No. RW/NH-24024/02/2019-S&R(P&B)
GOVERNMENT OF INDIA
MINISTRY OF ROAD TRANSPORT & HIGHWAYS
(S&R(P&B) Section)
Transport Bhawan, 01, Parliament Street, New Delhi-110 001

Dated: 22nd Oct, 2020

To,

1. The Chief Secretaries of all the State Governments/ UTs
2. The Principal Secretaries/ Secretaries of all States/ UTs Public Works Department dealing with National Highways, other centrally sponsored schemes.
3. All Engineers-in-Chief and Chief Engineers of Public Works Department of States/ UTs dealing with National Highways, other centrally sponsored schemes.
4. The Director General (Border Roads), Seema Sadak Bhawan, Ring Road, New Delhi- 110 010.
5. The Chairman, National Highways Authority of India, G-5 & 6, Sector-10, Dwarka, New Delhi-110 075.
6. The Managing Director, NHIDCL, PTI Building, New Delhi-110001
7. All CE-ROs, ROs and ELOs of the Ministry

Subject: - Request for Proposal (RFP) documents for Project Management Consultancy (PMC)

Madam/Sir,

It has been decided to engaged a Project Management Consultancy (PMC) to do the entire consultancy task starting from feasibility study, DPR, pre-construction activities and construction supervision. The entire responsibility of designing, pre-construction activities and quality of work shall be assigned to a single entity known as PMC.

2. Initially, PMC shall be implemented on EPC projects having Total Project Cost (TPC) upto Rs. 1000 Cr for next one year, in respect of National Highways and centrally sponsored road works. PMC may also be engaged in Standalone projects such as Tunnels and Bridges having Total Project Cost (TPC) more than Rs. 1000 Cr during this year.

3. Please find enclosed herewith RFP (part I) and Term of Reference (TOR) & Draft Concession Agreement (part II) of PMC in respect of National Highways and centrally sponsored road works proposed to be implemented on EPC Mode of Contract.

4. The feedback on implementation of the PMC document may be sent to the Ministry for further review of the documents. After one year document will be reviewed based on the experience & feedback.

5. The contents of this Circular may please be brought to the notice of all the Concerned in your Organization.

6. This has been issued with approval of the competent authority.

Encl.: As above

Yours faithfully,

(Jagat Narayan)
Superintending Engineer - S&R (Roads)
For Director General (Road Development) & SS

Copy to:

1. The Secretary General, Indian Roads Congress
2. All CEs in the Ministry of Road Transport & Highways
3. Ministry of Defence, D (BR-I), B wing, 4th Floor, Sena Bhawan, New Delhi-110001.
4. Technical circular file of S&R (R) Section
5. NIC-for uploading on Ministry's website under "What's new"

Copy for kind information to:

1. Sr. PPS to Secretary (RT&H)
2. PPS to DG (RD) & SS
3. PPS to AS&FA
4. PS to ADG-I
5. PS to JS (T)/ JS (H)/ JS (LA&C)

Enclosure of Circular No. RW/NH-24024/02/2019-S&R(P&B) dated 22.10.2020

सड़क परिवहन और राजमार्ग मंत्रालय
MINISTRY OF ROAD TRANSPORT & HIGHWAYS
भारत सरकार Government of India

[Ministry of Road Transport & Highways]

Government of India

PROJECT MANAGEMENT CONSULTANCY SERVICES

FOR

<PROJECT DESCRIPTION>

PART-I

REQUEST FOR PROPOSAL (RFP)

<October 2020>

<Address of Agency>

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PART-I

Ministry of Road Transport and Highways
Government of India
NOTICE INVITING TENDER (NIT)

1. <Agency> has been assigned the work of <Project Description> (as Annexure-I)

2. Proposals are hereby invited from eligible PMC for preparation of Detailed Project Report, Pre construction activity and Project supervision of <Project Description>. The Letter of Invitation (LOI) and Terms of Reference (ToR) including Request for Proposal (RFP) is available online on e-tender portal of https://eprocure.gov.in. The document can also be downloaded from <Agency Website>. Cost of the Document must be furnished in the form of a non-refundable fee of INR 5,000 (Rupees Five Thousand only) by way of online payment only (payment through other modes shall not be accepted), through Bharat Kosh (payable to PAO, W&A Ministry of Road Transport & Highways, New Delhi). The online payment receipt shall be submitted while submitting the proposal. The application form without proof of payment of application fee will be rejected without any intimation. Brief particulars of the work are as follows:

State	Name of the National Highway	Tentative length in km	Estimate PMC cost (in Rs. Cr.)	Assignment period

3. **The RFP has also been uploaded on "INFRACON" (**www.infracon.nic.in). As such before submitting the proposal the PMC shall mandatorily register and enlist themselves (the firm and all key personnel), on the MoRTH portal "INFRACON" and furnish registration details along with its RFP. A copy of Infracon Operation Procedure is also enclosed for bidder's reference.

4. **All the bidders registered on Infracon shall form a Team on Infracon and which would be assigned unique Infracon Team ID. Bidders while submitting the proposal shall quote the Infracon Team ID.**

5. Bid must be submitted online at e-tender portal of <Agency> https://eprocure.gov.in on or before **<Time, Date>.**

6. The following schedule is to be followed for this assignment:

   i) Deadline for downloading of bid: **<Time, Date>**
   ii) Last date for submission of queries: **<Time, Date>**
   iii) Pre bid meeting: **<Time, Date>**
   iv) Deadline for Submission of bids: **<Time, Date>**

Yours sincerely,

<Agency, Location>

Tel: <Tel>
Fax: <Fax>
E-mail: <E-mail>
Website: <Website>

Letter of Invitation (LOI)

<Reference> Dated: <Date>

Dear Sir,

Sub: Project Management Consultancy for <Project Description>

1. Introduction

1.1 The <Agency>has been entrusted with the assignment of <Project Description>. <Agency> now invites proposal from Technical consultants for carrying out detailed project report, Pre construction and supervision as per details given in **Annexure- I**.

1.2 A brief description of the assignment and its objectives are given in the Appendix-I, "***Terms of Reference"***.

1.3.1 The <Agency> invites Proposals (the "**Proposals**") ***through e-tender*** (on-line bid submission) for selection of Technical Consultant (the"Consultant") who shall prepare detailed project report (DPR) Pre construction and construction supervision. The consultant should have expertise in carrying out similar kind of job, in similar geographical location (particularly for hill road projects). Consultants are hereby invited to submit proposal in the manner as prescribed in the RFP document.

A Consultant with "a Particular Team" may submit proposals for more than one package. However, a Consultant is not allowed to bid for a package with more than one team. For the sake of clarity, it is mentioned that one consultant cannot submit two proposals/ bids for the same package.

A Consultant with "a Particular Team" may submit only one "proof of eligibility (Part1)" and "Technical Proposal (Part II)" for any number of packages applied for by them. However, the packages for which a Consultant with "a Particular Team" applies should be clearly mentioned.

Financial proposal for each package are to be submitted separately. Financial proposal are only to be submitted online and no hard copy of the financial proposal should be submitted. The most preferred bidder (H-1) for each package would be determined on the basis of Quality and Costs mentioned in the RFP.

Award of work to a Consultant with "a Particular Team" either as sole or as in JV shall be limited to one package only. Joint venture shall not have more than two firms.

In case, a Consultant with "a Particular Team" turns out to be the most preferred bidder (H-1) in more than one package, the package which is to be awarded to this Consultant with "a Particular Team" shall be determined on the basis of least cost to <Agency> considering the financial quote of H-1 bidder and H-2 bidder limited to those packages, which shall be worked out as per the procedure given in the RFP. The consultants are hereby invited to submit proposals in the manner prescribed in the RFP.

1.3.2 The consultant (s) shall meet the requirement of available bid capacity i.e at least equal to the estimated PMC cost (as indicated in NIT). The available bid capacity will be calculated as under:

Available bid capacity = (A * N * 2.5) - B

Where,

A = Average Annual turnover (year means Financial year) during the last five years updated to the price level of the the year based on factors indicated in table below: **Form T3-A of Appendix-III**.

Year	Year-1	Year-2	Year -3	Year-4	Year-5
Up-dation factor	1.00	1.05	1.10	1.15	1.20

N = Number of years prescribed for completion of the PMC consultancy for which these bids are being invited

B = Value of existing commitments (only allotted works) on the last date of submission of bids as per bidding document and on-going works to be completed during the period of completion of the consultancy for which these bids are being invited.

Note: **The statement (Form T3-A of Appendix-III)** showing the value of existing commitments and on-going consultancy works as well as the stipulated period of completion remaining for each of the works listed should be attached along with certificates duly signed by the Engineer-in-Charge, not below the rank of Executive Engineer or equivalent OR the fees received statement certified by CA can also be submitted as a certificate for ongoing works.

1.4 The consultants shall submit proposals either in sole capacity or in JV. In case of Joint Venture, the maximum number of Joint Venture partners is limited to 2 (i.e. one lead + 1 JV partner) and one associate. Any entity which has been barred by the Ministry of Road Transport and Highways (MORTH) or its implementing agencies for the works of Expressways, National Highways, ISC and EI Works and the bar subsists as on the date of application, would not be eligible to submit the bid, either individually or as a member of a Joint Venture.

1.5 The Applicant, whether a sole applicant or lead member with joint venture may include an Associate for providing key personnel. In such case, the applicant should submit an MOU with associate regarding role and responsibility of Associate Company. However the maximum no. of key personnel from Associate firm during whole consultancy should be limited to maximum two (2) i.e. one at DPR stage and one at Supervision stage.

1.6 To obtain first-hand information on the assignment and on the local conditions, the consultants are encouraged to pay a visit to the client, local State PWDs and the project site before submitting a proposal and attend a pre-proposal conference. They must fully inform themselves of local and site conditions and take them into account in preparing

the proposal.

1.7 Financial Proposals will be opened only for the firms found to be eligible and scoring qualifying marks in accordance with Para 5 hereof. The consultancy services will be awarded to the highest ranking consultant on the basis of Quality and Cost.

1.8 Please note that (i) costs of preparing the proposal and of negotiating the contract, including visits to the Client, etc., are not reimbursable as a direct cost of the assignment; and (ii) Client is not bound to accept any of the proposals submitted and reserve the right to reject any or all proposals without assigning any reasons.

1.9 The proposals must be properly digitally signed as detailed below (submission with DSC)

1.9.1 i. by the proprietor in case of a proprietary firm

ii. by the partner holding the Power of Attorney in case of a firm in partnership (A certified copy of the Power of Attorney on a stamp paper of Rs. 100 and duly notarized shall accompany the Proposal).

iii. by a duly authorized person holding the Power of Attorney in case of a Limited Company or a corporation (A certified copy of the Power of Attorney on a stamp paper of Rs. 100 and duly notarized shall accompany the proposal).

iv. by the authorized representative in case of Joint Venture.

1.9.2 In case of a Joint Venture, the proposal shall be accompanied by a certified copy of legally binding Memorandum of Understanding (MOU) on a stamp paper of Rs.100, signed by all firms to the joint venture confirming the following therein:

i. Date and place of signing

ii. Purpose of Joint Venture (must include the details of contract works for which the joint venture has been invited to bid)

iii. A clear and definite description of the proposed administrative arrangements for the management and execution of the assignment. Name of Lead Firm and other partner of JV should be clearly defined in the MOU

iv. Delineation of duties/ responsibilities and scope of work to be undertaken by each firm along with resources committed by each partner of the JV for the proposed services

v. An undertaking that the JV firms are jointly and severally liable to the Employer for the performance of the services

vi. The authorized representative of the joint venture shall give a Letter of Association, MOU as in (i) to (vi) above except (v), letter of Authorization, copies of GPA/SPA for the person signing the documents and a certificate of incorporation.

1.9.3 In case of Joint venture, one of the firms which preferably have relatively higher experience will act as the lead firm representing the Joint Venture. The duties, responsibilities

and powers of such lead firm shall be specifically included in the MOU/agreement. It is expected that the lead partner would be authorized to incur liabilities and to receive instructions and payments for and on behalf of the Joint Venture. Payment to be made to the JV can also be made to the account of the JV. For a JV to be eligible for bidding, the experience of lead partner and other partner should be as indicated in data sheet.

1.9.4 A firm can bid for a project either as a sole consultant or in the form of joint venture with other consultant. However, alternative proposals i.e. one as sole or in JV with other consultant for the same package will be summarily rejected. In such cases, all the involved proposals shall be rejected.

1.10 Pre-proposal conference shall be held on the date, time and venue given in Data Sheet.

1.11 The Applicant, by submitting its Application pursuant to this RFP, shall be deemed to have acknowledged that without prejudice to the <Agency> any other right or remedy hereunder or in law or otherwise, the Applicant shall be debarred from participating in the future projects of the <Agency> in the following situations:

(a) If an Applicant withdraws its Proposal during the period of its validity as specified in this RFP and as extended by the Applicant from time to time.

(b) In the case of a Selected Applicant, if the Applicant fails to sign the Agreement.

2. Documents

2.1 To enable you to prepare a proposal, please find and use the attached documents listed in the Data Sheet.

2.2 Consultants requiring a clarification of the documents must notify the Client, in writing, by **<Time, Date>.** Any request for clarification in writing or by telefax/e-mail must be sent to the Client's address indicated in the Data Sheet. The Client will upload replies to pre-bid queries on its website.

2.3 At any time before the submission of proposals, the Client may, for any reason, whether at its own initiative or in response to a clarification requested by a Consulting firm, modify the Documents by amendment or corrigendum. The amendment will be uploaded on <Agency> website. The Client may at its discretion extend the deadline for the submission of proposals and the same shall also be uploaded on <Agency> website.

3. Preparation of Proposal

The proposal must be prepared in three parts viz.

Part 1: Proof of eligibility

Part 2: Technical Proposal

Part 3: Financial Proposal

3.1 Document in support of proof of eligibility

3.1.1 The minimum essential requirement in respect of eligibility has been indicated in the Data Sheet. The proposal found deficient in any respect of these requirements will not be considered for further evaluation. The following documents must be furnished in support of proof of eligibility as per Formats given in Appendix-II:

(i) **Forwarding letter for Proof of Eligibility in the Form-E1.**

(ii) **Firm's relevant experience and performance for the last *7* years:** Project sheets in support of relevant experience as per Form-E2/T3 supported by the experience certificates from clients in support of experience as specified in data sheet for the project size preferably in terrain of similar nature as that of proposed project shall be submitted on Infracon portal in input data sheet. Certificate should indicate clearly the firms Design/DPR experience/Supervision/ Authority Engineer, in 2/4-/6- laning of highway**,** structures like bridges, Viaducts, tunnels, hill slope stabilization, rock bolting, ground improvement, etc. Scope of services rendered by the firm should be clearly indicated in the certificate obtained from the client. The information given in Form E2/T3 shall also be considered as part of Technical Proposal and shall be evaluated accordingly. The Consultants are therefore advised to see carefully the evaluation criteria for Technical Proposal and submit the Project Sheets accordingly.

The above details are to be submitted through INFRACON only.

(iii) **Firm's turnover for the last 5 years:** A tabular statement as in Form E3 showing the turnover of the applicant firm(s) for the last five years beginning with the last financial year certified by the Chartered Account along with certified copies of the audit reports shall be submitted in support of the turnover shall be submitted on Infracon Portal in input data sheet.

The above details are to be submitted through INFRACON only.

(iv) **Document fee:** Cost of the Document must be furnished in the form of a non-refundable fee of INR 5,000 (Rupees Five Thousand only) by way of online payment only (payment through other modes shall not be accepted), through Bharat Kosh (payable to PAO, W&A Ministry of Road Transport & Highways, New Delhi). The online payment receipt shall be submitted while submitting the proposal. The application form without proof of payment of application fee will be rejected without any intimation.

