under the Contract.

4 Measuring / Monitoring Equipment

4.1 The Contractor shall ensure properly calibrated and functional measuring/ monitoring equipment, to the satisfaction of the Employer, at all times during the Contract.

5 Private Roadside Structures

5.1 Deleted

6 Private Entrances

6.1 Deleted

7 Arbitration (Refer GCC Sub Clause 24.1)

7.1 The procedure for arbitration shall be as follows:

(a) In case of Dispute or difference arising between the Employer and the Contractor relating to any matter arising out of or connected with this agreement referred for arbitration, shall be settled in accordance with the Arbitration and Conciliation Act, 1996.

(b) The Arbitral Tribunal shall consist of three Arbitrators, one each to be appointed by the Employer and the Contractor. The third Arbitrator shall be chosen by consensus by the two Arbitrators so appointed by the Parties and shall act as the Presiding Arbitrator. In case of failure of the two Arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the Arbitrators, then the Presiding Arbitrator shall be appointed by the Indian Roads Congress on the request of the Employer.

(c) If one of the parties fails to appoint its Arbitrator in pursuance of Sub Clauses (a) and (b) within 30 days after receipt of the notice of the appointment of its Arbitrator by the other party, then the Indian Roads Congress shall appoint the Arbitrator on the request of the Employer. In case the Employer fails to do so within 30 days, the Contractor will approach the Indian Roads Congress for appointment of Arbitrator. A certified copy of the order of the Indian Roads Congress, making such an appointment shall be furnished to each of the parties.

(d) Arbitration proceedings shall be held at Mumbai and the language of the arbitration proceedings and that of all documents and communications between the parties shall be English.

(e) The decision of the majority of Arbitrators shall be final and binding upon both parties. The cost and expenses of Arbitration proceedings will be paid as determined by the Arbitral Tribunal and shared equally by both the parties.

(f) Performance under the Contract shall continue during the arbitration proceedings and payments due to the Contractor by the Employer shall not be withheld, unless they are the subject matter of the arbitration proceedings.

B : MAINTENANCE MANAGEMENT SYSTEM

8 Deleted

9 Deleted

C : GENERAL MAINTENANCE REQUIREMENTS

10 Maintenance Survey

Deleted

11 Management of Spoil and Excess Road Making Material
Deleted

12 Underground Sewer Pipelines

Deleted

D : EVALUATION OF SERVICE QUALITY LEVELS FOR PAYMENT OF MONTHLY CERTIFICATE FOR MAINTENANCE WORKS

13 Deleted

14 Compliance by Contractor

Deleted

Annexure – 3A

(Sub Clause 4.2 (k) of Section 1 and 25.1 of Section 3, GCC)

CONTRACTOR'S WORKS PROGRAM AND CASH FLOW FORECAST

Contractor shall cover the following:

1. Program of construction, backed with equipment planning and deployment, duly supported with broad calculations as per Site handing over.

2. Critical Path Method and Schedule and/PERT or bar chart, with resource allocations based on Contractor's work program.

3. Quality assurance procedures proposed to be adopted.

4. A concise method statement in narrative form covering each major activity:
   (a) Traffic control
   (b) Tack Coat
   (c) Bituminous concrete
   (d) Miscellaneous items

5. Details of Contractor's schedule of site takeover

The Contractor shall include additional INFORMATION necessary to complement and accurately describe the proposed work program and possession of site schedule.

Annexure – 3B

(Sub Clause 4.2 (k) of Section 1, Sub Clause 25.1 and Clause 38 of Section 3, GCC)

MONTHLY CASH FLOW FORECAST

Period from Commencement of Works (Months)	Contractor's Estimate			
	% of Work	Amount	Cumulative	Aggregate Amount

SECTION 4:

CONTRACT DATA

CONTRACT DATA

S. No.	Item	Clause Reference of CC
1	The Employer is : IL&FS Transportation Networks Limited(ITNL) The IL&FS Financial Center, Plot C-22, G Block, Bandra Kurla Complex, Mumbai- 400051 Tel.: +91 022-26533333, Facsimile: +91 022-26523979 E-mail: itnl.projectbids@itnlindia.com Website: www.itnlindia.com Contact Person- Mr. RaviKumar Praveen	1.1 GCC
2	The Engineer is Project Manager, ITNL	1.1 GCC
3	The project work is **Bituminous Overlay Works at Patratu Dam – Ramgarh Road (RPR-II) – Length 27.118 Kms and Chaibasa Kandra Chowka Road (CKC) - Length 68.700 Kms in the State of Jharkhand**	1.1 GCC
4	The Works consists of Overlay works & other items as per Bill of Quantities	1.1 ITB
5	The Start Date shall be within 30 days from the date of signing of the Contract agreement for the works	1.1 and 21.2 GCC
6	The language of the Contract documents is English	3 GCC
7	The law which applies to the Contract is the laws of Union of India	3 GCC
8	The following documents are also part of the Contract in addition to documents mentioned in Sub Clause 2.2 of GCC: Details of Minimum Key Personnel required to be mobilized by Contractor for Improvement and Maintenance Works (as per Annexures–1C and 1D of Section 1) Schedule of Minimum Key Plant and Equipment to be deployed by Contractor on the work as per Program of Construction and Maintenance (as per Annexures–1A and 1B of Section 1)	9 GCC 4 ITB
9	Insurance requirements are as under: **S. No.** — **Description of Cause** — **Minimum Cover of Insurance** During Overlay works (i) Workmen Compensation for Contractor's Own Workers — In accordance with statutory requirements, applicable in India. (ii) Contractor's own Machinery Equipment/Plant and Materials- Loss or damage including earthquake, terrorism, storm, tempest, flood, inundation cover & defect liability cover. — Sum sufficient to provide replacement at site (iii) Against liabilities for death or injury to any person or loss of or damage — In accordance with statutory requirements, applicable in	13 GCC

	to any third-party property — India. (iv) Any other insurance cover — In accordance with statutory requirements, applicable in India.	
10	Contract Completion Date for: (a) Overlay works: - 6 months from the Start Date of the Works. (b) Defect Liability Period: - 12 months after Overlay works Completion Date.	14 GCC
11	The Site Possession shall be given within one month from date of start	20 GCC
12	The period between Program Updates shall be 30 days	25 GCC
13	The amount to be with-held for late submission of an updated Program shall be Rs 50,000/- each time	25 GCC
14	Penalty for not attending Management Meetings/ Site visits including Weekly Meetings: Rs 5000/- per incidence	28 GCC
15	The following are Compensation Events unless they are caused by the Contractor: (a) Deleted	41 GCC
16	Penalty and Liquidated Damages:	45 GCC

S. No.	Particulars	Penalty / Liquidated Damages	Limit
1	Delay of work	Penalty shall be applicable @ Rs. 2.00 Lac/day of delay for non-completion of the work within stipulated completion time	Maximum cumulative (total) penalty 5% of the Contract Price.

17	Deleted	46 GCC
18	(i) Interest free advance payments payable for the Overlay works are as below:	47 GCC

S. No.	Nature of Advance	Amount in Rs.	Conditions to be fulfilled
1.	Mobilization*	10% of the Contract Price for Overlay works.	After submission of un-conditional Bank Guarantee for 10% of Contract Price and, thereafter, obtaining confirmation of the Bank Guarantee from the issuing Bank. Same shall be valid up to 45 days beyond the period of stipulated Contract completion date or shall be defined in contract whichever will be later.

	Form 7H in Section 7 of the Bidding Documents.	
19	The Performance Security shall be for the following minimum amounts equivalent as a percentage of the Contract Price for Overlay works: Performance Security of 5% of Contract Price plus Rs. ..... as additional security for unbalanced items of unbalanced bids valid for 45 days beyond 12 months after Overlay works Completion Date. The standard form of Performance Security acceptable to the Employer shall be an unconditional Bank Guarantee of the type as presented in Form 7D in Section 7 of the Bidding Documents.	32 GCC
20	The Defects Liability Period cum Maintenance Works Period is 12 months after the Overlay works Completion Date.	32 GCC
21	Deleted	53 GCC
22	Deleted	55.1 GCC
23	Deleted	125 of STS
24	Deleted	126 of STS

SECTION 5 : SPECIFICATIONS

Part No	Description	Page no
	Preamble	70
Part I	General Technical Specifications	71
Part II	Supplementary Technical Specifications	71-93

SECTION : 5

SPECIFICATIONS

1. Preamble

1.1 The Specifications contained herein shall be read in conjunction with the other Bidding Documents as specified in Section 1.