(v) **BID Security:-** The bidder has to digitally sign a Bid securing declaration accepting that if the bidder withdraw or modify its bid during the period of validity i. e. not less than bid validity as mentioned in data sheet from the bid due date or if the bidder is awarded the contract and fail to sign the contract or to submit a performance security before the deadline defined in the request for bid documents, the bidder will be suspended for participation in the tendering process for the works of MoRTH/NHAI/NHIDCL and works under other Centrally Sponsored Schemes, for a period of two year from the bid due date of this work and shall be declared non-performing. The bid securing declaration shall be submitted as per the format at Appendix-III-Form –T-12 (Format for Bid Securing Declaration)".

(vi) Power of Attorney on a stamp paper of Rs.100 and duly notarized authorizing to submit the proposal (scanned copies to be uploaded).

(vii) In case of Joint Venture the proposal shall be accompanied by a certified copy of legally binding Memorandum of Understanding (MOU) on a stamp paper of Rs.100, signed by all firms to the joint venture as detailed at para 1.9.2 above. (scanned copies to be uploaded).

3.1.2 The minimum essential requirement in respect of eligibility has been indicated in the data sheet, the proposal found deficient in any respect of these requirements will not be considered for further evaluation.

3.2 Technical Proposal

3.2.1 You are expected to examine all terms and instructions included in the Documents. Failure to provide all requested information will be at your own risk and may result in rejection of your proposal.

3.2.2 During preparation of the technical proposal, you must give particular attention to the following:

Total assignment period is as indicated in the enclosed TOR. ***A manning schedule in respect of requirement of key personnel is also furnished in the TOR which shall be the basis of the financial proposal.*** *You shall make your own assessment of support personnel both technical and administrative to undertake the assignment. Additional support and administrative staff need to be provided for timely completion of the project within the total estimated cost.* ***It is stressed that the time period for the assignment indicated in the TOR should be strictly adhered to.***

3.2.3 The technical proposal shall be submitted strictly in the Formats given in Appendix- III and shall comprise of following documents:

i) Forwarding letter for Technical proposal duly signed by the authorized person on behalf of the bidder, as in Form-T-1.

ii) Details of projects for which Technical and Financial Proposals have been submitted by the PMC with a particular Team as in Form-T-2.

iii) Firm's references - Relevant Services carried out in the last seven years as per Form- E2/T-3. This information submitted as part of Proof of Eligibility shall be evaluated and need not be submitted again as a part of the Technical proposal.

The above details are to be submitted through INFRACON only.

iv) Site Appreciation: limited to four A4 size pages in 1.5 space and 12 font including photographs, if any (Form-T-4).

v) The composition of the proposed Team and Task Assignment to individual personnel: Maximum three pages (Form-T-5).

vi) Proposed methodology for the execution of the services illustrated with bar

charts of activities, including any change proposed in the methodology of services indicated in the TOR, and procedure for quality assurance: The proposed methodology should be accompanied by the consultants initial view, key challenges they foresee and potential solutions suggested regarding: a) proposed alignment and bypass required, b) land acquisition requirements, c) access control, rehabilitaton of existing road, drainage and utilities, d) adoption of superior technology along with proof e) Quality control and assurance f) Faster execution of the project: limited to six A4 size pages in 1.5 space and 12 font including photographs, if any for items a to c, (Form-T-6) and information in Form-T-8 (as covered in para viii below) for item d

vii) The proposal should clearly identify and mention the details of Material Testing lab facilities to be used by the PMC for the project (Form-T-7). In this connection, the proposals of the Consultants to use in-house lab facilities up to a distance of maximum 400 km from the project site being feasible would be accepted. For all other cases suitable nearby material Testing Laboratory shall be proposed before Contract Agreement is executed.

viii). A The proposal shall indicate as to whether the firm is having the facilities for carrying out the following field activities or these are proposed to be outsourced to specialized agencies in the Form- T-8.

(a). Pavement Investigation

(b). Geo-technical Investigation

In case the consultant envisages outsourcing any or all of the above services to the expert agencies, the details of the same indicating the arrangement made with the agencies need to be furnished. These agencies would however, be subject to approval of the client to ensure quality input by such agencies before award of the work. For out-sourced services, proposed firms/consultants should have such experience on similar projects

viii). B The proposal shall indicate as to whether the firm is having the facilities for carrying out the following field activities during the supervision phase or these are proposed to be outsourced to specialized agencies.

- Surface defects detection and roughness measurement using Network Survey Vehicle
- Pavement strength measurement using FWD
- Bridge inspection using Mobile Bridge Inspection Unit or technology
- Road signs inspection using Retro Reflectometer

Viii). C Proposed Quality Audit Methodology including Quality Assurance Plan

ix) Details of office equipment and software owned by the firm in Form-T9

x) a CVs of following 4 (four) Key Personnels may be submitted only through Infracon in Form–T-10

[i) Team Leader cum Senior Highways Engineers,

ii) Senior Bridge Engineer,

iii) Highway cum Pavement Engineer,

iv) Road/Traffic Safety Expert in case of Normal Highway.]

[i) Team Leader cum Senior Bridge Engineer,

ii) Highway cum Pavement Engineer,

iii) Senior Bridge Engineer &

iv) Material cum Geo-Technical Engineer-Geologist in case of Standalone Bridge Project]

[i) Team Leader cum Senior Tunnel Expert,

ii) Tunnel Design Expert,

iii) Senior Geo-Physicist &

iv) Senior Geotechnical Engineer in case Standalone Tunnel Project].

For remaining key personnels during the DPR/ Pre construction activity, the CVs need to be submitted for approval prior to signing of contract. Moreover other key personnel to be deployed during supervision phase, their CVs also need to be submitted for approval prior to start of construction/supervision. **The CV of the all Key Personnels who is proposed to be engaged at any stage of the consultancy should score at least 75 % marks**

x(b) It would be preferred that the team leader cum senior Highway Engineer shall continue during all the Phase 1, 2 & 3 of the aggrement. Authoriry also expects all the key personnel specified in the proposal to be available during implementation of Phase 1 & 2 (DPR & Preconstruction activities).

During phase 3 the team leader shall be equal or better qualification in case the replacement is necessitated. Morover the combined technical score of these 3 key personnels

(i) Resident cum Highway Engineer

(ii) Senior Bridge Engineer

(iii) Highway cum Pavement Engineer

to be deployed during phase 3 (Construction, Supervision & Maintenance) should be equal or more then the Technical score of 3 key personnels (except team leader) as assessed during the technical evaluation. This would ensure that the evaluated preferred bidder during the evaluation stage remain the preferred bidders even in the phase 3 stage (Construction, Supervision & Maintenance).

xi) INTEGRITY PACT (Form –T-11)

xii) BID SECURING DECLARATION (Form-T-12)

3.2.4 CVs of Key Persons:

i) The CVs of the four key personnel as mentioned in para 3.2.3 (x) above in the format as per Form T-10 is to be furnished on Infracon portal. It may please be ensured that the format is strictly followed and the information furnished therein is true and correct. The CV must indicate the work in hand and the duration till which the person will be required to be engaged in that assignment. The Firm shall ensure that details furnished in the CV by the personnel are correct. If any information is found incorrect, at any stage, action including termination and debarment from future <Agency> projects for a minimum period of 2 years may be taken by <Agency> on the personnel and the Firm.

ii. The minimum requirements of Qualification and Experience of all key personnel are listed in Enclosure-II of TOR. CV of a person who does not meet the minimum experience requirement as given at enclosure-II of TOR shall be evaluated and the marks obtained shall be taken into consideration during evaluation of Technical Proposal (except Team leader). However if a firm with such key personnel is declared the "most preferred bidder" for a particular package, such key personnel should be replaced before signing of contract with a person meeting requirements of Qualification and Experience as given at enclosure-II of TOR and whose CV secures 75 % marks and above. If a proposed key personnel does not possess the minimum (essential) educational qualification as given at enclosure-II of TOR, Zero marks shall be assigned to such CV and such CV shall not be evaluated further. **The CV of the proposed Team Leader should score at least 75 % marks otherwise the entire proposal shall be considered to have failed in the evaluation of Technical Proposals** and shall not be considered for opening of Financial Proposals.

iii. [Team Leader cum senior Highway Engineer, Senior Bridge Engineer, Highway cum Pavement Engineer, Material cum Geo-technical engineer, Senior Survey Engineer, Road/Traffic Safety expert, Tunnel Design Expert][1] should be available from beginning of the project. Other Key Personnel with intermittent input are allowed to be deployed/proposed in 3 teams at a time. Further the key personnel required during supervision should also be available as per the requirement/manning schedule. **If same CV is submitted by two or more firms, zero marks shall be given for such CV for all the firms.**

[1]**This is to be modified as per project requirement.**

iv. The availability of key personnel must be ensured for the duration of project as per proposed work programme. If a firm claims that a key personnel proposed by them is a permanent employee of the firm (the personnel should have worked in the firm continuously for a period of at least 1 year), a certificate to the effect be furnished by the firm.

v. The age limit for key personnel is 65 years as on the date of bid submission. The proof of age and qualification of the key personnel must be furnished in the technical proposal.

vi. An undertaking from the key personnel must be furnished that he/she will be available for entire duration of the project assignment and will not engage himself/herself in any other assignment during the period of his/her assignment on the project. After the award of work, in case of non-availability of key personnel in spite of his/her declaration, he/she shall be debarred for a period of two years for all projects of <Agency>.

vii. Age limit for supporting staff to be deployed on project is 65 years as on the date of bid submission.

viii. A good working knowledge of English Language is essential for key professional staff on this assignment. Study reports must be in English Language.

ix. Photo, contact address and phone/mobile number of key personnel should be furnished in the CV.

x. Availability of key personnel engaged for the phase of pre-construction activities and construction supervision shall also be ensured by the consultant.

xi. It may please be noted that in case the requirement of the 'Experience' of the firm/consortium as mentioned in the "Proof of Eligibility' is met by any foreign company, their real involvement for the intended project shall be mandatory. This can be achieved either by including certain man-months input of key experts belonging to the parent foreign company, or by submitting at least the draft feasibility report and draft DPR duly reviewed by the parent firm and their paying visit to the site and interacting with <Agency>. In case of key personnel proposed by the foreign company, they should be on its pay roll for at least last six months (from the date of submission).

xii. In case a firm is proposing key personnel from educational/research institutions, a **'No Objection Certificate'** from the concerned institution should be enclosed with the CV of the proposed key personnel committing his services for the instant project.

3.2.5 The technical proposal must not include any financial information.

3.3 Financial Proposal

3.3.1 The Financial proposal should include the costs associated with the assignment. These

shall normally cover: remuneration for staff (foreign and local, in the field, office etc.), accommodation, transportation, equipment, printing of documents, surveys, geotechnical investigations etc. This cost should be broken down into foreign and local costs. Your financial proposal should be prepared strictly using, the formats attached in ***Appendix – IV***. Your financial proposal should clearly indicate the amount asked for by you without any assumptions of conditions attached to such amounts. Conditional offer or the proposal not furnished in the format attached in *Appendix-IV* shall be considered non- responsive and is liable to be rejected.

3.3.2 The financial proposal shall take into account all types of the tax liabilities and cost of insurance specified in the Data Sheet.

3.3.3 **Costs shall be expressed in Indian Rupees in case of domestic as well as for foreign Consultant**. The payments shall be made in Indian Rupees by the <Agency> and the Consultant themselves would be required to obtain foreign currency to the extent quoted and accepted by <Agency>. Rate for foreign exchange for payment shall be at the rate established by RBI applicable at the time of making each payment installment on items involving actual transaction in foreign currency. No compensation done to fluctuation of currency exchange rate shall be made.

3.3.4 Consultants are required to charge only rental of equipments/ software(s) use so as to economize in their financial bid.

3.3.5 Goods & Service tax as applicable shall be paid to the Consultant while making payment for services rendered. The consultants shall then deposit the same with the tax authorities and provide a proof of having done so within next 90 days in line with policy circulars issued by Employer. Employer shall pay only the Goods & service tax.

3.3.6 Beginning 13th months from the bid due date, billing rates shall be increased to cover all items of contract i.e. remuneration, vehicle hire, office rent, consumables, furniture etc. @ 5% every 12 months. However, for evaluation and award of the Bid proposals, the quoted initial rate (as applicable for first 12 months from last date of submission of bid) shall be multiplied by the total time input for each position on this contract, i.e. without considering the increase in the billing rates.

4. Submission of Proposals

4.1 The Applicants shall submit the proposal (Proof of Eligibility and Technical Proposal) comprising the documents as mentioned under clause 3.1.1 and 3.2.3 respectively to meet the requirements of 'Proof of Eligibility' and 'Technical Proposal' online. **However, documents listed in para 3.1.1 (iv), (v) (vi) & (vii) shall be submitted in original by the successful bidder before issue of LOA in case of non compliance the bidder shall be debarred for** two year from the bid due date of this work and shall be declared nonperforming**.** A Consultant with "a Particular Team" may submit only one proposal of "proof of eligibility (Part 1, para 5.1)" and "Technical Proposal (Part II)" to <Agency> for all the packages applied by them with a particular team on or before the deadline of submission of bids. A consultant can apply for a particular package with one team only. The packages for which a Consultant with "a Particular Team" applies should be clearly

mentioned in their proposal. However, Consultants are required to submit a copy of Proof of Eligibility and Technical Proposal online separately for each package. Financial proposal for each package are to be submitted separately. Financial proposal are to be submitted online and no hard copy of the financial proposal should be submitted.

The document listed in para 3.1.1 (iv), (v) (vi), (vii) shall be digitally submitted by all the bidders to the Authority while submitting the proposal..

4.2 The proposal must be digitally signed by the authorized representative of the consultants. The letter of authorization must be confirmed by a written power of attorney accompanying the proposals. All pages of the Proof of Eligibility and Technical Proposal must be initialed by the person or persons signing the proposal.

4.3 The proposal must contain no interlineations or overwriting except as necessary to correct errors made by the Consultants themselves, in which cases such corrections must be initialed by the person or persons signing the proposal.

4.4 Your proposal must be valid for the number of days stated in the Data Sheet from the closing date of submission of proposal.

5. Proposal Evaluation

5.1 Stage I- Proof of Eligibility

The proposals would be evaluated by a Committee constituted by <Agency>. A three-stage procedure will be adopted in evaluating the proposal. In the first stage- Proof of Eligibility, it will be examined as to whether:

i) The proposal is accompanied by Document fee

ii) The proposal is accompanied by Bid Scuring declaration form as per Form-T-12 of Annexure-III.

iii) The firms(s) have required experience

iv) The firms(s) have required turnover

v) The documents are properly digitally signed by the authorized signatories and whether the proposal contains proper POA (digitally) as mentioned at para 1.9.1 above

vi) The proposals have been received on or before the dead line of submission.

vii) In case a Joint Venture of firms, the proposal shall be accompanied by a digitally signed certified copy of legally binding Memorandum of Understanding (MOU) on a stamp paper of Rs.100, signed by all firms to the joint venture as detailed at para 1.9.2 above

In case answers to any of the above items is 'No' the bid shall be declared as non-responsive and shall not be evaluated further.

A Consultant satisfying the minimum Eligibility Criteria as mentioned in the Data sheet and who had submitted the above-mentioned documents shall be declared "pass" in Proof of Eligibility and the Technical Proposals of only those consultants shall be opened and evaluated further.

5.2 Stage II- Technical evaluation

In the second stage the Technical proposal shall be evaluated as per the detailed evaluation criteria given in Data Sheet.

A proposal securing 75 marks shall be declared pass in the evaluation

Technical Proposal: **The technical proposal should score at least 75 marks out of 100 to be considered for financial evaluation**. **The CV of the proposed Team Leader should score at least 75 % marks otherwise the entire proposal shall be considered to have failed in the evaluation of Technical Proposals** and shall not be considered for opening of Financial Proposals.

5.3 Stage III-Evaluation of Financial Proposal

5.3.1 In case for a particular package, only one firm is eligible for opening of Financial Proposals, the Financial Proposal shall not be opened, the bids for that package shall be cancelled and fresh bids for this package shall be invited. For financial evaluation, total cost of financial proposal excluding Goods & Service tax shall be considered. Goods & Service tax shall be payable extra.

5.3.2 The evaluation committee will determine whether the financial proposals are complete (i.e. whether they have included cost of all items of the corresponding proposals; if not, then their cost will be considered as NIL but the consultant shall however be required to carry out such obligations without any compensation. In case, if client feels that the work cannot be carried out within overall cost of financial proposal, the proposal can be rejected. The client shall correct any computational errors and correct prices in various currencies to the single currency specified in Data Sheet. The evaluation shall exclude those taxes, duties, fees, levies and other charges imposed under the applicable law & applied to foreign components/ resident consultants.

5.3.3 For **a package in which 2 firms are eligible for opening of Financial proposals,** the procedure as mentioned at Clauses 5.3.4, 5.4 and, 5.5 as mentioned below shall be followed for determining the "most preferred bidder (H-1 bidder)" for this package.

5.3.4 The lowest financial proposal (FM) will be given a financial score (SF) of 100 points. The financial scores of other proposals will be computed as follows:
SF = 100xFM/F
(SF = Financial Score, FM= Amount of lowest bid, F= Amount of financial proposal converted in the common currency)

5.4 Combined evaluation of Technical and Financial Proposals.

Proposals will finally be ranked according to their combined technical (ST) and Financial

(SF) scores using the weights indicated in the Data Sheet:

S= STxT + SFxf

Where,

S=Combined Score,

ST=Technical Score out of 100

SF= Financial Score out of 100

T and f are values of weightage for technical and financial proposals respectively as given in the Data Sheet.

5.5 Most Preferred Bidder (H-1).

For a particular package, a Consultant with a "particular Team" having the maximum Combined score (S) shall be declared as the **most preferred bidder** (H-1).

5.6 In case work has to be awarded for multiple packages, award of work to a Consultant with "a Particular Team" either as sole or as in JV shall be limited to one package only. At first, Consultants who become H-1 in one package each shall be assigned the respective package. Then packages in which a Consultant with "a Particular Team" turns out to be the most preferred bidder (H-1) in more than one package shall be considered. In case, a Consultant with "a Particular Team" turns out to be the most preferred bidder (H-1) in more than one package, the package which is to be awarded to this team of a consultant shall be determined on the basis of least cost to <Agency> considering the Financial Quote of H-1 bidder and H-2 Bidder limited to those packages. Procedure to be followed for awarding work based on QCBS including assessment of least cost to <Agency> under special circumstances i.e. When a Consultant with "a Particular Team"turns out to be the most preferred bidder (H-1) in more than one package is given at Annexure-II.

6. Performance Security

6.1 The consultant will furnish within 15 days of the issue of Letter of Acceptance (LOA), an unconditional Bank Guarantee equivalent to 2.0 % of the total contract value from a Nationalized Bank, IDBI or ICICI/ICICI Bank/Foreign Bank/EXIM Bank / Any Scheduled Commercial Bank approved by RBI having a net worth of not less than Rs.1000 crore as per latest Annual Report of the Bank. In the case of a Foreign Bank (issued by a Branch in India) the net worth in respect of Indian operations shall only be taken into account. In case of Foreign Bank, the BG issued by Foreign Bank should be counter guaranteed by any Nationalized Bank in India. In case of JV, the BG shall be furnished on behalf of the JV or by the lead member of the JVs towards Performance Security valid initially for a period of two year which can be extendable from time to time. **The Bank Guarantee will be released by <Agency> upon expiry of contract. However, if contract is foreclosed / terminated by <Agency> at any Stage, with no fault of Consultant, Performance Security shall be released within three months from date of foreclosure / termination.**

6.2 In the event the PMC fails to provide the security within 15 days of date of LOA, it may seek extension of time for a period of 15 (Fifteen) days on payment of damages for such extended period in a sum of calculated at the rate of 0.05% (Zero Point Zero Five Percent) of the Bid price for each day until the performance security is provided. For the avoidance of doubt the agreement shall be deemed to be terminated on expiry of additional 15 days time period.

6.3 Not withstanding anything to the contrary contained in this Agreement, the Parties agree that in the event of failure of the PMC to provide the Performance Security in accordance with the provisions of Clause 6.1 within the time specified therein or such extended period as may be provided by the Authority, in accordance with the provisions of Clause 6.2, all rights, privileges, claims and entitlements of the Consultant under or arising out of this Agreement shall be deemed to have been waived by, and to have ceased with the concurrence of the Consultant and the LoA shall be deemed to have been withdrawn by mutual agreement of the Parties. Authority may take action to debar such firms for future projects for a period of 2 years.

7. Penalty

The consultant will indemnify for any direct loss or damage that accrue due todeficiency in services. Penalty shall be imposed on the consultants for poor performance/deficiency in service as expected from the consultant and as stated in General Conditions of Contract.

8. Deleted.

9. Signing of Contract Agreement

After having received the performance security and verified it, the Client shall invite the selected bidder for signing of Contract Agreement on a date and time convenient to both parties within 15 days of receipt of valid Performance Security.

10. The Client shall keep the bidders informed during the entire bidding process and shall host the following information on its website:

i) Notice Inviting Tender (NIT)

ii) Request For Proposal (RFP)

iii) Replies to pre-bid queries, if any

iv) Amendments/corrigendum to RFP

v) List of bidders who submitted the bids up to the deadline of submission

vi) List of bidders who did not pass the eligibility requirements, stating the broad deficiencies

vii) List of bidders who did not pass the Technical Evaluation stating the reasons.

viii) List of bidders along with the technical score, who qualified for opening the financial bid

ix) Final Score of qualified bidders

ix) Name of the bidders who is awarded the Contract

11. It is the <Agency> policy that the consultants observe the highest standard of ethics during the selection and execution of such contracts. In pursuance of this policy, the <Agency>:

(a) Defines, for the purpose of this paragraph, the terms set forth below as follows:

(i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the action of a public official in the selection process or in contract execution;

(ii) "fraudulent practice" means a misrepresentation or omission of facts in order to influence a selection process or the execution of a contract;

(iii) "collusive practices" means a scheme or arrangement between two or more consultants with or without the knowledge of the Client, designed to establish prices at artificial, non-competitive levels;

(iv) "coercive practices" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in a procurement process, or affect the execution of a contract.

(b) will reject a proposal for award if it determines that the Consultant recommended for award has, directly or through an agent, engaged in corrupt, fraudulent,

collusive 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, to be awarded a contract if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a contract; and

(d) Will have the right to require that a provision be included requiring consultants to permit the Employer to inspect their account and records relating to the performance of the contract and to have them audited by authorized representatives of Employer."

(e) Any defaulting bidder who fails to sign the aggrement after issuance of LOA or found practising fraudulent activity may be declared non-performer for a period of 2 years, which will not be allowed to bid in project/tenders called by Ministry and its agencies.

12. **Confirmation**

We would appreciate you informing us by facsimile/e-mail w*hether or not you will submit a proposal.*

Thanking you.

Yours Sincerely,

<Agency, Location>

Encl. as above

ANNEXURE-I

Details of the stretch proposed for PMC

<Description of packages>

S. No.	NH No.	Section	State	TentativeLength(in km)	Package No.
1	2	3	4	5	6

ANNEXURE-II

Procedure of Awarding Work based on QCBS including Assessment of Least Cost to <Agency> under Special Circumstances i.e. When a Consultant with a particular team becomes H-1 bidder in more than one package

A Consultant with a particular Team can apply for any number of packages with one team. However, Award of work to a Consultant with "a Particular Team" either as sole or as in JV shall be limited to one package only**.** Following procedure shall be followed for the selection of the most preferred bidder for the consultancy assignment:

1. **At first, Consultants who become H-1 in one package each shall be assigned the respective package.** Then packages in which a Consultant with "a Particular Team" turns out to be the most preferred bidder (H-1) in more than one package shall be considered. In case, a Consultant with "a Particular Team" turns out to be the most preferred bidder (H-1) in more than one package, the package which is to be awarded to this team of a consultant shall be determined on the basis of least cost to <Agency> considering the Financial Quote of H-1 bidder and H-2 Bidder limited to those packages which shall be worked out as per procedure illustrated with an example as mentioned below.

2. Suppose there are 8 packages namely Package-1, Package-2, Package -3, Package-4, Package -5, Package -6, Package-7 and Package-8 respectively. It is also assumed that 10 consultants namely P, Q, R, S, T, U, V, W, X and Y has applied for these packages. It is also assumed that three Consultants namely P, R and U have applied with two Teams and the remaining Consultants have applied with only one team. It is also assumed that the following is the position of various firms after opening of the Financial proposals (and after arithmetic corrections if any of the Financial bids) of the packages and after applying QCBS

	H-1	H-2	H-3	H-4	H-5	H-6
Package no.	Name of Consultants and Financial Quotes (Rs in lakhs)					
Package-1	P (team-1)	Q	W	X	T	Y
	230 lakhs	200 lakhs	240 lakhs	220 lakhs	200 lakhs	230 lakhs
Package-2	V	U(team-1)	X	P (team-2)	T	Y
	240 lakhs	210 lakhs	240 lakhs	220 lakhs	200 lakhs	230 lakhs
Package-3	V	P(team-1)	U(team-1)	R (team-2)	X	Y
	200 lakhs	230 lakhs	250 lakhs	230 lakhs	220 lakhs	200 lakhs
Package-4	R (team-1)	T	U (team-2)	P (team-2)	Y	X
	250 lakhs	220 lakhs	250 lakhs	260 lakhs	220 lakhs	245 lakhs
Package-5	R (team-1)	V	S	U(team-2)	W	T
	220 lakhs	240 lakhs	260 lakhs	250 lakhs	220 lakhs	240 lakhs
Package-6	Q	T	S	P (team-2)	W	U (team-2)
	210 lakhs	240 lakhs	250 lakhs	220 lakhs	200 lakhs	230 lakhs
Package-7	R (team-1)	U (team-1)	Q	S	W	Y
	200 lakhs	220 lakhs	240 lakhs	255 lakhs	230 lakhs	240 lakhs
Package-8	V	R(team-1)	W	S	P (team-1)	Y
	190 lakhs	250 lakhs	220 lakhs	240 lakhs	255 lakhs	240 lakhs

The different packages shall be awarded to consultants as mentioned below:

2.1 **Step-1:**

In this case, Consultants P (team-1) and Q are the H-1 in only one package each namely package-1 and package-6 respectively. Consultant V is H-1 in 3 packages namely Package-2, Package-3 and Package-8 respectively. Consultant R (team-1) is H-1 in 3 packages namely Package-4, Package-5 and Package-7 respectively. Since Consultant P (team-1) is H-1 in Package-1 only and Consultant Q is H-1 in Package-6 only, **Consultant P (team-1) shall be awarded Package-1 and Consultant Q shall be awarded Package-6**.

2.2 **Step-2:**

After **Consultant P (team-1) is awarded Package-1 and Consultant Q is awarded Package-6, the scenario for the remaining 6 packages is as given below**. P (team-1) and Q occurring anywhere else stands deleted as they have already been awarded one work each

	H-1	H-2	H-3	H-4	H-5	H-6
Package No.	Name of Consultantsand Financial Quotes (Rs in lakhs)					
Package-2	V	U(team-1)	X	P (team-2)	T	Y
	240 lakhs	210 lakhs	240 lakhs	220 lakhs	200 lakhs	230 lakhs
Package-3	V	U(team-1)	R (team-2)	X	Y	
	200 lakhs	250 lakhs	230 lakhs	220 lakhs	200 lakhs	
Package-4	R (team-1)	T	U (team-2)	P (team-2)	Y	X
	250 lakhs	220 lakhs	250 lakhs	260 lakhs	220 lakhs	245 lakhs
Package-5	R (team-1)	V	S	U (team-2)	W	T
	220 lakhs	240 lakhs	260 lakhs	250 lakhs	220 lakhs	240 lakhs
Package-7	R (team-1)	U (team-1)	S	W	Y	
	200 lakhs	220 lakhs	255 lakhs	230 lakhs	240 lakhs	
Package-8	V	R(team-1)	W	S	Y	
	190 lakhs	250 lakhs	220 lakhs	240 lakhs	240 lakhs	

Consultant V shall be awarded only one package out of the 3 packages for which it is H-1 namely Package-2, Package-3 and Package-8 respectively. Similarly Consultant R (team-1) shall be awarded only one package out of the 3 packages for which it is H-1 namely Package-4, Package-5 and Package-7 respectively. The determination of package to be awarded to Consultant V and Consultant R (team-1) shall be worked out in a single step (i.e. one at a time). New H-1 for the remaining packages (4 packages) shall be worked out only after determination of packages to be awarded to the H-1 bidders at this stage [i.e. Consultant V and R (Team-1) in the instant case] in one step. Determination of Package to be awarded to each of Consultant V and Consultant R (team-1) shall be worked out as follows:

(i) After the award of Package-1 to Consultant–P (team-1) and Package-6 to Consultant –Q

and also considering that a Consultant with a particular team can be awarded only one work, **the details of H-1 and H-2 / New H-2 in the remaining 6 packages areas mentioned below. Since V is H-1 in more than one package and shall be awarded one of these packages, V has been deleted from all other packages. Similarly, since R (Team-1) in more than one package and shall be awarded one of these packages, R (Team-1) has been deleted from all other packages**

	H-1	H-2 / NewH-2	Remarks
Package-2	V	U(team-1)	
	240 lakhs	210 lakhs	
Package-3	V	U(team-1)	Since Consultant P (Team-1) is awarded Package-1, Consultant **U (team-1) becomes the new H-2**
	200 lakhs	250 lakhs	
Package-4	R (team-1)	T	
	250 lakhs	220 lakhs	
Package-5	R (team-1)	S	
	220 lakhs	260 lakhs	
Package-7	R (team-1)	U (team-1)	
	200 lakhs	220 lakhs	
Package-8	V	W	Consultant-R (team-1) has not been considered as H-2 since Consultant –C (team-1) is to be awarded one package out of the packages 4, 5 and 7 in which it is H-1. Hence **Consultant – W is the new H-2**
	190 lakhs	220 lakhs	

(ii) Package to be awarded to Consultant –V who is H-1 in three packages namely Package - 2, 3 and 8 respectively shall be determined on the basis of least cost to <Agency> considering the Financial Quote of H-1 bidder and H-2 Bidder limited to those packages The situation for least cost to <Agency> shall be when the firm with Consultant **–G is awarded the package for which Financial Bid of second ranked team (H-2) minus Financial Bid of the first ranked team (H-1) is maximum.** The same is illustrated as given below

	H-1	H-2/NewH-2	Financial Bid of H-2/New H-2 minus Financial Bid of H-1	Remarks
Package-2	V	U(team-1)	210-240 = (-) 30 lakhs	
	240 lakhs	210 lakhs		
Package-3	V	U(team-1)	250 – 200 = **(+) 50 lakhs**	H-2 minus H-1 is Maximum. Hence **Consultant V shall be awarded Package-3**
	200 lakhs	250 lakhs		

Package-8	V	W	220–190=(+)30 lakhs	

In a similar way, **Package to be awarded to Consultant – R (team-1) who is H-1 in three packages namely Package -4, 5 and 7 respectively shall be determined as illustrated below:**