1.2 Wherever reference is made in the Contract to specific standards/codes to be met by the materials, plant, and other supplies to be furnished, and work performed or tested, the provisions of the latest current edition or revision of the relevant standards and codes shall apply, unless otherwise expressly stated in the Contract. Where such standards and codes are national, or relate to a particular country of region, other internationally recognized standards and codes specified will be accepted subject to the Employer's prior review and written approval.

2. General Requirement

The Specifications in accordance with which the entire work shall be constructed and maintained by the Contractor are as described hereunder:

2.1 Part I – General Technical Specifications

The General Specifications for the Works shall be the "Specifications for P & Bridge Works" (5th Revision 2013, published by IRC) issued by the Ministry of Road Transport & Highways (MORTH), henceforth called MORTH Specification.

2.2 Part II – Supplementary Technical Specifications

The Supplementary Technical Specifications shall comprise of various Amendments/Modifications/Additions to the MORTH referred to in Part – I for particular item of works not already covered in Part – I and Specifications for Building, Sanitary, Electrical and Miscellaneous Works.

2.2.1 Where a particular Clause or a part thereof in the "MORTH SPECIFICATIONS" referred in Part-I, has been Amended/Modified/Added upon, and incorporated in Part-II, such Amendment/Modification/ Addition supersedes the relevant Clause or part of the Clause.

2.2.2 The following Clauses in the "MORTH SPECIFICATIONS" have been amended/modified/ added upon:

102, 106, 108, 109, 111, 112, 115, 120, 301, 305, 306, 309, 401, 406, 408, 409, 501, 502, 503, 504, 505, 507, 803, 900, 901, 1007, 1009, 1014, 1404, 1502, 1503, 1603, 1605, 1703, 1706, 1707, 1712, 2005, 2503, 2504, 2600, 2604, 2607, 2608, 2708, 2803, 2804, 3101.

2.2.3 The Additional Specifications shall comprise of specifications of particular item of work not covered in Part-I. These are given new Clause numbers.

The following Clauses A-1 to A-4 have been added to the "MORTH SPECIFICATIONS

Clause A-1	Deleted
Clause A-2	Test Procedure for Measuring Roughness Index of the Riding Surface of A Flexible Pavement
Clause A-3	Deleted
Clause A-4	Specifications for Building, Sanitary, Electrical and Miscellaneous Works

2.2.4 In the absence of any definite provisions on any particular issue in the MORTH Specifications, reference may be made to the latest codes and specifications of IRC, BIS, BS, ASTM, AASHTO in that order. Where even these are silent, the construction and completion of the works shall conform to sound Engineering practice as approved by the Employer and in case of any dispute arising out of the interpretation of the above, the decision of the Employer shall be final and binding on the Contractor.

Amendments/Modifications/Additions to Existing Clauses of General Specifications Referred in the Part – I

Clause 102 : Definitions

The following abbreviations shall be added at the end of Clause 102.

"BIS"	:	Bureau of Indian Standards
"MORTH"	:	Ministry of Road Transport & Highways, Govt. of India.
"RPR"	:	Ranchi Patratu Dam Road
'ITNL"	:	IL&FS Transportation Networks Limited

Add a paragraph at the end of this Clause as under

Wherever in the Specification, the phrase "Condition of Contract" is mentioned, it shall mean General Conditions of Contract and Special Conditions of Contract contained in Section 3 of Volume 1 of Bidding Documents

Clause 106 : Construction Equipment

Add the following after Sub Clause 106 (k).

l) Adequate standby equipment including spare parts shall be available as required, and as may be advised by the Employer.

m) All measuring devices and gauges shall be in good working condition. Measuring devices that can affect product quality shall be calibrated prior to use and at prescribed intervals against certified equipment. Calibration procedures shall be established, maintained and documented and corrective actions taken when results are unsatisfactory. Accuracy and fitness of measuring devices shall be ensured at all times by proper maintenance.

Clause 108 : Site Information

Add the following at the end of Sub-clause 108.3
"Identification of quarry sites and borrow areas is the responsibility of the Contractor. Material to be procured from quarry sites and borrow areas identified by the Contractor and to be used in the works shall be as per Specifications for particular items of work."

Clause 109 : Setting Out

The second sentence in Para 1 of Sub Clause 109.3 shall be inserted and read as under:

"The Reference Bench Mark for the areas shall be GTS Benchmark established by Survey of India and the values of the same shall be obtained by the Contractor from Survey of India."

Clause 111 : Precautions for Safeguarding the Environment

Add new Sub Clause:

Sub Clause 111.13 : Environmental Monitoring Plan

Please refer Annexure 5A

Clause 112 : Arrangement for Traffic During Construction

Sub Clause 112.6 : "Measurements for Payment and Rate" is deleted

Clause 115 : Methodology and Sequence of Work

Sub Clause 120.2 : Description

Add the words "including uninterrupted power supply" to the second sentence of first paragraph.

Add the following at the end of this Sub-Clause:

"Within 14 (fourteen) days of the Commencement Date, the Contractor shall prepare and submit a layout plan and details of the laboratory building and make/supplier of the equipment to the Employer for his approval.

The field laboratory shall be provided in finished and fully equipped condition to the entire satisfaction of the Employer not later than 45 (forty-five) days after the receipt of Notice to Proceed with the Work. During the period till the laboratory is completed the laboratory tests shall be performed in another laboratory proposed by the Contractor and approved by the Employer at the cost of the former."

Sub Clause 120.4 : Laboratory Equipment

The following items of laboratory equipment may also be ensured in the field laboratory:

S. No.	Sub No.	Item, Specifications	Nos. Required
		A : General	
(i)		Balance	
	(a)	7 kg to 10 kg capacity semi-self indicating Electronic Type-Accuracy 1 gm	2
	(b)	500 gm capacity semi-self indicating Electronic Type-Accuracy 0.01 gm	2
	(c)	Chemical balance 100 gm capacity – Accuracy 0.0001 gm	1
	(d)	Pan balance 5 kg capacity – Accuracy 0.5 gm	2
	(e)	Platform Scale – 300 kg capacity	1
(ii)		Ovens – Electrically operated, thermostatically controlled	
	(a)	From 100°C to 220°C – Sensitivity	2
(iii)		Sieves, as per IS 460-1962	
	(a)	IS Sieves 450 mm internal dia of sieve sets as per ISI of required sieve sizes complete with lid and pan	2 sets
	(b)	IS sieve 200 mm internal dia. (brass frame and steel or brass wire cloth mesh) consisting of sieve sets of required sieve sizes complete with lid and pan	2 sets

(iv)		Sieve shaker capable of taking 200 mm and 450 mm dia. Sieves electrically operated with time switch assembly (As per IS)	1
(v)		200 tonnes compression testing machine	1
(vi)		Stop watches 1/5 sec. Accuracy	2
(vii)		Glassware comprising of Beakers, Pipettes, dishes, measuring cylinders (100 to 1000 cc capacity) glass rods and funnels, glass thermometers range 0°C to 100°C and metallic thermometers range 300°C	6 each
(viii)		Hot plates 200 mm dia (1500 watt)	2
(ix)		Enamel trays	
	(a)	600 mm x 450 mm x 50 mm	10
	(b)	450 mm x 300 mm x 40 mm	10
	(c)	300 mm x 250 mm x 40 mm	6
	(d)	Circular plates of 250 mm dia	6
(x)		Water Testing Kit	1