	H-1	H-2/NewH-2	Financial Bid of H-2/New H-2 minus Financial Bid of H-1	Remarks
Package-4	R (team-1)	T	220-250 = (-) 30 lakhs	
	250 lakhs	220 lakhs		
Package-5	R (team-1)	S	260 – 220 = **(+) 40lakhs**	H-2 minus H-1 is **Maximum**. Hence **Consultant – R (team**-1) **shall be awarded Package- 5**
	220 lakhs	260 lakhs		
Package-7	R (team-1)	U (team-1)	220–200=(+)20lakhs	
	200 lakhs	220 lakhs		

2.3 **Step-3**

(i) **After the award of the above mentioned 4 packages** namely, Package-1 to Consultant–P (team-1), Package -6 to Consultant –Q, Package -3 to Consultant –V, Package -5 to Consultant –R (team-1) and also considering that a Consultant with a particular team can be awarded only one work, **the details of new H-1 and New H-2in the remaining 4 packages are as mentioned below**

	H-1 (New H-1)	H-2(NewH-2)	Remarks
Package-2	U(team-1)	X	Since Consultant V is awarded Package-3, **Consultant U (team-1) becomes the new H-1 and Consultant X becomes the new H-2**
	210 lakhs	240 lakhs	
Package-4	T	U (team-2)	Since Consultant-R (team-1) is awarded Package-5, **Consultant T becomes the new H-1 and Consultant U (team-2) becomes the new H-2**
	220 lakhs	240 lakhs	
Package-7	U (team-1)	S	Since Consultant R (team-1) is awarded Package-5 , **Consultant U (team-1) becomes the new H-1 and Consultant S becomes the new H-2**
	220 lakhs	255 lakhs	
Package-8	W	S	Since Consultant V is awarded Package-3, **Consultant W becomes the new H-1 and**
	220 lakhs	240 lakhs	

			Consultant S becomes the new H-2

(ii) Consultant T is the new H-1 for only one package namely Package-4. Similarly Consultant W is the new H-1 for only one package namely Package-8. Accordingly **Package- 8 shall be awarded to Consultant–W** and **Package -4 shall be awarded to Consultant–T.**

2.4 **Step-4:**

Consultant U (team-1) is the new H-1 for package- 2 and Package-7 respectively and Consultant U (team-1) shall be awarded only one package out of this 2 packages. Package **to be awarded to Consultant –U (team-1) shall be determined as illustrated below**

	H-1	H-2/NewH-2	Financial Bid of H-2/New H-2 minus Financial Bid of H-1	Remarks
Package-2	U(team-1)	X	240-210 =(+)30lakhs	
	210 lakhs	240 lakhs		
Package-7	U (team-1)	S	255 – 220 = **(+) 35lakhs**	H-2 minus H-1 isMaximum. Hence **Consultant – U (team-1) shall be awarded Package- 7**
	220 lakhs	255 lakhs		

2.5 **Step-5 :**

(i) **After the award of the above mentioned 7 packages** namely, Package-1 to Consultant–P (team-1) , Package -6 to Consultant –Q, Package -3 to Consultant –V, Package -5 to Consultant –R (team-1), Package-4 to Consultant -T, Package -8 to Consultant-W, package-7 to Consultant –U (team-1) team and also considering that a Consultant with a particular team can be awarded only one work , **the details of new H-1 and / New H-2 in the remaining package i.e. package -2 is as mentioned below**

	H-1 (NewH-1)	H-2 (NewH-2)	Remarks
Package-2	X	A (team-2)	Since Consultant V is awarded Package-3 and **Consultant U (team-1) is awarded package- 7 , Consultant X becomes the new H-1 and Consultant P (team-2) becomes the new H-2**
	240 lakhs	220 lakhs	

(ii) Consultant X is the new H-1 for only one package namely Package-2. Accordingly, Package **-2 shall be awarded to Consultant –X**.

3. Thus as per the above mentioned procedure **the 8 packages are awarded to the following Consultant at the Financial Quoted (after arithmetic Corrections) by them for the respective packages**

Package No.	Name of Consultants awarded packages
Package-1	Consultant- P (team-1)
Package-2	Consultant- X
Package-3	Consultant-V
Package-4	Consultant- T

Package-5	Consultant- R (team-1)
Package-6	Consultant- Q
Package-7	Consultant-U (team-1)
Package-8	Consultant-W

DATA SHEET

I (References to corresponding paragraphs of LOI are mentioned alongside)

1. **The Name of the Assignment and description of project as mentioned in Annexure-I** (Ref. Para 1.1)

   (The Name of project and Package No. should be indicated in the format given in the technical proposal)

2. **The name of the Client is** :<Name of Client>

3. **Duration of the Project: to be decided by client (suggestive 10 months for DPR+8 months for preconstruction activity+24 month for the construction years+5 years for Maintenance). However if after finalisation of DPR, if the project has not been awarded within 2.5 years then the consultant is free to exit from the PMC work .**

4. **Date, Time and Venue of Pre-Proposal Conference**

   Date: <Date>

   Time: <Time>

   Venue: <Venue>

5 **The Documents are**:

PART-I

i.	Appendix-IA:	Manning Schedule for Project (Phase I, II & III)
ii.	Appendix-IB:	Qualification and Experience requirement (Phase I, II & III)
iii.	Appendix-II:	Formats for Proof of Eligibility
iv.	Appendix-III:	Formats for Technical Proposal
v.	Appendix-IV:	Formats for Financial Proposal
vi.	Appendix-V:	Detailed Evaluation Criteria

PART-II

vii.	Appendix-VI:	Terms of Reference
viii.	Appendix –VII:	Draft Contract Agreement
ix.	Appendix –VIII:	DPR Checklist
x.	Appendix –IX:	Sample Executive Summary

(Ref. Para 2.1)

6. **Deleted**

7. **Tax and Insurance** (Ref. Para 3.3.2)

(i). The Consultants and their personnel shall pay all taxes (including Goods & service tax), custom duties, fees, levies and other impositions levied under the laws prevailing seven days before the last date of submission of the bids. The effects of any increase / decrease of any type of taxes levied by the Government shall be borne by the Client / Consultant, as appropriate.

(ii). Limitations of the Consultant's Liability towards the Client shall be as per Clause 3.4 of Draft Contract Agreement

(iii). The risk and coverage shall be as per Clause 3.5 of Draft Contract Agreement.

8. Deleted

9. Deleted

10. The date, time and Address of proposal submission are

Date	**<Date>**
Time	**<Time>**
Address	**<Address>**

11. Proposal Validity period (Number of days): 120 days (Ref. Para 4.4)

12. Evaluation criteria: (Ref. Para 3 & 5)

12.1 First stage evaluation – eligibility requirement. (Ref. Para 3.1 & 5.1)

Table-1: Minimum Eligibility Requirements

Sr.No.	Minimum experience and performance of Preparation of DPR/Supervision of construction of Highways / Bridges in the last 7 years (NH/SH/Equivalent) (for past performance attach undertaking for any litigation history/ and arbitration).	Annual average turnover
1	A Firm applying for a package should have Experience of preparation of Detailed Project Report of two/four/six lane / Feasibility of Two/ four/ six lane projects of aggregate length equal to the indicative length of the package (i.e. 100km if the indicative length of the package is 100 km). Firm should have also prepared DPR for at least one project of 2/4/6 laning of minimum 40% of the indicative length of the package (i.e. 40 km if the indicative length of the package is 100 km) or Feasibility Study of two/four/six laning of minimum 60% of the indicative length of the package (i.e. 60 km if the indicative length of the package is 100 km) Note: The experience of a firm in preparation of DPR for a private concessionaire/contractor shall not be considered unless certified by the client (Road owning authority).	Annual average turnover for last 5 years of the firm should be equal to or more than **Rs.10.00 Crores. (Updated to the factor as per clause 1.3.2 of LOI)**
2	The firm should have minimum experience of Authority Engineer/Independent Engineer /Construction supervision/PMC of 2/4/6** - lanning/Bridge project of aggregate length equal to the indicative length of the package or more of similar category** for which RFP is invited. Firm should also have experience of Authority Engineer/Independent Engineer /Construction supervision/PMC of at least one project of similar category of 2/4/6** lanning/bridge work of minimum 40% of the indicative	

	length of the package.	

***Additional requirement in case of specialized projects if any may be added.**

(i) The sole applicant shall fulfill all the requirements given in Table-1.

(ii) In case of JV, the Lead Partner should fulfill at least 75% of all eligibility requirements and the other partner shall fulfil atleast 50% of all eligibility requirements.

(iii) If the applicant firm has / have prepared the DPR/FS/Supervisionprojects solely on its own, 100% weightage shall be given. If the applicant firm has prepared the DPR/FS/Supervision projects as a lead partner in a JV, 75% weightage shall be given. If the applicant firm have prepared the DPR/Supervision projects as the other partner (not lead partner) in a JV 50% weightage shall be given. If the applicant firm have prepared the DPR/FS/Supervision projects as an associate, 25% weightage shall be given.

(iv) Similar project means 2/4/6 lane as applicable for the project for which RFP is invited. For 2-lane projects experience of 4/6 lane also to be considered with a multiplication factor of 1.5. Experience of 4/6 lane shall be considered interchangeably for 4/6 laning projects. For 4/6 laning projects, experience of 2 lane will be considered with a multiplication factor of 0.4, but only for those 2 lane projects whose cost of consultancy services was more than Rs.1.0 crore for DPR/FS and Rs. 3.0 crore for supervision.

12.2 Second stage technical evaluation (Refer 5.2)

S.No.	Description	Marks
A1	Firm's Profile , turnover and professionals working with the firm	20
A2	Firm's relevant experience in last 7 years for DPR work	15
A3	Firm's relevant experience in last 7 years for Supervision work	15
B1	Material testing, survey & investigation, equipment and software proposed to be used for DPR work	10
B2	Experience in use of technology for road inspection in supervision work/quality/safety audit	10
C	Qualification and Relevant experience of the proposed key personnel	30
	Total	100

Further break-up of each criteria has been detailed out below:

A1. Firm's Profile , turnover and professionals working with the firm (20M)

1	**Specific experience of firms in terms of year**	**7**	
1.1	Less than 5 year		2.5
1.2	5 year to 15 year.		5.0
1.3	15 year to 25 year		6.0
1.4	More than 25 years		7.0
2	**Profile of the Firm**	**3**	
2.1	Partnership /others (Solo /Joint)		1.0
2.2	Private Limited Company and Joint applicant		1.5
2.3	Private Limited Company and sole applicant		2.0
2.4	Public Limited Company and Joint applicant		2.5
2.5	Public Limited Company and sole applicant		3.0
3	**Specific experience of firms in terms of turnover (Updated to the factor as per clause 1.3.2 of LOI)**	**6**	
3.1	Firm Average Turnover of last 5 years >10 but < 20 crore		4.0
3.2	Firm Average Turnover of last 5 years 20 - 50 crore		5.0
3.3	Firm's Average Turnover of last 5 years > 50 crore		6.0
4	**Highway Professionals * working with the firm**	**4**	
4.1	<10 nos.		0
4.2	10-20 nos.		2.0
4.3	> 20-30 nos.		3.0
4.4	> 30 nos.		4.0
***The professionals who possess degree in Civil Engineering/Transport Planning/Transport Economics/Traffic Management/Geology/Environment Science or Engineering and 8 years Experience in highway/bridge/tunnel with employment in the firm for more than one year. The current Employment Certificate/Pay roll details shall be uploaded by Key Personnel on INFRACON.**			

A2. Firm's relevant experience in last 7 years for DPR work (15 M)

For standard highways, the following is the break-up:

S.No.	Description	Maximum Marks	Sub-Marks
1	**Specific experience of the DPR consultancy related to the assignment**	**15**	
1.1	**Aggregate Length of DPR / Feasibility study of 2/4/ 6 lane projects**	**5**	
1.1.1	More than the indicative Length of the package applied for		3.75
1.1.2	More than 2 times the indicative length of the package applied for		4.5
1.1.3	More than 3 times the indicative length of the package applied for		5.0
1.2	**DPR for 2/4/6 laning projects each equal to or more than 40 % of indicative length of a package applied for (or Feasibility Study for 2/4/6 laning projects each equal to or more than 60 % of indicative length of a package applied for)**	**5**	
1.2.1	1 project		3.75
1.2.2	2 projects		4.5
1.2.3	≥3 projects		5.0
1.3	**DPR of Bridge having length more than 200 m**	**5**	
1.3.1	1 bridge		1.0
1.3.2	2 bridges		2.0
1.3.3	3 bridges		3.0
1.3.4	4 bridges		4.0
1.3.5	≥5 bridges		5.0

For special projects such as special bridges, tunnels and expressways that require specialized capabilities and skill sets, the following is the break-up:

S. No.	Description	Maximum Marks	Sub-Marks
1	**Specific experience of the DPR consultancy related to the assignment- Aggregate Length of DPR / Feasibility study of 2/4/ 6 lane projects**	**7**	
1.1	More than the indicative Length of the package applied for		5
1.2	More than 2 times the indicative length of the package applied for		6
1.3	More than 3 times the indicative length of the package applied for		7
2	**DPR for Bridge/tunnel/expressway of 2/4/6 laning projects each equal to or more than 40 % of indicative length of a package applied for (or Feasibility Study for 2/4/6 laning projects each equal to or more than 60 % of indicative length of a package applied for)**	**8**	
1.2.1	1 project		6
1.2.2	2 projects		7
1.2.3	≥ 3 projects		8

Note: In case feasibility study is a part of DPR services the experience shall be counted in DPR only. In case bridge is included as part of DPR of highway the experience will be (1) and (2)

A3: Firm's relevant experience in last 7 years for Supervision work (15 M).

S. No.	Description	Maximum Marks	Sub-Marks
1	Specific Experience as Authority Engineer/Independent Engineer /Construction supervision/PMC in aggregate length of HighwayProjects of 2/4/6-laning	**5**	
1.1	More than the indicative Length of the package applied for -		3.75
1.2	More than 2 times the indicative length of the package applied for		4.5
1.3	More than 3 times the indicative length of the package applied for-		5.0
2	Specific Experience as Authority Engineer/Independent Engineer /Construction supervision/PMC in Number of HighwayProjects of 2/4/6-laning**of length (40%of project length) or more in last 7 years.	**5**	
2.1	1 project		**3.75**
2.2	2 Project		**4.00**
2.3	3 Project		**4.25**
2.4	4 Project		**4.50**
2.5	5 Project or more		**5.00**
3	Experience in Construction Supervision of major structures having length of more than 200 meter in last 7 years.	**5**	
3.1	1 project		**3.75**
3.2	2 Project		**4.00**
3.3	3 Project		**4.25**
3.4	4 Project		**4.50**
3.5	5 Project or more		**5.00**
4	Additional requirement in case of specialized projects***	***	

Note 1: In case of JV the turnover and experience details of Lead and JV partners to be added.

Note 2: Employer's certificate/ certificate from Statutory Auditor should be submitted substantiating the experience/turnover claimed by the firm.

*** In case the project includes any specialized nature of work such as tunnels, specialized structures etc. in substantial quantum, this requirement/Marks may be included by suitably

adjusting marks of other attributes.

B1. Material testing, survey and investigation, equipment and software proposed to beused (10M)

S.No.	Description	Maximum Marks	Sub-Marks
1	**Availability of Material Testing Facilities with persons/resources having operational skills of the equipment**	**1.5**	
1.1	Owned* (Available In House)		1.5
1.2	Outsourced (Hire basis)		1
*** Shall be ascertained through the ownership evidence uploaded on INFRACON in regard to major equipments required for testing of materials to be used for construction of Highway Project.**			
2	**Availability of Field Investigation Facilities with persons/resources having operational skills of the equipment**	**1**	
2.1	Owned** (Available In House)		1
2.2	Outsourced (Hire basis)		0.5
**** Shall be ascertained through ownership evidence uploaded on INFRACON for construction of Highway Project.**			
3	**Availability of Office Equipment and Software with persons/resources having operational skills of the equipment**	**1.5**	
3.1	Owned*** (Available In House)		1.5
3.2	Outsourced (Hire basis)		1
***** Shall be ascertained through ownership evidence uploaded on INFRACON for key hardware/software required for Highway consultancy assignment.**			
4	**Experience in LiDAR or equivalant technology for topographic survey (Infrastructure sector)**	**2.5**	
4.1	1 project		0.5
4.2	2 projects		1
4.3	3 projects		1.5
4.4	4 projects		2
4.5	≥ 5 projects		2.5
5	**Experience in using GPR and Induction Locator or equivalant technologies for detection of sub-surface utilities (Infrastructure sector)**	**2**	
5.1	1project		0.5
5.2	2 projects		1
5.3	3 projects		1.5
5.4	≥ 4 projects		2
6	**Experience in digitization of cadastral maps for land surveys**	**1.5**	
6.1	Area upto 100 ha		0.5
6.2	Area between 100-500 ha		1
6.3	Area > 500 ha		1.5

Note: The experience of firm/associate in Lidar or equivalent technology, GPR and Induction Locator or equivalent technologies and Experience in digitization of cadastral maps for land acquisition shall be supported by experience certificate. The experience of a firm/associate in Lidar or equivalent technology, GPR and Induction Locator or equivalent technologies and

Experience in Digitization of cadastral maps for land acquisition for a private concessionaire/ contractor (client) shall be considered on self-certification along with the client certificate **of Government agencies not below the rank of EE/PD/GM or eqivalant officer.** Any false certification shall attract provisions of Clause 1.8, Section -2 (letter of Invitation) read with Clause 2.9.1(g) ofGCC

B2: Experience in use of technology for road inspection in supervision work (10M)

S. No	Description		Maximum Marks
1	Experience in Network Survey Vehicle(NSV) or **equivalant** technology for pavement inspection		3.5
1.1	Equipment		2
	(a) Equipment on MOU on hiring basis- 1 marks		
	(b) Own Equipment – 2 marks		
1.2	Experience		1.5
(i)	1-2 projects	0.5	
(ii)	3-5 projects	1	
(iii)	> 5 projects	1.5	
2	Experience in Falling Weight Deflectometer (FWD) or **equivalant** technology for pavement strength measurement		2
2.1	Equipment		1
	(a) Equipment on MOU on hiring basis- 0.5 mark		
	(b) Own Equipment – 1 marks		
2.2	Experience		1
(i)	1-3 Projects - 0.5 marks		
(ii)	>3 Projects- 1 marks		
3	Experience in Mobile Bridge Inspection Unit or better		2.5
3.1	Equipment		1
	(a) Equipment on MOU on hiring basis- 0.5 mark		
	(b) Own Equipment – 1 marks		
3.2	Experience		1.5
(i)	1-2 Projects- 0.5 marks		
(ii)	3-5 Projects- 1 marks		
(iii)	> 5 Projects- 1.5 marks		
4	Experience in Retro reflectometer technology		2
4.1	Equipment		1
	(a) Equipment on MOU on hiring basis- 0.5 mark		
	(b) Own Equipment – 1 marks		
4.2	Execution with owned/hired Equipment		1
(i)	1-3 Projects - 0.5 marks		
(ii)	>3 Projects – 1 marks		
	Total		10

Notes:

(i) The Consultants owning the equipment shall be required to submit proof of ownership.

(ii) The experience of firm/associate in NSV or equivalent technology, FWD or equivalent technology, MBIU or equivalent technology and Retro reflectometer or equivalent technology shall be supported by experience certificate. The experience of a firm/associatefor a private concessionaire/ contractor (client) shall be considered on self-certification along with the client certificate **of Government agencies not below the rank of EE/PD/GM or eqivalant officer.** Any false certification shall attract provisions of Clause 1.8, Section -2 (letter of Invitation) read with Clause 2.9.1(g) ofGCC

C. Qualification and relevant experience of the proposed key personnel (30M)

The weightage for various key staff is as under:

C-1 Normal Highway Project:

S.No.	Key personnel	Marks
1	Team Leader cum Senior Highway Engineer	10
2	Senior Bridge Engineer	8
3	Highway cum Pavement Engineer	6
4	Road/Traffic Safety Expert	6
	Total	30

C-2 Standalone Bridge Project:

S. No.	Key personnel	Marks
1	Team Leader cum Senior Bridge Engineer	10
2	Highway cum Pavement Engineer	8
3	Bridge Structural Engineer	6
4	Material cum Geotechnical Engineer -Geologist	6
	Total	30

C-3 Standalone Tunnel Project:

S. No.	Key personnel	Marks
1	Team Leader cum Senior Tunnel Expert	10
2	Tunnel Design Expert	8
3	Senior Geotechnical Engineer	6
4	Senior Geophysicist	6
	Total	30

The number of marks assigned during the evaluation of qualification and competence of key staff are as given below:

S.No.	Description	Maximum Marks	Sub-Marks
1	**General Qualification**	**25**	
1.1	Essential education qualification		20
1.2	Desirable education qualification		5
2	**Relevant experience and adequacy for the project**	**70**	
2.1	Total professional experience		15
2.2	Experience in Highway/Bridge/Tunnel Projects		25
2.3	Experience in Similar Capacity		30
3	**Employment with the Firm**	**5**	
3.1	Less than 1 Year		0
3.2	1 year		3
3.3	Add 0.5 marks for each subsequent year subject to maximum of 2 marks		

12.3 **Detailed evaluation criteria which is to be used for evaluation of technical bids is as indicated at Appendix-V.**

The Consultant should carryout self-evaluation based on the evaluation criteria at Appendix-V. While submitting the self-evaluation along with bid, Consultant shall make references to the documents submitted in their proposal which have been relied upon in self-evaluation Result of technical evaluation shall be made available on the website giving opportunity to the bidders to respond within 7 days in case they have any objection

12.4 **Third stage – Evaluation of Financial proposal**

Financial Proposals of all Qualified Consultants in accordance with clause 5.2 and 5.3 of Letter of Invitation shall be opened.

The consultancy services will be awarded to the consultant scoring highest marks in combined evaluation of Technical and Financial proposals in accordance with clause 1.3 and 5.4 hereof.

The Factors are:

The weight given to Technical Proposal (T) =0.80. The weight given to Financial Proposal (f) =0.20

13. The common currency is **"Indian Rupee".** (Ref. Para 3.3.3)

Consultant have to quote in Rupees both for domestic Consultant as well as Foreign Consultants

14. Commencement of Assignment (Date, Location): The Consultants shall commence the Services within fifteen days of the date of effectiveness of the contract at locations as required for the project stretch stated in TOR. (Ref. Para 1.2 of LOI and 2.3 of GCC/SC)

APPENDIX-IA

MANNING SCHEDULE for phase 1&2 (project preparation and pre-construction activity).

A. Normal Highway Projects

Sr. No	Key Personnel	Project Preparation **300 days**			Pre-construction activity 240 days		
		At site (man month)	At design office (man month)	Total Time Period (man month)	At site (man month)	At design office (man month)	Total Time Period (man month)
1	Team Leader Cum Senior Highway Engineer	5	4	9	5	3	8
2	Senior Bridge Engineer	2	3	5	0	0	0
3	Highway cum Pavement Engineer	2	3	5	0	0	0
4	Material-cum-Geo-technical Engineer – Geologist	4	2	6	0	0	0
5	Senior Survey Engineer	4	3	7	4	2	6
6	Road/Traffic Safety expert	2	2	4	0	0	0
7	Environmental Specialist	2	1	3	2	1	3
8	Quantity Surveyor / Documentation Expert	2	2	4	1	1	2
9	Land Acquisition Expert	4	2	6	5	3	8
10	Utility Expert	3	1	4	5	3	8
	Total	30	23	53	22	13	35

1. Consultants have to provide a certificate that all the key personnel as envisaged in the Contract Agreement have been actually deployed in the projects. They have to furnish the certificate at the time of submission of their bills to <Agency> from time to time.

2. The requirement of tunnel/s is to be assessed strictly as per site requirement during the detailed study after mobilisation of Consultant on site.

   In case Tunnels are to be constructed, necessary input of Tunnel Experts shall be provided in addition to above mentioned Manpower requirement.

   Tunnel expert, if required, the remuneration may be provided equivalent to Team Leader remuneration and time period shall be decided by Regional Officer, concerned, <Agency>.

3. The Consultant shall provide one Land Acquisition Expert along with allied team and supporting logistic as envisaged in Clause 5.1.5.1 of TOR for each 100 km stretches proposed for DPR preparation or part thereof

   If delay in LA process occurs beyond the reasonable control of consultant, the extension of LA team staff/s along with logistic support/transportation shall be granted by Nodal Project Director and beyond further 6 months, Regional Officer, <Agency> is empowered to grant extension to LA team staff/s.

B. Standalone Bridge Projects

Sr. No	Key Personnel	Total Project Assignment **300 days**		
		At site (man month)	At design office (man month)	Total Time Period (man month)
1	Team Leader cum Sr. Bridge Engineer	6	4	10
2	Highway cum Pavement Engineer	2	8	10
3	Senior Bridge Engineer	3	3	6
4	Material-cum-Geo-technical Engineer-Geologist	6	4	10
5	Senior Survey Engineer	2	4	6
6	Senior Geologist	3	3	6
7	Environmental Specialist	4	2	6
8	Quantity surveyor /Documentation Expert	2	2	4
	Total	**28**	**30**	**58**

C. Standalone Tunnel Projects

Sr. No	Key Personnel	Total Project Assignment **300 days**		
		At site (man month)	At design office (man month)	Total Time Period (man month)
1	Team Leader Cum Senior Tunnel Engineer	6	4	10
2	Tunnel Design Expert	2	8	10
3	Senior Geophysicist	3	3	6
4	Senior Geotechnical Engineer	6	4	10
5	Senior E& M Expert	2	4	6
6	Senior Geologist	6	4	10
7	Senior Survey Engineer	4	2	6
8	Environmental Specialist	2	2	4
9	Material Engineer			6
10	Highway cum Pavement Engineer			4
11	Quantity Surveyor/DocumentationExpert			4
	Total	**31**	**31**	**76**

Note: In case of standalone bridge project and standalone tunnel project phase-2 i.e. pre construction activity may not be required. In case phase 2 is required, the requirement of appropriate key personnel may be provided in the RFP.

MANNING SCHEDULE for phase 3 (Construction supervision and maintenance work).

A. Normal Highway Project (For projects with length 0-60 km)

S. No.	Key Personnel	Man-month in Construction Period of 18 months	Man-month in Defect Liability Period of 60 months
A: Key Personnel			
1	Team Leader Cum Senior Highway Engineer	18	15
2	Resident cum Highway Engineer	18	60
3	Senior Bridge Engineer	18	10
4	Highway cum Pavement Engineer	18	0
5	Senior Quality cum Material Expert	18	0
6	Road/Traffic Safety expert	6	10
	Sub Total	**96**	**95**
	Total for Construction and Maintenance	**191**	
B: Sub Professional Staff			
	Survey Engineer	18	10
	Assistant Highway Engineer (2 nos.)	2 x18	1x60
	CAD Expert	4	4
	Environmental Engineer	4	0
	Assistant Bridge Engineer	18	0
	Assistant Quality cum Material Engineer (2 Nos)	2x18	0
	Electrical Engineer	4	3
	HTMS/Toll expert	2	0
	Quantity surveyor	18	8
	Horticulture cum Landscaping Expert	6	18
	Sub Total	**146**	**103**
	Total for Construction and Maintenance	**249**	
Grand Total		**440**	

Note:

1. The other inputs like support staff shall be provided by the Consultant of an acceptable type commensurate with the roles and responsibilities of each position
2. In case of project having different construction period, Man Month Input shall be adjusted proportionately
3. The Financial Expert or Legal expert or Contract Specialist may be required for the project for specific needs. Their deployment shall be arranged by the Consultant on specific requisition from the Authority and the payment shall be made as per the actual deployment. The Financial Expert or Legal expert or Contract Specialist shall be paid at the rates quoted for Senior Pavement Specialist.

B. Normal Highway Project (For projects with length more than 60 km)

S. No.	Key Personnel	Man-month in Construction period of 24 months	Man-month in Defect Liability Period of 60 months
A: Key Personnel			
	Team Leader Cum Senior Highway Engineer	24	15
	Resident cum Highway Engineer (2 nos)	2x24	1x60
	Senior Bridge Engineer	24	15
	Highway cum Pavement Engineer	24	0
	Senior Quality cum Material Expert	24	0
	Road/Traffic Safety expert	8	15
	Sub Total	**152**	**105**
	Total for Construction and Maintenance	**257**	
B: Sub Professional Staff			
	Survey Engineer (2 nos)	2x24	1x10
	Assistant Highway Engineer (3 nos)	3x24	1x60
	CAD Expert	8	4
	Environmental Engineer	6	0
	Assistant Bridge Engineer (2 nos)	2 x 24	0
	Assistant Quality cum Material Engineer (3 nos)	3 x 24	0
	Electrical Engineer	4	3
	HTMS/Toll Expert	3	0
	Quantity Surveyor	24	8
	Horticulture cum Landscaping Expert	8	28
	Sub Total	**293**	**113**
	Total for Construction and Maintenance	**406**	
Grand Total		**663**	

Note:

1. The other inputs like support staff shall be provided by the Consultant of an acceptable type commensurate with the roles and responsibilities of each position
2. In case of project having different construction period, Man Month Input shall be adjusted proportionately
3. The Financial Expert or Legal expert or Contract Specialist may be required for the project for specific needs. Their deployment shall be arranged by the Consultant on specific requisition from the Authority and the payment shall be made as per the actual deployment. The Financial Expert or Legal expert or Contract Specialist shall be paid at the rates quoted for Senior Pavement Specialist.

C. Standalone Bridge Project

S. No.	Key Personnel	Man-month in Construction Period of 36 months	Man-month in Defect Liability Period of 60 months
A: Key Personnel			
1	Team Leader Cum Senior Bridge Engineer	36	15
2	Resident cum Pavement Specialist	36	60
3	Senior Bridge Engineer	36	15
4	Senior Contract Specialist	10	0
5	Senior Quality cum Material Expert	36	0
6	Road/Traffic Safety expert	12	10
	Sub Total	**166**	**100**
	Total for Construction and Maintenance	**266**	
B: Sub Professional Staff			
A			
B			
C			
	Sub Total		
	Total for Construction and Maintenance		
Grand Total			

Note: The number of key personnel may be modified as per the requirement with the approval of Competent Authority.

D. Standalone Tunnel Project

S. No.	Key Personnel	Man-month in Construction period of 60 months	Man-month in Defect Liability Period of 60 months
A: Key Personnel			
1.	Team Leader Cum Senior Tunnel Expert	60	15
2.	Resident cum Excavation Specialist	60	60
3.	Senior Geotechnical Expert	60	0
4.	Tunnel Design Engineer	60	0
5.	Tunnel Safety Expert	60	5
6.	Senior Contract Specialist	10	0
7.	Senior Geologist	20	0
	Sub Total	**330**	**80**
	Total for Construction and Maintenance	**410**	
B: Sub Professional Staff **(To be decided by the Authority as per requirement of the Project at the time of preparation of RFP)**			
	Sub Total		
	Total for Construction and Maintenance		
Grand Total			

Note: The number of key personnel may be modified as per the requirement with the approval of Competent Authority.