B : For Soils

Deleted

C : For Bitumen and Bituminous Mixes

(i)	Constant temperature bath for accommodating bitumen test specimen, electrically operated and thermostatically controlled	1
(ii)	Penetrometer automatic type, adjustable weight arrangement and needles as per IS : 1203-1978	1
(iii)	Centrifuge type bitumen extraction apparatus complete with extraction thimbles with solvent and filter paper	1
(iv)	Laboratory mixer including required accessories about 0.02 cum capacity electrically operated fitted with heating jacket	1
(v)	Marshall compaction apparatus automatically operated as per ASTM 1559-62 T and complete with electrically operated loading unit, compaction pedestal heating head assembly, dial micrometer and bracket for flow measurement, load transfer bar, specimen mould 100 mm dia (4 in) with base plate, collars, specimen extractor, compaction hammer 4.53 kg (10 lb.) x 457 mm (18 in) fall	1 set
(vi)	Distant Reading Digital Thermometer	1
(vii)	Automatic Asphalt Content Gauge (Nuclear or equivalent)	1
(viii)	1.5 tonne capacity Air Conditioner	1

D : For Cement, Cement Concrete and Materials

(i)		Vicat needle apparatus for setting time with plungers, as per IS : 269-1967	1
(ii)		Moulds	
	(a)	150 mm x 300 mm ht cylindrical moulds with capping component	As required
	(b)	Cubical moulds 150 mm, 100 mm (each size)	As required
(iii)		High frequency mortar cube vibrator for cement testing	1
(iv)		Concrete mixer power driven, 1 cu ft capacity	1
(v)		Variable frequency and amplitude vibrating table size 1 metre x 1 metre, as per the relevant British Standard	1
(vi)		Flakiness & Elongation index test apparatus	1
(vii)		Aggregate impact test apparatus as per IS : 2386 (Part 4) 1963	1
(viii)		10% fines test equipment	1
(ix)		Flow table as per IS : 712-1973	1
(x)		Equipment for slump test	2
(xi)		Equipment for determination of specific gravity for fine and coarse aggregate as per IS : 2386 (Part 3) 1963	1
(xii)		Flexural attachment to compression testing machine	1
(xiii)		Core cutting machine with 150 mm dia. Diamond cutting edge	1
(xiv)		Needle vibrator	1
(xv)		Vibrating hammer as per BS specification	1
(xvi)		Air entrainment meter	1
(xvii)		0.5 Cft cylinder for checking bulk density of aggregate with tamping rod	As required
xviii)		Soundness testing apparatus for cement	1

E : For Checking Alignment, Control of Profile and Surface Evenness

(i)	Precision automatic level with micrometer attachment	2
(ii)	Precision staff	1 set
(iii)	3 metre straight edge and measuring wedge	1 set
(iv)	Camber templates 2 lane, straight run cross-section	2 sets

F : Steel Tape

(a)	5 m long	As required
(b)	10 m long	As required
(c)	20 m long	As required
(d)	30 m long	As required
(e)	50 m long	As required

Note: The laboratory set-up must be complete including a set of reference standards for all tests, adequately staffed and operational to the satisfaction of the Employer before commencement of the works.

Clause 501 : General Requirements for Bituminous Pavement Layers

Sub Clause 501.8.8.2 : Rate for Premixed Bituminous Material

Item (ii) shall read as:

'Preparation of surface to receive the materials except rates for prime / tack coats'

Item (viii) shall be deleted from "with the provision that the variation in actual percentage of bitumen used will be assessed and the payment adjusted accordingly".

Clause 502 : Prime Coat over Granular Base

Sub Clause 502.8 : Rate

Delete last sentence and read it as "Payment shall be made on the basis of the provision of prime coat at an application rate specified in relevant item of BOQ as approval by Employer. No variation is permitted."

Clause 503 : Tack Coat

Sub Clause 503.8 : Rate

Delete last sentence and read it as "Payment shall be made on the basis of the provision of Tack Coat at an application rate specified in relevant item of BOQ as approval by Employer. No variation is permitted."

Clause 507 : Bituminous Concrete

Sub Clause 507.1 : Scope

Add the following at the end of this Clause

"A site trial shall be performed in accordance with Sub Clause 901.6."

Sub Clause 507.3.1 : Requirement for the Mixture

In table 500-12 giving the requirement of Bituminous Concrete mix, add the following:

"Air voids in mix (VIM) determined on Specimens compacted 3% (minimum)

to refusal density by 300 blows of Marshal Hammer on each end”

Clause 803 : Road Markings

Sub Clause 803.3.2

This Sub Clause is substituted to read as under:

“The road marking shall be laid with appropriate road marking machinery as approved by the Employer.”

Add at the end of Sub-clause 803.6.6:

Faulty Workmanship or Materials

If any material not complying with the requirements is delivered at the Site or used in the Works, or if any sub-standard work is carried out, such material or work shall be removed, replaced or repaired as required by the Employer, at the Contractor’s own cost. Rejected traffic markings and paint that has been splashed or has dripped onto the surfacing, kerbs, structures or other such surfaces shall be removed by the Contractor at his own cost, in such a way that the markings of split paint will not show up again later.

Clause 900 : Quality Control for Road Works

Sub Clause 901.1

This Sub Clause is substituted to read as under

“All materials to be used, all methods adopted and all works performed shall be strictly in accordance with the requirements of these Specifications. The Contractor shall set up a field laboratory at location approved by the Employer and equip the same with adequate equipment and personnel in order to carry out all required tests and Quality Control work as per Specifications and/ or as per Clause 121 and/ or as directed by the Employer. The list of laboratory equipments and the facilities to be provided shall be as per Clause 121 or as directed by Employer and shall be approved by the Employer in advance.”

Add new Sub Clause as under:

Sub Clause 901.15 : Site Trial

The following data shall be ordered at each site trial:

- The composition and grading of the material, including the bitumen content and properties, if appropriate;
- If appropriate, the moisture content at the time of laying;
- If appropriate, the temperature at the time of laying and rolling;
- The type and size of compaction equipment and the number of passes;
- The maximum density or target density as appropriate and the density achieved in the trial;
- The maximum compacted thickness of layer;
- Calibration of machinery for best and efficient results;
- Any other relevant information.

If, during execution of the Works, the construction control tests indicate that the requirements for a material are not consistently being achieved, then work on that layer

shall stop until the cause is investigated. Such investigation may include further laboratory and site trials on the material to determine a revised set of data, as above which, when agreed, shall be the basis on which all subsequent material will be provided and processed to achieve the specified requirements.

Approval by the Employer to a set of data recorded, as above in a site trial shall not relieve the Contractor of responsibility to comply with the requirements of Technical Specifications.

Clause 1007 : Coarse Aggregates

(i) Delete from the first sentence "crushed gravel…… inert material" appearing in 4th and 5th Line.

(ii) Add the following at the end of this clause:

"Except where it can be shown to the satisfaction of the Employer that a supply of properly graded aggregate of uniform quality can be maintained over the period of the Works, the grading of aggregate shall be controlled by obtaining the coarse aggregate in different size and blending them in correct proportions as or when required."

Clause 1014 : Storage of Materials

Sub Clause 1014.3: Storage of Materials : Aggregates

The following shall be added to this clause

"Aggregates shall be stored or stockpiled in such a manner that segregation and coarse size will be avoided and also that the various sizes will not become intermixed before proportioning. They shall be stored, stockpiled and handled in such a manner that will prevent contamination by foreign materials.

MICRO SURFACING Type-III

Providing and laying micro surfacing course comprising of dry fine aggregate conforming to Type-III grading of specification, polymer modified cationic slow setting bitumen emulsion (Having 60% binder content 3.6% polymer), ordinary portland cement, chemical additives and water in the following proportion.

(i) Fine aggregate conforming to type-II/III grading @ 9/11 kg. per sqm. of road surface coverage.

(ii) Bitumen emulsion @ 13.5% by weight of fine aggregate.

(iii) Cement @ 1.5-2% by weight of fine aggregate.

(iv) Additive @ 1.5% by weight of fine aggregate or as needed.

(Note: (1) This item includes the cost of any bitumen required as tack coat as per the specification, and all the cost of bitumen emulsion, ordinary Portland cement, chemical additives, aggregates and water.