APPENDIX-IB

Qualification and Experience Requirement of Key Personnel for Phase 1 & 2

TEAM LEADER CUM SENIOR HIGHWAY ENGINEER

i)	**Educational Qualification**	
	Essential	Graduate in Civil Engineering or equivalent as approved by AICTE
	Desirable	**Post graduate in Civil Engineering (highways / structures / traffic and transportation / soil mechanics and foundation engineering/ Construction Management /Transportation) {AICTE Approved}**
ii)	**Essential Experience**	
	a)Total Professional Experience	Min. 15 years
	b) Experience in Highway projects	Min. 6 years in Planning, project preparation and design of **Highway projects**, including 2/4/6 laning of NH/SH/ expressways. The person should also 6 years experience in construction/construction supervision. For hill roads, respective hill roads experience is required
	c) Experience in similar capacity (Either as Team Leader or in Similar capacity)	In Feasibility/DPR of two / Four/Six Laning works of major highway projects (NH/SH/Expressways) of minimum aggregate length of 40 km AND IC/ Construction Supervision of Two/Four/six laning of major highway projects (NH/SH/Expressways) of minimum aggregate length of 40 km. For hill roads, respective hill roads experience is required.
iii)	Age Limit	65 years on the date of submission of proposal

SENIOR BRIDGE ENGINEER

i)	**Educational Qualification**	
	Essential	Graduate in Civil Engineering or equivalent
	Desirable	**Masters in Bridge Engineering / Structural Engineering**
ii)	**Essential Experience**	
	a)Total Professional Experience	Min. 10years
	b) Experience in Bridge projects	Min. 08 years in project preparation and design of bridge projects.
	c) Experience in similar capacity	Bridge Engineer in highway design consultancy projects (2/4/6 lane NH/SH/ Expressways) involving design of minimum two major bridges (length more than 200 m)
iii)	**Age Limit**	65 years on the date of submission of Proposal

HIGHWAY CUM PAVEMENT ENGINEER

i)	**Educational Qualification**	
	Essential	**Degree in Civil Engineering**
	Desirable	**Masters in highway engineering/Transportation Engineering**
ii)	**Experience**	
	a)Total Professional Experience	Min. 08 years
	b) Experience in Highway projects	Minimum 06 years' experience in pavement design and maintenance of NH/SH/Expressways.
	c) Experience in similar capacity	Pavement design for major highway projects (2/4/6 lane NH/SH/Expressways) of minimum aggregate length of 80 km.
iii)	**Age Limit**	65 **years on the date of submission of Proposal**

ROAD/ TRAFFIC SAFETY EXPERT

i)	**Educational Qualification**	
	Essential	Graduate in Civil Engineering
	Desirable	**Masters in Traffic Engineering /Transportation Engineering / TransportPlanning**
ii)	**Essential Experience**	
	a)Total Professional Experience	Min. 06 years
	b) Experience in Highway projects	Min. 05 years on similar projects of NH/SH/Expressways
	c) Experience in similar capacity	Traffic Engineer in highway Projects (NH/SH/Expressways) involving 2/4/6 laning of minimum aggregate length of 80 km.
iii)	**Age Limit**	65 **years on the date of submission of Proposal**

MATERIAL ENGINEER – CUM – GEOTECHNICAL ENGINEER CUM GEOLOGIST

i)	**Educational Qualification**	
	Essential	Graduate in Civil Engineering or M.Sc. Geology
	Desirable	**Masters in Foundation Engineering / Soil Mechanics / Phd in Geology /Geo Tech Engineering**
ii)	**Essential Experience**	
	a)Total Professional Experience	Min. 10years
	b) Experience in Highway Projects	Min.7 years on similar projects in design and/or construction
	c) Experience in similar capacity	Material cum Geo-technical Engineer on highway projects (2/4/6 lane NH/SH/Expressways) of minimum aggregate length of 80 km.
iii)	**Age Limit**	65 **years on the date of submission of Proposal**

SENIOR SURVEY ENGINEER

i)	**Educational Qualification**	
	Essential	Graduate or equivalent in Civil Engineering or Diploma in Civil Engg or Diploma in Surveying
	Desirable	**Masters in Survey Engineering/ Surveying / Remote Sensing**
ii)	**Essential Experience**	
	a) Total Professional Experience	Min. 10 years
	b) Experience in Highway projects	Min. 8 years on similar projects in project preparation and construction & thorough understanding of modern computer based methods of surveying
	c) Experience in similar capacity	Survey Engineer for projects preparation of highway project (NH/SH/Expressways) involving 2/4/6- laning of minimum aggregate length of 80 km.
iii)	**Age Limit**	**65 years on the date of submission of Proposal**

ENVIRONMENTAL SPECIALIST

i)	**Educational Qualification**	
	Essential	Graduate in Civil Engineering / Environment Engineering / Masters in Environment Science
	Desirable	**Post Graduate in Environmental Engineering**
ii)	**Essential Experience**	
	a) Total Professional Experience	Min. 06 years
	b) Experience in Highway Projects	Min. 5 years in environment impact assessment and permitting of highway projects (2/4/6 laning)
	c) Experience in similar capacity	Environmental Specialist in at least two highway projects (2/4/6 laning)
iii)	**Age Limit**	**65 years on the date of submission of bid**

QUANTITY SURVEYOR/DOCUMENTATION EXPERT

i)	**Educational Qualification**	
	Essential	Graduate or equivalent in Civil Engineering / Certificate course from 'Institution of Quantity Surveying'
	Desirable	
ii)	**EssentialExperience**	
	a)Total Professional Experience	Min. 10years
	b) Experience in Highway Projects	Min. 8 years in Preparation of Bill of Quantities, Contract documents and documentation for major highway projects involving two/ four laning
	c) Experience in similar capacity	Quantity Surveyor / Documentation Expert in highway projects (NH/SH/Expressways) involving two/four/six laning of minimum aggregate length of 80 km.
iii)	**Age Limit**	**65 years on the date of submission of Proposal**

LAND ACQUISITION EXPERT

i)	Educational Qualification	
	Essential	Graduate or equivalent
ii)	Essential Experience	
	a) Total Professional Experience	15 years as Deputy-Tehsildar or above Desirable: Ex- revenue officers like Ex-ADM/SDM, Ex-Tehsildar, Ex-Deputy-Tehsildar etc.
	b) Role specific experience	Min 10 years in Land acquisition for government/ authority projects
iii)	Age Limit	65 years on the date of submission of bid

UTILITY EXPERT

i)	Educational Qualification	
	Essential	Graduate or equivalent in major engineering disciplines viz. mechanical/ electrical/ civil engineering
ii)	Essential Experience	
	a) Total Professional Experience	Min 10 years Desirable: Ex- officers or engineers from utility agencies
	b) Role specific experience	Min. 8 years in Utility estimation and relocation/ erection of electric/ gas/ other utilities Desirable: Experience with utilities along the highway/road.
iii)	Age Limit	65 years on the date of submission of bid

TEAM LEADER CUM SENIOR BRIDGE ENGINEER

i)	**Educational Qualification**	
	Essential	Graduate in Civil Engineering or equivalent as approved by AICTE
	Desirable	**Post graduate in Structural Engineering, Degree/Diploma/Certificate in Project Management**
ii)	**Essential Experience**	
	a)Total Professional Experience	Min. 15 years
	b) Experience in Bridge projects	Min. 5 years in major Bridge Design/Construction/Development project.
	c) Experience in similar capacity (Either as Team Leader or in Similar capacity)	He should have handled as Team Leader/Project Manager or similar capacity of at least Two projects each in design and supervision of atleast two major bridge of a length 500 mtr. (Excluding approaches)
iii)	**Age Limit**	**65 years on the date of submission of proposal**

BRIDGE/STRUCTURAL ENGINEER

i)	**Educational Qualification**	
	Essential	Graduate in Civil Engineering or equivalent
	Desirable	**Masters in Bridge Engineering / Structural Engineering**
ii)	**Essential Experience**	
	a)Total Professional Experience	Min. 8 years
	b) Experience in Bridge projects	Min. 05 years in project preparation and design of bridge projects.
	c) Experience in similar capacity	Bridge Engineer in highway design consultancy projects (2/4/6 lane NH/SH/ Expressways) involving design of minimum two **major bridges** (length more than 200 m)
iii)	**Age Limit**	65 **years on the date of submission of Proposal**

TEAM LEADER CUM SENIOR TUNNEL EXPERT

I	**Educational Qualification**	
	Essential	Graduate in Civil Engineering/Tunnel Engineering/Mining Engineering
	Desirable	Post Graduate in Civil Engineering/Tunnel Engineering/Mining Engineering
II	**Essential Experience**	
a)	Total Professional Experience	Min. 20 years
b)	Experience in Tunnel projects	(i) Professional experience of min 12 years in handling major tunnel projects (Road/Rail/Metro)
		(ii) Experience of min 6 years in major tunnel construction/construction supervision projects (Road/Rail/Metro)
		(iii) Experience min 6 years in reviewing of DPR or Feasibility report of major tunnel projects (Road/Rail/Metro)
		(iv) Experience in DPR reviewing of minimum 1 km Tunnel length
		(v) Experience in construction/construction supervision/ reviewing of DPR/feasibility report of major tunnel projects (Road/Rail/metro) using NATM
c)	Experience in similar capacity	(i) Experience as Team Leader or similar capacity in major tunnel construction/construction supervision projects (Road/Rail/Metro)

		(ii) Experience as Team Leader or similar capacity in reviewing of DPR or Feasibility report of major tunnel projects (Road/Rail/Metro)
III	**Age Limit**	65 years on the date of submission of proposal

TUNNEL DESIGN EXPERT

I	**Educational Qualification**	
	Essential	Degree in Civil/ Mining Engineering
	Desirable	Post Graduation in Design/ Structural Engineering or equivalent.
II	**Essential Experience**	
	a)Total Professional Experience	Min. 15 years
	b) Experience in Tunnel projects	(i) Professional Experience in handling major tunnel projects (Road/Rail/Metro)
		(ii) Experience of major tunnel construction/construction supervision projects (Road/Rail/Metro)
		(iii) Experience in preparation of DPR or Feasibility report of major tunnel projects (Road/Rail/Metro)
	c) Experience in similar capacity	(i) Professional Experience as Tunnel Design Engineer (Structural)
		(ii) Experience as Tunnel Design Engineer (Structural) of major tunnel construction/construction supervision projects (Road/Rail/Metro)
		(iii) Experience as Tunnel Design Engineer (Structural) of major tunnel for preparation of DPR projects (Road/Rail/Metro)
		(iv)Experience as Tunnel Design Engineer (Structural) in preparation of DPR/ Feasibility report of major tunnel projects (Road/Rail/Metro) using NATM
III	**Age Limit**	65 years on the date of submission of Proposal

SENIOR GEOTECHNICAL ENGINEER

I	**Educational Qualification**	
	Essential	Civil Engineering/Mining Engineering / Engineering Geology
	Desirable	Geotechnical Engineering /Foundation Engineering/Rock Mechanics/Geo science or equivalent
II	**Essential Experience**	
	a) Total Professional Experience	Min. 15 years
	b) Experience in Tunnel Projects	(i) Professional experience in handling major tunnel projects (Road/Rail/Metro)
		(ii) Experience in major tunnel construction/construction supervision projects (Road/Rail/Metro)
		(iii)Experience in preparation of DPR or Feasibility report of major tunnel projects (Road/Rail/Metro)
	c) Experience in similar capacity	(i) Professional Experience as Senior Geotechnical Engineer
		(ii) Experience as Senior Geotechnical Engineer or similar capacity in major tunnel construction/construction supervision projects (Road/Rail/Metro)
		(iii) Experience as Senior Geotechnical Engineer or similar capacity inpreparation of DPR or Feasibility report of major tunnel projects(Road/Rail/Metro)
		(iv) Experience as Senior Geotechnical Engineer or similar capacity inpreparation of DPR/ Feasibility report of major tunnel projects (Road/Rail/Metro) using NATM
III	**Age Limit**	65 years on the date of submission of proposal

SENIOR GEOPHYSICIST

I	**Educational Qualification**	
	Essential	Graduate in Geophysics/Geo science/ Earth science or equivalent.
	Desirable	Post Graduation in Geophysics/Geo science/ Earth science or equivalent
II	**Essential Experience**	
	a) Total Professional Experience	Min. 15 years
	b) **Experience in Relevant works**	(i) Professional Experience in handling tunnel/ mineral and oil exploration projects
		(ii) Experience of carrying out AEM survey for tunneling/ mineral and oil exploration or any other similar work for area of more than 2.7 sq km
		(iii) Processing, Interpreting, generating 3D resistivity model of AEM survey's raw data for tunneling/ mineral and oil exploration or any other similar work for area of more than 2.7 sq km
		(iv) Experience in carrying out AEM survey, processing, interpreting, generating 3D resistivity of AEM survey's raw data for major tunnel work (Rail/Road/Metro)
III	**Age Limit**	65 years on the date of submission of proposal

SENIOR GEOLOGIST

i)	**Educational Qualification**	
	Essential	Post Graduate Degree in Geology/Related field.
	Desirable	Phd in Geology/Related fields.
ii)	**Essential Experience**	
	a)Total Professional Experience	Min. 15 years
	b) Experience in Tunnel projects	He should have a minimum 10 years of professional experience and should have involved in project preparation/ DPR/ Tunnel Design for atleast two major Tunnel projects.
	c) Experience in similar capacity	He should have experience in similar capacity per five years on Design/ Construction/ Supervision of Tunnel Projects. The minimum cost of the project handled in the similar capacity should be 2500 Millions
iii)	**Age Limit**	**65 years on the date of submission of Proposal**

SENIOR E&M EXPERT

i)	**Educational Qualification**	
	Essential	Degree in Electrical/Mechanical Engineering.
	Desirable	Post Graduation in Degree in Electrical/Mech Engineering.
ii)	**Essential Experience**	
	a) Total Professional Experience	Min. 15 years
	b) Experience in Tunnel projects	10 years in Tunnel Projects and should have worked for atleast five years as an E&M Expert for Tunnel Design/ Construction projects.
	c) Experience in similar capacity	He should have handled atleast two tunneling projects in similar capacity.
iii)	**Age Limit**	**65 years on the date of submission of Proposal**

MATERIAL ENGINEER

i)	**Educational Qualification**	
	Essential	Graduate in Civil Engineering/Material Science and Engineering or equivalent
	Desirable	Post-graduation in Material Science and Engineering or equivalent
ii)	**Essential Experience**	
	a) Total Professional Experience	**Min. 15 years**
	b) Experience in Highway Projects	Minimum 8 years on Tunnel projects in design and /or construction. Experience on Tunnel projects shall be preferred.
	c) Experience in similar capacity	Material Engineer on highway projects (2/4/6 lane NH/SH/Expressway) of minimum aggregate length of 80 km.
iii)	**Age Limit**	**65 years on the date of submission of proposal**

QUALIFICATION AND EXPERIENCE REQUIREMENT OF KEY PERSONNEL FOR PHASE 3

RESIDENT CUM HIGHWAY ENGINEER

The expert shall be continuously interacting with the Concessionaire, for the review of highway designs and drawings using sophisticated computer software and also construction and O&M works and to ensure life cycle cost effectiveness and viable design of pavement including appropriate rehabilitation / strengthening of the existing pavement. He shall also be responsible for ensuring complete adherence to maintenance standards during Construction and Operation period. Thus, the position requires a pavement specialist with thorough knowledge and understanding of international 'best practices' in the field of Design, Construction and maintenance of flexible/rigid type of pavements including latest Codal stipulations andspecifications.

He should have the following qualification / experience.

2. Essential Qualifications.

a) Graduate in Civil Engineering from a recognized University.

b) Professional Experience of at least 12years

c) Experience of at least 5 years in similar capacity in Construction / Construction Supervision of 2/4/6 laning** of major highway projects.

d) Experience in similr capacity in handling at least 2 major highway projects (of length 40% of project length or more of similar configuration (2/4/6 laning**) and above).

e) Not more than 65 years of age

3. Preferential Qualifications.

Post Graduate Degree in Highway Engineering / Construction Management / Geotechnical Engineering / Transportation Engineering / Structural Engineering

Experience in similar capacity in Highway project construction/ construction supervision on EPC mode (of length 40% of project length or more of similar configuration (2/4/6 laning**) andabove).

SENIOR BRIDGE ENGINEER

The Bridge & Structural Engineer shall be responsible for checking the designs of bridges, ROBs, interchanges and any other structure to be constructed in the Project highway and supervising the works of bridges, interchanges and any other structure to be constructed by the Concessionaire for this project. He shall also inspect the bridge rehabilitation and repair works to be undertaken by the Concessionaire. He should have thorough understanding and experience with international `best practices' of modern bridge construction technology.

He should have the following qualification / experience.

1. **Essential Qualifications.**
   a) Graduate in Civil Engineering from a recognized University.
   b) Professional Experience of at least 10 years in handling Highway/Bridge projects. At least 5 years experience in Construction / Construction Supervision of bridge / interchange / any other structures.
   d) Experience in similar capacity in supervision of at least 2 Major Highway Bridges.
   e) Experience in supervision of Rehabilitation and repair of 2 nos Major Bridges.
   f) Not more than 65 years of age.
2. **Preferential Qualifications.**
   a) Post Graduate Degree in Structural Engineering.
   b) He should have thorough understanding and experience of modern bridge construction technology. viz., Precast Segmental, Balanced Cantilever Construction, Extradosed Bridge, Full Span Launching, Incremental Launching

HIGHWAY CUM PAVEMENT ENGINEER

The expert shall be continuously interacting with the Concessionaire, for the review of highway designs and drawings using sophisticated computer software and also construction and O&M works and to ensure life cycle cost effectiveness and viable design of pavement including appropriate rehabilitation / strengthening of the existing two lane pavement which is significantly distressed. He shall also be responsible for ensuring complete adherence to maintenance standards during Construction and Operation period. Thus, the position requires a pavement specialist with thorough knowledge and understanding of international 'best practices' in the field of Design, Construction and maintenance of flexible/rigid type of pavements including latest Codal stipulations and specifications.

He should have the following qualification / experience.

1. **Essential Qualifications.**
   a) Graduate in Civil Engineering from a recognized University.
   b) Professional Experience of at least 10 years in Pavement Design / Pavement Construction / Pavement Maintenance of Highways / Roads / Airfield Runways

c) Experience of at least 5 years in similar capacity in Construction / Construction Supervision of 2/4/6 laning** of major highway projects.

d) Experience as Pavement Specialist / Pavement Engineer in Construction / Construction Supervision of at least 2 major highway projects (of length 40% of project length or more of similar configuration (2/4/6 laning**) and above).

2. Preferential Qualifications.

a) Post Graduate Degree in Highway Engineering / Pavement Engineering /Transportation Engineering

b) Experience as a Pavement Specialist/Pavement Engineer in Highway EPC project (of length 40% of project length or more of similar configuration (2/4/6 laning**) and above).

SENIOR CONTRACT SPECIALIST

Duties: He will be deployed in working season in stages for cumulative duration of period mentioned in Enclosure-A for obtaining his expert opinion on emerging contractual issues. His key responsibilities will be to guide and assist Team Leader/Employer in all aspects of contract management in proper implementation of contract provisions including controlling the project cost of the construction package. He will also be required to offer his advice on contractual complications arising during the implementation as per the request of the employer. He will be required to prepare manuals/schedules for the consultants team/employer based on the provisions of the contract document. He will be responsible for giving appropriate suggestions in handling claims of the contractors and any dispute arising thereof.

(1) Essential Qualifications.

a) Graduate in Civil Engineering from a recognized University.

b) Professional Experience of 15 years in Contract Management.

c) Experience of at least 4 years as Contract Specialist on any National/State Highway project/Bridge Project.

d) Contract Management of a large Highway/Bridge contract say over Rs. 150 crore including experience of handling Variation orders, claims of the contractor and there appropriate disposal for at least 2projects.

e) Handled at least one Arbitration cases in respect of any Highway/Bridgeprojects.

f) *Not more than 65 years of age.*

(2) Preferential Qualifications.

(a) Degree in Law/PG in management/certificate course in management/ certificate course in construction management/certificate course in contract management.

ROAD/TRAFFIC SAFETY EXPERT

Shall be responsible for the overall Road/Traffic Safety Aspect of the Project. He shall ensure that safety provisions as per relevant codes are strictly followed at site during Construction of Road and also during the Maintenance Period

1. **Essential Qualifications.**
   a) Graduate in Civil Engineering from a recognized University.
   b) Professional Experience of at least 10 years in handling Highway projects.
   c) Minimum 5 years experience in Road Safety works of Major Highway Projects (4/6 laning projects)
   d) Experience in similar capacity in Road Safety Audit of at least 2 nos. 2/4/6 lane** highway / expressway project including 1 nos. at design stage
   e) Experience in similar capacity in the field of Road Safety Management Plan.
   f) Not more than 65 years of age.

2. **Preferential Qualifications**
   a) Post Graduate Degree in Traffic Transportation/Safety Engineering.
   b) Experience in similar capacity in identification and improvement of black spots on Major Highway Project.
   c) Experience in similar capacity in Preparation of Road Safety Management Plan for inter urban Highways.

Senior Quality cum Material Expert

The Quality/Material Expert shall review the test results of bore holes, quarry and borrow area material to find out their strength characteristics and suitability for using them in construction. He shall inspect the Concessionaire's field laboratories to ensure that they are adequately equipped and capable of performing all the specified testing requirements of the contract. He shall look into the quality assurance aspect of the construction works and supervise the setting-up of the various Concessionaire's rock crushers and bituminous mixing plants to ensure that the specified requirements for such equipment are fully met. Experience in latest Quality Management techniques in highway projects shall have added advantage.

He should have the following qualification / experience.

1. **Essential Qualifications.**
   a) Graduate in Civil Engineering from a recognized University.
   b) Professional Experience of at least 10 years in handling Highway projects.
   c) Experience of at least 5 years as Senior Quality/ Material Expert or in similar capacity in Construction / Construction Supervision /major highway projects
   d) Experience as Senior Quality/ Material Expert or in similar capacity in handling of at least 2 similar highway projects (of length 40% of project length or more of

similar configuration (2/4/6 laning**) and above)

e) Not more than 65 years of age.

2. Preferential Qualifications.

Post Graduate Degree in Geotechnical Engineering / Foundation Engineering / Soil Mechanics.

Senior Geo Technical Engineer

Duties: He will be responsible for supervising all the tests to be done in different stages of construction, besides ensuring that specified tests are done as per codal stipulations and as per the specifications laid down in the contract for all the different stages of construction. The Senior Geotechnical Engineer shall be responsible for checking and verifying the Specifications for Geotechnical investigations and the geotechnical details submitted by the Contractor. He shall assist the Team Leader & Tunnel Design Engineer in design of tunnel. He shall monitor the tunnel excavation activities including blasting

He should have the following qualification / experience.

(1) Essential Qualifications.

a) Graduate in Civil Engineering/masters in engineering geology or equivalent from a recognized University.
b) Professional Experience of at least 20 years
c) Experience of at least 10 years in Construction / Construction Supervision of transportation tunnel projects in developed countries
d) Experience as Geotechnical Engineer in Construction/Construction Supervision of at least 4 transportation Tunnel projects of length equal to or more than 4Km
e) Specific experience in construction of tunnel projects involving vertical shaft sinking of at least 200 meter of vertical depth
f) Experience in similar capacity in project preparation of at least 2 transportation tunnel projects each of minimum 4 Km in length
g) Not more than 65 years of age.

2) Preferential Qualifications.

Post Graduate in Rock Mechanics/ Foundation Engineering/ Tunnel Engineering

SUB-PROFESSIONAL

SURVEY ENGINEER

The candidate should be Diploma in Civil Engineering Firm may field Survey Engineer with diploma in Civil Engineering/Survey having atleast 5 years experience in the field of surveying out of which atleast 3 years should be in highway projects and they should have also dealt with at least 1 project of similar nature. This position requires thorough understanding of modern computer based method of surveying with total station digital level etc.

ASSISTANT HIGHWAY ENGINEER

The Candidate should be Diploma in Civil Engineering.

CAD EXPERT

He should be Diploma in Civil Engineering/Computer Science having experience in computer related design method for highway engineering.

ENVIRONMENTAL ENGINEER

The Candidate should be Diploma in Civil Engineering/Environmental Engineering or other relevant qualification. He should have at least 6 years experience out of which 2 years in highway projects. He should have good knowledge of MOEF guidelines/requirements for mitigation measures.

ASSISTANT BRIDGE ENGINEER

The Candidate should be Graduate in Civil Engineering with 3 years experience. He should have handled at least 1 major bridge project.

ASSISTANT QUALITY CUM MATERIAL ENGINEER

The Candidate should be Graduate in Civil Engineering or diploma in Civil Engineering with 3 years experience.

ELECTRICAL ENGINEER

The Candidate should be Diploma in Electrical Engineering from recognised institute. He should have at least 6 years experience

QUANTITY SURVEYOR

He should be Diploma or equivalent in Civil Engineering having Min. 5 years of professional experience in preparation of highway project estimates. He should have Min. 3 years experience in Preparation of Bill of Quantities/estimates for major highway projects costing Rs.100 Crore or above.

HORTICULTURE CUM LANDSCAPING SPECIALIST

He should be a Diploma / Graduate in Agriculture with specialization in Horticulture / Arboriculture having minimum 5 year of field experience in Horticulture / Arboriculture and landscaping. He should have minimum 5 years field experience.

Note: Upto 2 sub-professional can be a fresh graduate (zero/ less than minimum required work experience) with first class in graduation stream. Eligibility requirement in terms of minimum years of experience shall not be applicable for this sub professional.

APPENDIX-II

Proof of Eligibility

Form-E1

Letter of Proposal (On Applicant's letter head)

(Date and Reference)

To, **********

****

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Sub: Appointment of Consultant for Project Management Consultancy for ……..

Dear Sir,

With reference to your RFP Document dated ……., I/we i.e M/s----------(Name of Bidder) having examined all relevant documents and understood their contents, hereby submit our Proposal for selection as Consultant. The proposal is unconditional and unqualified.

2. All information provided in the Proposal uploaded on INFRACON and in the Appendices **is true** and correct and all documents accompanying such Proposal are true copies of their respective originals.

3. This statement is made for the express purpose of appointment as the Consultant for the aforesaid Project.

4. I/We shall make available to the Authority any additional information it may deem necessary or require for supplementing or authenticating the Proposal.

5. I/We acknowledge the right of the authority to reject our application without assigning any reason or otherwise and hereby waive our right to challenge the same on any account whatsoever.

6. I/We certify that in the last three years, we or any of our Associates **have neither failed to perform on any contract,** as evidenced by imposition of a penalty by an arbitral or judicial authority or a judicial pronouncement or arbitration award against the Applicant, **nor been expelled from any project or contract by any public authority** nor have had any contract terminated by any public authority for breach on our part.

7. I/We understand that you may cancel the Selection Process at any time and that you are neither bound to accept any Proposal that you may receive nor to select the Consultant, without incurring any liability to the Applicants in accordance with Clause 1.7 of the RFP document.

8. I/We declare that we/any member of the consortium, are/is not a Member of any other Consortium applying for Selection as a Consultant.

9. I/We certify that in regard to matters other that security and integrity of the country, we or any of our Associates have not been convicted by a Court of Law or indicted or adverse orders passed by a regulatory authority which would cast a doubt on our

ability to undertake the Consultancy for the Project or which relates to a grave offence that outrages the moral sense of the community.

10. I/We further certify that in regard to matters relating to security and integrity of the country, we have not been charge-sheeted by any agency of the Government or convicted by a Court of Law for any offence committed by us or by any of our Associates.

11. I / We further certify that no investigation by a regulatory authority is pending either against us or against our Associates or against our CEO or any of our Directors / Managers / employees.

12. I/We hereby irrevocably waive any right or remedy which we may have at any stage at law or howsoever otherwise arising to challenge or question any decision taken by the Authority [and/ or the Government of India] in connection with the selection of Consultant or in connection with the Selection Process itself in respect of the above mentioned Project.

~~13. Deleted.~~

14. I/We agree and understand that the proposal is subject to the provisions of the RFP document. In no case, shall I/we have any claim or right of whatsoever nature if the Consultancy for the Project is not awarded to me/us or our proposal is not opened or rejected.

15. I/We agree to keep this valid for 120 (One hundred and twenty) days from the Proposal Due Date specified in the RFP.

16. A Power of Attorney in favor of the authorized signatory to sign and submit this Proposal and documents is attached herewith.

17. In the event of my/our firm/consortium being selected as the Consultant, I/we agree to enter into any Agreement in accordance with the form Appendix V of the RFP. We agree not to seek any changes in the aforesaid form and agree to abide by the same.

18. I/We have studied RFP and all other documents carefully and also surveyed the Project site. We understand that except to the extent as expressly set forth in the Agreement, we shall have no claim, right or title arising out of and documents or information provided to us by the Authority or in respect of any matter arising out of or concerning or relating to the Selection Process including the award of Consultancy.

19. The Proof of Eligibility and Technical proposal are being submitted in separate covers in hard copy (as per clause 4.1 of LoI) and INFRACON Team I.D no._____. Financial Proposal is being submitted online only. This Proof of Eligibility read with Technical Proposal and Financial Proposal shall constitute the Application which shall be binding on us.

20. I/We agree and undertake to abide by all the terms and conditions of the RFP Document. In witness thereof, I/we submit this Proposal under and in accordance with the terms of the RFP Document.

Yours faithfully,
(Signature, name and designation of the authorized signatory)
(Name and seal of the Applicant/Lead Member)

Appendix- II..

FORM-E2/T3
FIRM'S REFERENCES

The following information related to the firm should be provided in the proposal.

i. Name of the package applied for:-
ii. Year of establishment of firm*

Consultant	Year of Establishment	Country	Type of Organization			
			Partnership	Private	Public	Other
Individual/Lead Partner (of JV)/ Minor Partner of JV						

NOTE:- Year of Establishment of Lead Partner of JV shall be considered.

*Copy of Certificate of incorporation shall be submitted.

iii. Office/ Business Address/Telephone nos. /CableAddress.

iv. Narrative description of firm (Not more than 2sheets)

v. Name of two (2) principals who may be contacted with title and telephone number/faxnumber/e-mail.