(2) This item includes the crack sealing with bitumen of grade VG 30-sand grout, if any before applying micro surfacing layer.

(3) This item includes the cost of making surface leveled with any mechanical means before applying micro surfacing layer, if the particular portion is having patchwork above regular road level)

The above mentioned % by weight of ingredients are indicative only. The design mix shall be prepared as per IRC:SP:81-2008 & get it approved from Engineer-in-charge before commencement of work.

MEASUREMENT AND PAYMENT

MEASUREMENT OF THE WORK

The quantity of micro surfacing measured for payment shall be the number of square meters of paved surface conforming to this specification and accepted by the Engineer.

1.0. GENERAL

In general the guidelines and specifications as mentioned in IRC SP 81-2008 including all tables and appendices shall be considered as a primary reference.

1.1 SCOPE

The work shall include lowering of higher level patchwork to the level as directed by engineer in charge, sealing of cracks with VG 30 grade bitumen-sand grout, the design, testing, construction and quality control required for the proper application of Micro surfacing.

1.2 DESCRIPTION

Micro surfacing is a mixture of polymer modified asphalt emulsion, mineral aggregate, mineral filler, water and other additives, properly proportioned, mixed and spread on a paved surface. The mix will be able to accept traffic after a short period of time and the end product will withstand heavy traffic and maintain a skid resistant surface throughout its service life if properly designed and applied.

1.3 REFERENCED STANDARDS

IS 2386 (Part-1) Methods of Test for Aggregate for Concrete : Particle size and shape

IS 2386 (Part-3) Methods of Test for Aggregate for Concrete : Specific gravity, density, voids, absorption and bulking.

IS 2386 (Part-4) Methods of Test for Aggregate for Concrete : Mechanical Properties

IS 2386 (Part-5) Methods of Test for Aggregate for Concrete : Soundness

ASTM C 136 Method for Sieve Analysis of Fine and Coarse Aggregate

ASTM D 1664 Test Method for Coating and Stripping of Bitumen-Aggregates Mixtures.

ASTM D 2172 Test Methods for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures.

ASTM D 2419 Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D 3910 Design, Testing and Construction of Slurry Seal

ASTM E 303 Method for Measuring Surface Frictional Properties Using the British Pendulum Tester,

ASTM E 965 Test Method for Measuring Surface Macrotexture Depth Using a Volumetric Technique

ISSA A 143 Recommended performance guidelines for Micro-Surfacing

ISSA TB 112 Method to Estimate Slurry Seal Spread Rates and to Measure Pavement Macro texture

ISSA TB 145 Test Method for Determination of Methylene Blue Adsorption Value (MBV) of mineral Aggregate Fillers and fines.

1.1.0 MATERIALS

1.1.1 AGGREGATES

The aggregates shall consist of 100% crushed stone, durable, clean and free from earth soil or undesirable particles.

Not less of 90% by weight of the aggregate retained on 4.75 mm sieve shall have at least two fractured faces.

The combined aggregate, when tested according ASTM D2419, shall have a sand equivalent not less than 50. The aggregates methylene blue index when tested according ISSA TB 145, shall be less than 10 mg/g.

Coarse aggregate and parent rock from which the sand is obtained shall conform the requirements in table II-1.

Table II-1. Requirements of aggregates for micro surfacing

Test	Test Method	Requirement
Loss Angeles Abrasion Value1	IS 2386 (Part 4)	max. 40%
Aggregate Impact Value 5	IS 2386 (Part 4)	max. 30%
Flakiness and Elongation Indices (Total)2	IS 2386 (Part 1)	max. 30%
Coating and Stripping of Bitumen Aggregate Mixtures	ASTM D 1664	max. 95%
Soundness		
(i) Loss with sodium sulphate		
(ii) Loss with magnesium silphate	IS 2386 (Part 5)	
5 cycles		
5 cycles		
max. 12%		
max. 18%		
Water absorption	IS 2386 (Part 3)	max. 2%

1.1.2 MINERAL FILLER

Mineral filler will be ordinary port land cement. At the time of use, it shall be sufficiently dry to flow freely and essentially free from agglomerations. The quantity of filler shall be preferably in the range of 0.5 % to 2 % by weight of dry aggregate.

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

2. To determine the combine proportion the flaky stone from a representative sample should be first separated out. Flakiness index is the weight of flaky stone particles divided by the total weight of stone sample. Only the elongated particles should be separated out from the remaining (non-flaky) stone metal. Elongation index is the weight of the elongated particles divided by total non-flaky particles. The value of flakiness index and elongation index are added up.

1.1.3 EMULSIFIED ASPHALT

The binder shall be polymer modified cationic bitumen emulsion of Slow Setting grade, complying with following requirement.

It shall be a modified (polymer modified/Latex modified) bitumen emulsion confirming to requirement specified in Table-8. The modifier shall be polymer/rubber preferably synthetic or natural rubber latex blended into bitumen or aqueous phase of emulsion prior to or during the emulsification process. The bitumen emulsion may also be required to be specifically design for the purpose as per the quality and the grading of aggregates for a climatic condition.

The requirement of modified bitumen emulsion for micro surfacing work shall be as per

Table-8 (As mentioned below) of IRC-SP-81-2008 which shall be assured at all the time.

Requirement Specification Method of Test

Residue on 600 µm IS Sieve (Percent by mass), maximum 0.05 IS 8887

Viscosity by say bolt Furol Viscometer, at 250C, in second 20-100IS 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, % maximum

(b) Penetration at 250C/ 100 g/ 5 s

(c) Ductility at 270C, cm, minimum

(d) Softening Point, in 0C, minimum

(e) Elastic recovery*, %, minimum

(f) Solubility in trichloroethylene, % minimum

60

40-100

50

57

50

97

IS 8887

IS 1203

IS 1208

IS 1205

IS 15462

IS 1216

Coating ability and water resistance

Coating, dry aggregate

Coating, after spraying

Coating, wet aggregate

Coating, after spraying Annex F

IS: 8887

Miscibility with water Nil Annex H IS: 8887

Water content in % Max 40 ASTM D 244

Distillation in %

Oil distillate, by volume of emulsion residue in % 60 - 0 ASTM D 244

* In case, elastic recovery is tested for Torsional Elastic Recovery, the Minimum value shall be 20%.

1. This requirement shall be applicable only under situations where the ambient temperature is below 150C.

2. The residue shall be obtained by distillation when the binder is conventional bitumen and by evaporation for polymer modified binders.

1.1.4 WATER

All water shall be compatible with the slurry mix, and be free of garbage, solids or visually appreciable contaminates.

1.1.5 ADDITIVES

Additives may be used to adjust the break-set of the micro surfacing or improve the resulting finished surface. Its use shall be made initially in quantities determined by the mix design with field adjustments if required.

1.2.0 MIXES

1.2.1 GENERAL COMPOSITION OF THE MIX

A job moisture shall be selected that conforms to the specification limits, and that is suitable for the traffic, climatic conditions, curing conditions and final use.

The mixture shall be one of the types whose characteristics conform to the requirements of Table-II-4. Criteria for the selection of the most suitable type can be found in ISSA A 143, taking into account that the specific conditions of the project can make advisable the use of a different criteria.

Table-II-4. Mix composition and application rates

Sieve Size	Percentage by mass passing	
	Type-II	Type - III
9.5 mm		100
6.3 mm	100	90-100
4.75mm	90-100	70-90
2.36mm	65-90	45-70
1.18mm	45-70	28-50
600 micron	30-50	19-34
300 micron	18-30	12-25
150 micron	10-21	7-18
75 micron	5-15	5-15
Residual bitumen content, % by weight of dry aggregate	7-13	6-11
Application rate of dry aggregates, Kg/m2	8-12	12-16

1.3.0 MIX PROPERTIES

The mix proportions shall be selected to satisfy the values in Table II-5

Table II-5 : Micro surfacing Mix Properties

Test	Standard	Unit	Limits
Consistency	ASTM D 3910	cm	2-3
Set time	ASTM D 3910	min	15-240
Cure Time	ASTM D 3910	min	max. 480
Loss on Wet Track Abrasion Test	ASTM D 3910	g/m2	500

It must be noted that laboratory values may vary from site values. Thus, set and cure time should be checked at the maximum temperature expected during construction. The most important factor is that after proper mixing and laying the mix sets and cures quickly so as to permit opening to traffic as soon as possible.

1.4 PAVED SURFACE CHARACTERISTICS

Once the micro surfacing mix is spread and cured, the paved surface shall meet the following requirements:

Table II-6 : Paved Surface Requirements

Test	Standard	Unit	Limits *	
Mix Type			II	III
Surface Texture	ASTM E 965	mm	min. 0.6	Min. 0.8
Skid Resistance coefficient	ASTM E 303	-	min. 0.55	Min. 0.60

* The mix type mentioned here are the same as given in table-II-4.

1.5 DESIGN PROCEDURE

1.5.1 GENERAL

Before work commences, the contractor shall submit a mix design covering the specific materials to be used on the project. This design must have been performed by a qualified laboratory. The mix shall be designed in such a manner that the quantities of various ingredients of mix i.e. Bitumen Emulsion, Cement, Additive; Fine Aggregate shall not be less than the quantities specified in nomenclature of items for Type-III & Type-II micro surfacing, otherwise the mix design shall not be accepted by the Engineer-in- Charge. No extra payment shall be made for the extra quantities used in the Mix Design beyond the quantities of various ingredients specified in the nomenclature of the items.

1.5.2 LABORATORY REPORT

The laboratory report will show the results of tests performed on the individual materials, comparing their values to those required by this specification. The report shall provide the following information.

a) Characteristics of the materials within the micro surfacing required by this specification.

b) Dosage of aggregates and mineral filler and resulting aggregate gradation.

c) Dosage of asphalt emulsion, water and additives as required

d) Characteristics of the micro surfacing mix, including:

- Consistency
- Set time
- Cure time
- Loss on Wet Track Abrasion Test

1.6 EQUIPMENT

1.6.1 GENERAL

All equipment, tools and machines used in the performance of this work shall be maintained in satisfactory working order at all times.

1.6.2 MIXING EQUIPMENT

The mixing unit shall be truck or trailer mounted. It shall be equipment with a continuous flow mixing unit and will have suitable means of accurately metering each individual material being capable of delivering a predetermined proportion of aggregate, water, additive and asphalt emulsion to the mixer. All feeding mechanism must be continuous feed and proportioning must remain constant at all times. Furthermore, these mechanisms shall allow that the machine can be accurately calibrated and the quantities of materials used during any period can be estimated.

The equipment shall be capable of pre-wetting the aggregate immediately prior to mixing with the emulsion. The mixing unit of the mixer shall be capable of thoroughly blending all of the ingredients together without violent mixing to form a homogenous mass before leaving the mixer and shall be capable of discharging the mixed product continuously. An electronic flow meter shall be fitted to continuously monitor the delivery rate and quantity of the asphalt emulsion. It is convenient that the mix comes to the spreader box through a diverter that allows to distribute the mix in it as necessary.

The mixing machine shall be equipped with an approved fines feeder that includes an accurate metering device or method to introduce a predetermined proportion of mineral

filler into the mixer. The mineral filler shall be fed at the same time and location as the aggregate.

The machine must be equipped with a water pressure system and fog-type spray bar, adequate for complete fogging with water of the surface receiving the micro surfacing treatment. Fog spray bars can be attached at the front of the vehicle or behind the rear axle.

The machine shall also be fitted with a pump, suitable for refilling the emulsion tank from drums or storage tanks.

1.6.3 SPREADING EQUIPMENT

Attached to the mixer machine shall be a mechanical type squeeze distributor, equipped with flexible material in contact with the surface of the pavement to prevent loss of mix on varying grades and crown by adjustments to ensure uniform spread. There shall be a steering device and a flexible strike-off. The spreader box shall be adjustable in width. The box shall be kept clean and build up of asphalt and aggregate on the box or in the corners shall not be permitted. Use of burlap drags or other drags may be approved at the discretion of Engineer - in - charge.

The spreader box shall be equipped with hydraulically driven augers with paddles to agitate and distribute the mix evenly in the spreader box without causing segregation.

The equipment shall be maintained in good working order at all times. In particular, the emulsion tank, pumps, pipe work and emulsion fillers shall be checked and cleaned frequently.

1.6.4 COMPACTION EQUIPMENT

The micro surfaced layer shall be compacted with a self-propelled pneumatic tyre roller, with a tyre pressure of 50 PSI (3.4 atm), equipped with water spray system.

1.6.5 AUXILIARY EQUIPMENT

Hand squeegees, shovels, and other equipment shall be provided as necessary to perform the work.

1.7.1 CLEANING EQUIPMENT

Sufficient equipment shall be provided to thoroughly clean the surface to be covered. The equipment shall include: power blowers, air compressors, water flushing equipment and brooms suitable for cleaning the surface and cracks of the old surface.

1.8 MACHINE CALIBRATION

Each mixing unit to be used in performance of the work shall be calibrated. Previous calibration documentation covering the exact materials to be sued may be accepted provided they were made during the calendar year. The documentation shall include an individual calibration of each material at various settings, which can be related to the machine's metering devices. No machine will be allowed to work on the project until the calibration has been completed and accepted.

1.9 MATERIALS HANDLING AND STOCKPILING

The aggregate shall be stockpiled in an area that drains readily. Precautions shall be taken to prevent contamination of the stockpile by oversize rock, soil or vegetation. The aggregate shall be loaded on to the micro surfacing machine without segregation and shall be protected from prolonged exposure to rain.

The asphalt emulsion may be supplied to the work site in bulk tanks suitably equipped to transfer the emulsion to the micro surfacing machine or in drums.

All water sources shall be checked for suitability and approved by the Engineer before work commences.

1.10 COMPOSITION, RATE OF APPLICATION AND TOLERANCES

1.10.1 COMPOSITION

The percentage of each component shall be as determined by the laboratory mix design after final adjustment in the field. A minimum amount of water shall be added as necessary to obtain a fluid and homogeneous mixture.

A chemical additive diluted in water, or certain quantity of filler, may be added to obtain a workable and homogeneous mixture. The percentage of additive used depends on the type of aggregate, weather conditions and type of emulsion.

1.10.2 RATE OF APPLICATION

Unless otherwise directed by the Engineer-in-charge, the micro surfacing mixture shall be, consisting of aggregate as mentioned in the relevant grading table and at a rate not less than 12 kg per square meter area of road for type III microsurfacing and for microsurfacing type II the same shall not be less than 9 Kg per square meter of surfacing area of road of proper consistency at all times so as to provide the amount required by the surface condition according to Table-II-4. The work shall be carried out as per the job mix approved by the Engineer-in-charge.

1.10.3 TOLERANCES

Tolerances for the micro surfacing mixture and finished surface shall be as follows:

a) After the designed residual asphalt content is determined, a plus or minus one percentage point variation will be permitte.

b) The percentage of aggregate passing each sieve shall not differ more than specified for the different sizes in Table-II-7 from the job mix formula.

Table-II-7 : Tolerances for aggregates respect to the job mix formula

Aggregate size	%
> 2.36 mm	± 5
75 micron to 2.36 mm	± 4
< 75 micron	± 2

c) The mix consistency shall not vary more than ± 0.5 cm from the job mix formula after field adjustments.

d) The average surface texture shall be not less than specified in Section 3.3.

e) The average skid resistance coefficient shall be not less than specified in Section 3.3.

1.11 WEATHER LIMITATIONS

The micro surfacing shall not be applied if the ambient temperature is below 50 C No. micro surfacing shall be applied when there is danger that the finished product will freeze within 24 hours.

The micro surfacing shall be placed only when rain is not threatening. It will not be applied if weather conditions prolongs the curing time beyond a reasonable time.

1.12 PREPARATION OF THE SURFACE

1.12.1 GENERAL

Immediately prior to applying the micro surfacing, the surface shall be cleared of all loose material, silt spots, vegetation, oil spots and other objectionable material. Any standard cleaning method will be acceptable except water flushing when cracks are present in the pavement surface.

Manholes, valve boxes, and other service entrances will be protected before micro surfacing application. Care shall also be taken not to pave over drainage grids or similar features.

1.12.2 TACK COAT

If the micro surfacing is going to be placed over a brick or concrete surface, highly absorbent asphalt surface or over a surface where aggregate has become exposed and is polished or slick, a light tack coat shall be applied. The tack coat material shall be a RS or SS type emulsion diluted with water at 1:2 and shall be applied at a rate of about 0.2-0.6 litre/m2 using a suitable pressurized asphalt distributor.

1.13 APPLICATION

1.13.1 GENERAL

The surface shall be pre-wetted by fogging ahead of the spreader box if required by local conditions. Water used in pre-wetting the surface shall be applied at such a rate that the either surface is damp with no apparent flowing water in front of the spreader box.

The micro surfacing mixture shall be of the desired consistency upon deposit in the spreader box and no additional elements shall be added at this stage. A sufficient amount of mix shall be carried in all parts of the spreader at all times so that complete coverage is obtained. Overloading of the spreader shall be avoided.

No lumping, balling, or unmixed aggregate shall be permitted. No segregation of the emulsion and aggregates fines from the coarse aggregate shall be permitted. If the coarse aggregate settles to the bottom of the mix the material shall be removed from the pavement. No excessive breaking of the emulsion shall be allowed in the spreader box. No streaks, such as those caused by oversized aggregate shall be left in the finished pavement.

1.13.2 JOINTS

Build-up of binder on longitudinal and transverse joints shall be kept to a minimum. An excessive overlap will not be permitted on longitudinal joints. The width of spreading will be adjusted to produce the minimum number of longitudinal joints. When possible, longitudinal joints shall be placed on lane lines. Half passes and odd width passes will be used only in minimum amounts.

1.13.3 HAND WORK

Areas which can not be reached with the micro surfacing machine shall be surfaced using hand squeegees to provide complete and uniform coverage. The area to be hand worked shall be lightly dampened prior to mix placement and the mix worked immediately. Care shall be exercised to leave no unsightly appearance from handwork. The same type finish as applied by the spreader box shall be required. Handwork shall be completed during the machine application process.

1.13.4 CURING

The minimum curing time required before opening to traffic shall be agreed with the Engineer and shall be strictly followed. If drying conditions dictate, the curing time may be extended by either the Engineer of the contractor.

1.13.5 ROLLING

Rolling is normally not required on micro surfacing surfaces. However, in the cases described below and when required by the Engineer, the paved surface will be subjected to a minimum of five complete passes, using a roller as described in 5.4.

The areas where rolling can be necessary include: heavily trafficked areas, slopes, areas with very little traffic, runways, taxiways, tight or elevated truns, truck terminal yards,

airfields, intersections and, in general, areas where breaking, acceleration and steering turns are likely to occur.

Rolling shall start immediately after clear water appears on the surface of the micro surfacing (no stain on a paper) and no pick up on the tires of the roller occur. When rolling is required, it shall be completed before opening to traffic. Normally no rolling takes place on micro surfacing applied to normal asphalt pavement.

1.13.6 TRIAL SECTIONS

Prior to construction it shall be mandatory to perform trial sections (area not less than 280 sq mt for a length of 80 meter and a width of 3.5 meter) to check the suitability of the equipment. These trial sections shall be a part of the project. Samples will be taken to carry out the tests for its compatibility and suitability for the said project. The trial sections shall be repeated until the satisfactory results are found out of the various tests.

Upon failure of any of the tests, additional trial sections will be required until each mixing unit is authorized to work.

No payment shall be made for trial sections and all the charges incidental for performing and executing the trial sections including all material, labour, fuel what so ever used for it, shall be borne by contractor.

1.14 QUALITY CONTROL

1.14.1 BEFORE CONSTRUCTION

Prior to the beginning of the works the contractor will provide the Engineer with the following:

a) A 5 liter sample of the asphalt emulsion that is going to be used in the work, together with a certificate from the manufacturer. The certificate must state the type of emulsion, the type of bitumen used the percentage of asphalt residue and the specification the emulsion complies with.

b) A sample of aggregate mix (10-15 kg) that is going to be used and suitable amount of coarse aggregate 5-20 mm from which the aggregate mix is prepared. The samples shall be submitted with a certificate showing the results in the tests required in section 2. of this specification.

c) A 5 liter sample of the water to be used throughout the construction period.

d) A sample of the additives used, if any.

When performing the trial sections, samples of micro surfacing mix shall be taken and analyzed for determination of residual binder content, aggregate gradation and mix consistency. Verification of rate of application will also be made. The suitability of mix shall be such that it can be opened for traffic within the stipulated time as mentioned in this tender. The trial repetitions shall be performed again, even if all other tests are satisfactory but not passing this time criteria.

1.14.2 DURING CONSTRUCTION

Once in the mix design all the characteristics required for the materials and mix have been determined, during construction, the Contractor shall monitor the quality only according the parameters described in the "List of Mandatory Tests" (Annexure "A") and shall provide the Engineer with the corresponding reports. Besides, samples shall be taken and tested when the Engineer will consider it as necessary in order to check any of the characteristics included in this specification.

Minimum control of the process shall include: cone consistency (ASTM D 3910), residual asphalt content from extraction (ASTM D 2172) and aggregate gradation (ASTM C 136) as well as rate of application (ISSA TB 112).

Initially, the number of samples shall be one per each full micro surfacing machine load at project start. After a period of time the number of samples can be reduced at the discretion of the Engineer. However, under no circumstances it will be less than one per work day per machine.

1.14.3 FINISHED SURFACE

One batch will be considered for the purpose of this specification, as two consecutive micro surfacing machine loads, and it will be accepted or rejected as a unit.

a) Surface texture, according ASTM E 965, not later than 15 days after spreading the micro surfacing.

b) Skid resistance coefficient, according ASTM E 303, 2 months after the mix has been spread.

c) The finished surface shall be compacted adequately with pneumatic tyre roller as mentioned in the tender.

1.14.4 NON COMPLIANCE

If any two successive tests fail on the stockpile material, the job shall be stopped until the contractor can demonstrate to the Engineer that the conditions have been corrected.

If any two successive tests on the mix from the same machine fail, the use of the machine will be suspended until the contractor can demonstrate to the Engineer that the problems have been corrected and the machine is working properly.

1.15 TRAFFIC CONTROL

Suitable methods of traffic control be used to protect the micro surfacing from all types of traffic until it will be sufficiently cured to support the traffic without damage. The micro surfacing surface should normally be opened to traffic as soon as final breaking of the emulsion has occurred. However, it shall be responsibility of the contractor to determine when the surface is safe for opening to traffic.

1.16 MEASUREMENT AND PAYMENT

1.16.1 MEASUREMENT OF THE WORK

The quantity of micro surfacing measured for payment shall be the number of square meters of paved surface conforming to this specification and accepted by the Engineer.

The quantity of aggregate measured for payment shall be the quantity brought at site and used for the work conforming to this specification and accepted by the Engineer.

The quantity of Polymer modified bitumen emulsion measured for payment shall be the quantity brought at site and used for the work conforming to this specification and accepted by the Engineer.

The quantity of cement measured for payment shall be the quantity brought at site and used for the work conforming to this specification and accepted by the Engineer.

In case that tack coat is applied, it will be measured for payment as square meters treated and accepted by the Engineer.

ADDITIONAL SPECIFICATIONS FOR PARTICULAR ITEMS OF WORKS NOT COVERED IN PART – I

Clause A–1 **TEST PROCEDURE FOR MEASURING SURFACE ROUGHNESS INDEX OF THE RIDING SURFACE OF A FLEXIBLE PAVEMENT**

EQUIPMENT – British Towed Fifth Wheel Bump Integrator

Test Procedure:

The following test procedure shall be adopted for the test:

(1) Check the installation and operation of the equipment is in order and meets the requirements prescribed in its operational manual. For example the towing hitch maintains the frame in a upright position but provides freedom of movement in longitudinal and transverse directions. The tyre pressure of wheels is as prescribed.

(2) The instrument shall be calibrated prior to its use for measurement as prescribed in its operational manual.

(3) The operators shall familiarize themselves with the Fifth Wheel Bump Integrator, operation using its Test Mode before commencing a survey.

(4) A uniform speed of 30 km/hour, which is the specified operating speed of the British Towed Fifth Wheel Bump Integrator, shall be maintained during measurements. The readings shall be taken for each carriageway independently.

(5) The equipment shall run on a lane in both the direction once and the average of two values taken for its roughness index.

(6) Pavement unevenness/roughness of 3 lane carriageway shall be obtained from the average of the values of the 3 lanes recorded.

(7) The surface roughness index value is obtained by using the following formula.

$$\textbf{Roughness Index Value} = \frac{B \times R \times 1\ \text{cm/km}}{W}$$

Where

B = Number of Bumps in a section

W = Number of Wheel Revolution Counter

R = is a constant, 1000 nos. of wheel revolution counter per km

Length count of B = 1 cm

(8) All data shall be properly recorded with appropriate referencing and stored in a prescribed manner as in the operational manual.

(9) The roughness measurements shall be properly calibrated using the procedure recommended in the World Bank Technical Publication No. 46.

Permanent "Weigh-in-Motion" Setup

Deleted

A – 4 SPECIFICATIONS FOR BUILDING, SANITARY, ELECTRICAL AND MISCELLANEOUS WORKS

Deleted

Annexure – 5A
(Refer Sub Clause 111.13 of STS)

ENVIRONMENTAL MANAGEMENT PLAN

Sl.#	Environmental Issue	Description
1	Ambient Air Quality	**Construction Phase** • Ambient air quality monitoring for 24 hours twice in a week during summer, winter and post monsoon seasons near residential areas in each of the contract packages, where construction activities are undertaken for parameters like SPM, SO_2, NO_X, CO & HC. In the event of violation of 24 hourly average Indian standard for residential areas, construction activities should be restricted from 6 am to 6 pm. •
2	Noise Quality	**Construction Phase** • $L_{eq\ day}$ and $L_{eq\ night}$ to be monitored on monthly basis (other than for monsoon months) during construction phase near residential areas in each of the contract packages. In case of violations, construction activities are to be scheduled in such a way that the resultant noise levels are adhered to as per the standards. .
3	Water Quality	**Construction Phase** • Monitoring of at least 4 grab samples of surface water and 2 grab samples of groundwater for physical, chemical and biological parameters – once during each season including monsoon season.
4	Soil Quality	**Construction Phase** • Monitoring of at least 1 grab sample of soil from each of the contract packages once during a season (other than monsoon season). The samples should be picked up from 60-70 m distance from centerline in the areas where construction activities are undertaken. The samples should be analyzed for heavy metals and oil & grease.

To implement the EMP, an Environmental Management Cell (EMC) should be constituted before start of the construction work. EMC will undertake environmental monitoring and audits during construction and operation phases of the project and will check that environmental management measures are satisfactorily implemented with appropriate environmental performance. Specialized training should be imparted to construction Employers, contractors, staff and workers for effective implementation of the suggested EMP.

Annexure – 5B
(Refer Clause 112.4 of STS)

TRAFFIC SAFETY AND CONTROL

1. Description

These specifications describe the traffic management and safety measures to be taken by the Contractor throughout the construction period for ensuring the safe and convenient passage of public traffic through the project road on one hand and safety of the project workers on the other. It shall be understood that the Contractor is solely responsible for all the traffic management and safety measures which should be got approved by the Employer prior to taking up any construction work on the project.

Any construction work on or near a public traveled way will pose a set of new situations, which may include diversion of road users on to unfamiliar paths, exposure of road users to moving construction equipment and workers, stacking of construction materials to cause reduction in the space available for public traffic, inadequate space for maneuvering, etc. which may pose several surprises. These may cause to develop hazardous situations in case adequate advance precautions in the form of notification, traffic etc. is not taken. Within the construction area itself, the workers may be handling materials like hot bitumen and moving road construction equipment which may prove to be a cause of serious accident if adequate precaution and safety measures are not taken. Thus, the guiding principles on which the Contractor shall base the traffic management and safety measures will include:

i) advance warning of road users about the road situation including diversion ahead.

ii) providing clear and safe demarcated channels for guiding the public traffic.

iii) providing necessary traffic warning/ guiding devices such as signs, safety cones, pavement markings, red lights, reflecting studs/tapes, etc.

iv) barricading construction area with CGI sheets so that public traffic steer clear of these and do not come into conflict with construction activities.

v) providing the project workers with necessary safety gears such as gum boots, luminous yellow jackets, crash helmets etc. as appropriate.

vi) taking all other necessary measures so that safety is ensured during all hours of day and night.

2. Overlay works Involved in the Project

The Overlay works will have impact on movement of public traffic in the project:

3. Traffic Management and Safety

Any construction activity on the project will pose a hazardous situation to the road users. For least disturbance to safe passage of public traffic appropriate traffic management and safety measures should be adopted throughout the construction period. In this regard, the construction zone in which conflict from safety angle may arise between the road users on one hand and the construction activities on the other shall be divided into 4 sub zones, and safety measures to be adopted therefore shall be as described hereunder:

a) Advance Warning Zone

This warning sub-zone is meant to inform, alert and prepare the approaching driver well in advance by providing information regarding the distance and extent/type of hazard ahead so that he is able to reduce the speed and be in readiness to carry out the necessary manoeuvres as he meets with the changed situation. For the operating speeds on the project road, length of this sub-zone shall be 100 mtr. and 500 m, in plain and hilly terrain respectively. Information in this sub-zone will be conveyed through a series of traffic signs, which will include “Men at Work” and the speed reduction signs at the start and middle of this sub-zone.

b) Transition Sub-Zone

This sub-zone is the area in which the traffic is steered and guided into and out of the diverted path around the work sub-zone. This is the most crucial sub-zone from safety angle as vehicles have to be guided on to the diverted path, and most of the movements will be of turning type. The elements for designing this sub-zone are speed of the vehicles, extent of lateral shift and elevation difference between the normal and the diverted paths. The essential safety measures shall include delineation of the travel path and prevention of wayward movements of vehicles by means of barricades, channelizers, red cones, and red lamps during hours of darkness etc., as appropriate.

In the design of this sub-zone adequate attention shall be paid for providing necessary turning radius of the curves, grade to permit for safe passage of animal driven vehicles, drainage and dust-proofing. Where necessary traffic control shall be effected through manual flagging and by battery operated traffic lights during hours of darkness. Where vehicles have to wait, the waiting area shall be demarcated by stop lines.

Length of the sub-zone will generally be between 50 and 100 m.

c) Work Sub-Zone

This is to the area where construction activity takes place, and the main concern relates to safety of workers are also prevention of public traffic from entering the work area. In this sub-zone, path of traffic shall be clearly delineated to avoid intrusion of public traffic moving on to the work area or construction equipment moving on to the public traffic. It shall be ensured that adequate distance is available between 2 consecutive work zones (2 Km. on urban section and 5-10 km. in rural sections) so that vehicles get sufficient breather space for overtaking slow vehicles, lane adjustment etc. Traffic across this sub-zone shall be guided through with the help of various traffic control devices, such as signs, delineation of travel path by cones/drums, barricades, luminous tapes etc. as appropriate.

d) Termination Sub-Zone

The sub-zone is intended to inform the road users of the end of the construction zone. This shall be effected through suitable informatory sign boards.

The standard on “Safety During Construction” may be referred for compliance.

4. Traffic Control Devices

Traffic control devices in the construction zones perform the crucial task of warning, informing and alerting drivers apart from guiding the vehicle movements so that the drivers of the vehicles as well as the workers on site are not faced with situations posing surprise/hazard, and safe passage to traffic is affected.

The primary traffic control devices used in work sub-zone are signs, delineators, barricades, cones, pylons, pavement marking, flashing lights etc. They shall be such that they are easily understood without any confusion, are clearly visible during day and night, conform to the prevailing speed in immediate vicinity, stable against sudden adverse weather conditions and are easy in installation, renewal and maintenance. Broad details of the different devices are hereunder:

a) Signs

The construction signs fall into 3 major categories namely, regulatory signs, warning signs and guide or informatory sign as defined and detailed in IRC:67-1977, Code of Practice for Road Signs. These signs shall be placed on the left hand side of the travel path.

The common Regulatory signs used in the construction zones are “No Entry”, “Road Closed”, “Speed Limit” etc. These shall be used in consultation with the local police and / or authorities.

The warning signs to alert the drivers of the possible danger ahead in the construction zones are “Lane Closed”, “Diversion to other carriageway”, “Divided carriageway Starts”, “Divided carriageway End”, “Two way Traffic” etc. It will be advisable to explain the signs with the help of a rectangular definition plate of size of appropriate to the size of warning triangle and placed 0.15 m below, from the bottom of the triangle.

Guide signs in construction zones shall different background colour than the normal informatory signs of IRC : 67-1977, These signs shall have black messages and arrows on yellow (Traffic Yellow of IS : 5-1978) background. The guide signs to e commonly used are “Diversion “Road Ahead Closed”, “Sharp Deviation of Rout” etc.

The commonly used temporary signs during construction are depicted in the drawings. These should preferably be of reflectorised type to be visible during hours of darkness.

b) Delineators

Delineators are channelising devices such as cones, traffic cylinders, tapes, drums etc. which are placed in or adjacent to the roadway to guide the driver along a safe path and to control the flow of traffic. These shall normally be retro-refelectorised for night visibility. IRC: 79-1981 (Recommended Practice for Road Delineators) gives details of some of the delineators. The types of delineators commonly used are traffic cones, drums and barricades.

c) Traffic Cones

Traffic cones shall normally be 0.5 m to 0.75 m high and 0.3 m to 0.4 m diameter or in square shape at the base. These shall be made of plastic or rubber with retro reflectorised red and white band and have suitable anchoring so that they are not easily blown over or displaced. The cones shall be placed close enough together (spacing 3-9m) to give an impression of the continuity. Larger sized cones shall be used for high speeds or where more conspicuous guidance is required.

d) Empty Bitumen Drums

Empty bitumen drums can be used as channelising device since they are highly visible, give the appearance of being formidable objects, thereby commanding the respect of the drivers. These drums can also be of plastic which are lighter, easy to transport and store. As delineators, these drums shall be painted in circumferential strips 0.10 m to 0.15 wide, alternatively in black and white colours.

e) Barricades

When ever the traffic has to be restricted from entering the work areas such as excavations or material storage sites so that hazardous locations are barred for public and protection to workers is provided, or there is need for separation the two way traffic, barricades shall be used. The barricades may be of portable or fixed type and can be made of wooden planks, metal or other suitable material. The horizontal component facing the traffic shall be made of 0.30 m wide wooden planks joined together and painted in alternate yellow and white strips of 0.15 m width and sloping down at an angle of 45° in the direction of traffic. Suitable support or ballasting shall be provided so that they do not over turn or are not blown away in strong winds. In case of fixed type barricades, a gate or moveable section shall be separately provided to allow the movement of the construction/supervision vehicles.

f) Flagmen

In large construction sites, flagmen with flags and sign paddles shall be effectively used to guide the safe movements. The flags for signaling shall be 0.60m x 0.60m size made of good red cloth and securely fastened to a staff of approximately 1 meter in length. The sign paddles shall conform to IRC:67-1977 and provided with a rigid handle.

For one-way operation at a time hours of darkness, battery operated red/green lights shall be used at either end of the affected section.

5. Safety and Management Practices

Measures for providing safe movement of traffic in some of the most commonly occurring work-zones on highways shall be as follows:

a) Detour on Temporary Diversion

In certain situations during the project construction period it may become necessary to pass the traffic on temporary diversion constructed parallel to highway.

A temporary diversion road shall basically satisfy the following requirements

- It shall have smooth horizontal and vertical profile for easy negotiation by vehicles.

- It shall not get overtopped by flood or drainage discharge under any circumstances.
- It shall have adequate capacity to cater for the diverted traffic
- It shall be dust free and shall ensure clear visibility at all times of the day and night. Pavement and riding surface for the diversion will depend on the duration over which the diversion will be used, and shall be as directed by the Employer. The commonly used specifications are mix seal surfacing over 150-200 mm thick WMM constructed on completed sub-grade.
- It shall be provided with the required safety standards and

The warning for the construction ahead shall be provided by the sign "Men at Work" about 1 Km. in advance of the work zone. In addition a supplementary plate indication "Diversion 1Km. Ahead "and a sign "Road closed Ahead" shall be placed. It shall be followed by "Compulsory Turn right/left sign". The "Detour" and sharp deviation" sign shall be used to guide the traffic on to the diversion. Hazard markers shall be placed where the railings for the cross drainage structures on the diversion start.

b) Switch over of traffic from widened section and vice-versa

In the course of construction widening of the carriageway will have to be taken up in course of construction widening of the carriageway will have to be taken up in stretches with intervening space between two such stretches. This will bring about the situations in which the traffic passing through the widened road would have to pass on and merge with the unwidened section and vice-versa. For such cases, apart from "Men At Work" signs with distance plate in the advance warning zone, the signs indicating "Road Narrowing" or "Road widening" as appropriate shall be installed.

6. Precautions for Safety

The following general precautions shall apply to all the work sites.

a) General Measures

i) All the sign and delineators shall be maintained in clean and brightly painted conditions at all times.

ii) Adequate lighting arrangements shall be made for proper visibility during night travel through the work area.

iii) Adequate arrangements for frequent sprinkling of water shall be made to keep the area dust free.

b) For Safety of Workmen

i) Workmen shall be trained in use of tools and plant.

ii) Bitumen handling labour shall be given gum boots, spectacles etc.

iii) First –aids kits shall be provided

iv) Workers required on site during night hours shall be provided with fluorescent jackets with reflective tapes.

c) For Safety of Road User

i) As far as possible, the material, equipment and machinery shall be installed/parked in places sufficient away fro the berms in the available road land. Only in avoidable cases the same is allowed near the edge of berms.

ii) Machinery shall be parked at appropriate places away from the path of public traffic, and shall be provided with red flags and red lights.

iii) Only minimum quantity of material required for the construction operations shall be collected at site near the public traveled way.

7. Safety Audit

Safety audit shall be conducted periodically on the safety measures adopted during the constructions operations. The main aspects to be covered shall include:

a) Manpower and their safety

b) Machinery

c) Temporary works

d) Equipment & Vehicles

e) Material storage and handling

f) Construction procedures

g) Environment

h) Site safety guidelines

i) Miscellaneous services

The contractor shall constitute special teams from his staff for the above audit, and shall take appropriate corrective measures to the directions of the Employer.

Annexure – 5C

(Refer Sub Clause 115.2 of STS)

WIDENING OF EXISTING BRIDGES – METHODOLOGY

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Annexure – 5D
(Refer Sub Clause 115.3 of STS)

REPAIR AND WIDENING OF EXISTING BRIDGES-METHODOLOGY

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Annexure – 5E
(Refer Sub Clause 309.6 of STS)

CHUTE DRAIN FOR HIGH EMBANKMENT SECTIONS

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Annexure – 5F
(Refer Sub Clause 1603.1 of STS)

REPAIR OF CORRODED REINFORCEMENT

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Annexure – 5G

(Refer Sub Clause 2803.1.1 of STS)

REPAIR OF CRACKS WIDTH MORE THAN 0.2 MM WITH SOUND CONCRETE SURFACE

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Annexure – 5 H

(Refer Sub Clause 2804.1.2 of STS)

REPAIR OF HONEYCOMBS AND SPALLINGS

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