Relevant Services Carried out in the Last Seven Years, Which Best Illustrate Qualifications

The following information should be provided in the format below for each reference assignment for which your firm, either individually as a corporate entity or as one of the major companies within a consortium, was legally contracted by the client:

Assignment Name:		Country:
Location within Country :		Professional Staff Provided by your firm:
Name of Client :		No. of Staff :
Address :		No. of Staff Months :
Start Date (Month / Year)	Completion Date (Month / Year)	Approx. Value of Services : (in INR/current USD) :
Name of JV Firm(s) if any :		No. of Months of Professional Staff provided by Associated Firm(s)
Status of your Company in the Assignment i.e., Sole/Lead Member/Other Member		
Narrative Description of Project :		
Description of Actual Services Provided by your Company:		

Signature of Authorized Representative

(Certificate from Employer regarding experience should be furnished)

i. Experience in DPR/ Feasibility Study preparation of 2/4/6 laning / Bridge Highway Projects separately for the PPP and non-PPP projects during the last 7 years.***

S No	Projects Name /Year Sole Consultant / Prime Consultant of JV / minor Authority's Engineer of JV consultant	Type of Services Rendered	Length of Project (kms)	Client (with Complete address, contact person, telephone Nos.and	Total Fee for the Consultancy Assignment (INR)	Fee received byApplicant (in case of JV/)	%age of total fee received by thefirm	Period
1	2	3	4	5	6	7	8	9

(ii) Experience as Authority Engineer/Independent Consultant/Construction supervision of Highway projects, separately for PPP and non-PPP Projects during the last 7 years.***

S No	Projects Name / Year Sole Consultant/ Prime Consultant of JV / minor Authority's Engineer of JVconsultant	Type of Service rendered	Description of Highway Project/ Length (kms)	Client (with complete address, contact person, Telephone Nos. and FaxNos.)	Total Fee for the Consultancy Assignment (INR)	Fee received by Applicant(in case of JV)	%age of total fee received by the firm	Approx. Cost of Highway Project	Period
1	2	3	4	5	6	7	8	9	10
		A. Completed / Substantially completed projects:							
		1. 2. 3. B. Projects in progress: 1. 2. 3.							

***a) 2/4/6 lane/Bridge work as applicable for the project for which RFP is invited. For 2- lane projects experience of 4/6 lane also to be considered with a multiplication factor of 1.5. Experience of 4/6 lane shall be considered interchangeably for 4/6 laning projects. For 4/6 lane projects, experience of 2 lane will be considered with a multiplication factor of 0.4,but only for those 2-lane projects whose cost of consultancy services was more than Rs.3.0 crores. For standalone bridge projects, experience in bridge work (either standalone project or as a part of road project) only be considered.

b) Only those projects, to be included in the table which are Highways Projects

and for which clients certificates from the concerned Government agencies are enclosed with the proposal.

c) The details of bridges having length more than 200m (500m in case the project consist of bridges of length more than 500m) in the listed projects is to be specifically mentioned.

d) The weightage given for experience of a firm would depend on the role of the firm in the respective assignments. The firm's experience would get full credit if it was the sole firm in the respective assignment. If the applicant firm has completed projects as JV with some other firms, weightage shall be given as per the JV share***. However if the applicant firm has executed the project as associate with some other firms, 25% weightage shall be given to the applicant firm for the projects completed under such association

e) For weightage of experience in any past Consultancy assignment, experience certificate from the client shall be submitted. In absence of clear demarcation of JV share in client certificate, the weightage will be treated as 60 % for lead partner and 40% for minor partner. Annual turnover duly certified by Chartered Accountant shall be accepted. In case of non-availability of such documents no weightage of turnover / experience will be considered.

(ix) Assignments on hand including those for which the Letter of Acceptance from the clients received as on 7 days prior to due date for submission of proposals: The details shall be given in the following format.

S. No	Name of Assignment	Client	Role of the firm	Date of letter of Acceptance	Date of Agreement if signed	Present status of Assignment	Team Members provided by the firm		
			Sole, Lead/ Other in JVor sub-consultant				Name	DOB	Position
(1)	(2)	(3)	(4)	(5	(6)	(7	(8)	(9)	(10)

APPENDIX-II...

FORM- E3

Financial Capacity of the Applicant

Average Annual turnover of the Bidder

(*Refer to Clauses 1.3.2 of the RFP*)

(In Rs. crore$)

Bidder type	**Annual Turnover**										**Average Annual Turnover (In Rs. crore$)**
	Year 1		**Year 2**		**Year 3**		**Year 4**		**Year 5**		
	(Rs.)	Updation factor	(Rs.)	Updation factor	(Rs.)	Updation factor	(Rs.)	Updation factor	(Rs.)	Updation factor	
1	2	3	4	5	6	7	8	9	10	11	(2x3+4x5+6x7+8x9+10x11)/5
Single entity Bidder or Lead Member including other members of the Joint Venture		**1.00**		**1.05**		**1.10**		**1.15**		**1.20**	

Name & address of Bidder's Bankers:

$*The conversion rate of USD into Rupees shall be the daily representative exchange rates published by the Reserve Bank of India for the relevant date. Where relevant date should be as on the date 28 (twenty eight) days prior to the Application Due Date.*

Instructions:

1. The Bidder shall attach copies of the balance sheets, financial statements and Annual Reports for 5 (five) years preceding the Bid Due Date. The financial statements shall:
   (a) reflect the financial situation of the Bidder;

   (b) be audited by a statutory auditor;

   (c) be complete, including all notes to the financial statements; and

   (d) correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).

2. Year 1 will be the latest completed financial year, preceding the bidding. Year 2 shall be the year immediately preceding Year 1 and so on. In case the Bid Due Date falls within 3 (three) months of the close of the latest financial year of a Bidder, it shall ignore such financial year for the purposes of its Bid and furnish all its information and certification with reference to the 5 (five) years or 1 (one) year, as the case may be, preceding its latest financial year. For the avoidance of doubt, financial year shall, for the purposes of a Bid hereunder, mean the accounting year followed by the Bidder in the course of its normal business.

3. In the case of a Joint Venture, a copy of the Jt. Bidding Agreement shall be submitted.

4. The Bidder shall also provide the name and address of the Bankers to the Bidder.

APPENDIX-III

TECHNICAL PROPOSAL

(Form-T1)

FROM (Name of Firm)	To: (Name and Address of Client)

Ladies/Gentlemen:
Subject: Submission of Technical and Financial Proposal for engagement of PMC Consultant.

We, the undersigned, offer to provide the consulting services for the above in accordance with your Request for Proposal dated (Date), and our Proposal. We are hereby submitting our Proposal, which includes this Technical Proposal for the above mentioned work.

My/Our registration No. on Infracon is ……. And my/our Infracon Team ID is ……..

Our Proposal is binding upon us. We understand you are not bound to accept any Proposal you receive

We remain,

Yours sincerely,

Managing Director/Head of the
firm/ Authorised Representative of
the firm + *
Name of the firm
Address
*Lead Member in case of JV

(Form-T-2)

Details of projects for which Technical and Financial Proposals have been submitted

Sl.No.	**Name of Project**	Consultancy Package No.	Names of Proposed Key Personnel

(Form-E2/T3)

FIRM'S REFERENCES

The following information related to the firm should be provided in the proposal.

i. Name of the package applied for:-
ii. Year of establishment offirm*

Consultant	Year of Establishment	Country	Type of Organization			
			Partnership	Private limited	Public limited	Other
Individual/Lead Partner (of JV)/ Minor Partner of JV						

NOTE:- Year of Establishment of Lead Partner of JV shall be considered.

*Copy of Certificate of incorporation shall be submitted.

iii. Office/ Business Address/Telephone nos. /CableAddress.

iv. Narrative description of firm (Not more than 2sheets)

v. Name of two (2) principals who may be contacted with title and telephone number/faxnumber/e-mail.

Relevant Services Carried out in the Last Seven Years Which Best Illustrate Qualifications

The following information should be provided in the format below for each reference assignment for which your firm, either individually as a corporate entity or as one of the major companies within a consortium, was legally contracted by the client:

Assignment Name:		Country:
Location within Country :		Professional Staff Provided by your firm:
Name of Client :		No. of Staff :
Address :		No. of Staff Months :
Start Date (Month / Year)	Completion Date (Month / Year)	Approx. Value of Services : (in INR/current USD) :
Name of JV Firm(s) if any :		No. of Months of Professional Staff provided by Associated Firm(s)
Status of your Company in the Assignment i.e., Sole/Lead Member/Other Member		
Narrative Description of Project :		
Description of Actual Services Provided by your Company:		

Signature of Authorized Representative

(Certificate from Employer regarding experience should be furnished)

(iii) Experience in DPR/ Feasibility Study preparation of 2/4/6 laning / Bridge Highway Projects separately for the PPP and non-PPP projects during the last 7 years.***

S No	Projects Name /Year Sole Consultant / Prime Consultant of JV / minor Authority's Engineer of JV consultant	Type of Services Rendered	Length of Project (kms)	Client (with Complete address, contact person, telephone Nos.and	Total Fee for the Consultancy Assignment (INR)	Fee received byApplicant (in case of JV/) case of JV)	%age of total fee received by the firm	Period
1	2	3	4	5	6	7	8	9

(iv) Experience as Authority Engineer/Independent Consultant/Construction supervision of Highway projects, separately for PPP and non-PPP Projects during the last 7 years.***

S No	Projects Name / Year Sole Consultant/ Prime Consultant of JV / minor Authority's Engineer of JV consultant	Type of Services rendered	Description of Highway Project/ Length (kms)	Client(with complete address, contact person, Telephone Nos. and Fax Nos.)	Total Fee for the Consultancy Assignment (INR)	Fee received by Applicant (in case of JV/)	%age of total fee received by the firm	Approx. Cost of Highway Project	Period
1	2	3	4	5	6	7	8	9	10
		A. Completed / Substantially completed projects:							
		1. 2. 3. B. Projects in progress: 1. 2. 3.							

***a) 2/4/6 lane/Bridge work as applicable for the project for which RFP is invited. For 2- lane projects experience of 4/6 lane also to be considered with a multiplication factor of 1.5. Experience of 4/6 lane shall be considered interchangeably for 4/6 laning projects. For 4/6 lane projects, experience of 2 lane will be considered with a multiplication factor of 0.4, but only for those 2-lane projects whose cost of consultancy services was more than Rs. 3.0 crores. For standalone bridge projects, experience in bridge work (either

standalone project or as a part of road project) only be considered.

f) Only those projects, to be included in the table which are Highways Projects and for which clients certificates from the concerned Government agencies are enclosed with the proposal.

g) The details of bridges having length more than 200m (500m in case the project consist of bridges of length more than 500m) in the listed projects is to be specifically mentioned.

h) The weightage given for experience of a firm would depend on the role of the firm in the respective assignments. The firm's experience would get full credit if it was the sole firm in the respective assignment. If the applicant firm has completed projects as JV with some other firms, weightage shall be given as per the JV share***. However if the applicant firm has executed the project as associate with some other firms, 25% weightage shall be given to the applicant firm for the projects completed under such association

i) For weightage of experience in any past Consultancy assignment, experience certificate from the client shall be submitted. In absence of clear demarcation of JV share in client certificate, the weightage will be treated as 60 % for lead partner and 40% for minor partner. Annual turnover duly certified by Chartered Accountant shall be accepted. In case of non-availability of such documents no weightage of turnover / experience will be considered.

(ix) Assignments on hand including those for which the Letter of Acceptance from the clients received as on 7 days prior to due date for submission of proposals: The details shall be given in the following format.

S. No	Name of Assignment	Client	Role of the firm	Date of letter of Acceptance	Date of Agreement if signed	Present status of Assignment	Team Members provided by the firm		
			Sole, Lead/ Other in JV or sub-consultant				Name	DOB	Position
(1)	(2)	(3)	(4)	(5	(6	(7	(8)	(9)	(10)

Signature of Authorised Representative

(Certificate from Employer regarding experience should be furnished

Form-T3-A

Information required to evaluate the BID Capacity under clause 1.3.2:

To calculate the value of "A"

Average Annual turnoverof the Bidder

(*Refer to Clauses 1.3.2 of the RFP*)

(In Rs. crore[$])

Bidder type	**Annual Turnover**										**Average Annual Turnover (In Rs. crore[$])**
	Year 1		**Year 2**		**Year 3**		**Year 4**		**Year 5**		
	(Rs.)	Updation factor	(Rs.)	Updation factor	(Rs.)	Updation factor	(Rs.)	Updation factor	(Rs.)	Updation factor	
1	2	3	4	5	6	7	8	9	10	11	(2x3+4x5+6x7+8x9+10x11)/5
Single entity Bidder or Lead Member including other members of the Joint Venture		**1.00**		**1.05**		**1.10**		**1.15**		**1.20**	

Name & address of Bidder's Bankers:

$*The conversion rate of USD into Rupees shall be the daily representative exchange rates published by the Reserve Bank of India for the relevant date.Where relevant date should be as on the date 28 (twenty eight) days prior to the Application Due Date.*

Instructions:

1. The Bidder shall attach copies of the balance sheets, financial statements and Annual Reports for 5 (five) years preceding the Bid Due Date. The financial statements shall:
   (a) reflect the financial situation of the Bidder;

   (b) be audited by a statutory auditor;

   (c) be complete, including all notes to the financial statements; and

   (d) correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).

2. Year 1 will be the latest completed financial year, preceding the bidding. Year 2 shall be the year immediately preceding Year 1 and so on. In case the Bid Due Date falls within 3 (three) months of the close of the latest financial year of a Bidder, it shall ignore such financial year for the purposes of its Bid and furnish all its information and certification with reference to the 5 (five) years or 1 (one) year, as the case may be, preceding its latest financial year. For the avoidance of doubt, financial year shall, for the purposes of a Bid here under, mean the accounting year followed by the Bidder in the course of its normal business.

3. In the case of a Joint Venture, a copy of the Jt. Bidding Agreement shall be submitted.

4. The Bidder shall also provide the name and address of the Bankers to the Bidder.

Form-T3-B

To calculate the value of "B"

A table containing value of all the existing commitments and on-going works to be completed during the next ** years is as follows:

S N	Name of Consultancy of Road Work	Percentage of participation of Bidder in the project	Dater of start / appointed date of project	Consultancy period as per Agreement /LOA	Value of contract as per Agreement /LOA[β]	Value of work completed	Balance value of work to be completed	Anticipated date of completion	Balance value of work at 2019-18/2019 price level
					Rs. in Crore	Rs. in Crore	Rs. in Crore		Rs. In Crore
1	2	3	4	5	6	7	8= (6-7)	9	10(3x 8x #)

The Statement showing the value of all existing commitments, anticipated value of consultancy work to be completed in the period of PMC consultancy work for which bid is invited and ongoing works as well as the stipulated period of completion remaining for each of the consultancy works mentioned above is verified from the certificate issued that has been countersigned by the Client or its Engineer-in-charge not below the rank of Executive Engineer or equivalent. No awarded / ongoing works has been left in the aforesaid statement which has been awarded to M/s……individually / and other member M/s …….. and M/s ……., as on bid due date of this RFP.

……. ……. Signature, name and designation of Authorised Signatory	……. ……. Name of the Statutory Auditor's firm: Seal of the audit firm: (Signature, name

Date:

Place:

Date:

Place:

[β] In case balance period of Consultancy is less than the value of period of Consultancy of the project for which bid is invited, then full value of Consultancy work as per Agreement/LOA to be mentioned, else, anticipated value of Consultancy work to be completed in the period of Consultancy of the project for which bid is invited is to be mentioned. In the absence of the anticipated value of Consultancy work to be completed, the proportionate value shall be considered while evaluating the Assessed Available Bid Capacity.

(Form- T4)

SITE APPRECIATION

Shall give details of site as per actual site visit and data provided in RFP and collected from site supported by photographs to demonstrate that responsible personnel of the Consultant have actually visited the site and familiarized with the salient details/complexities and scope of services.

(Form- T5)

Composition of the Team Personnel and the task Which would be assigned to each Team Member For DPR work

I. Technical/Managerial Staff

Sr .No.	Name	Position	Task Assignment
1.			
2.			
3.			
4.			
…….			

II. Support Staff

Sr. No.	Name	Position	Task Assignment
1.			
2.			
3.			
4.			
….			
….			

(Form- T6)

APPROACH PAPER ON METHODOLOGY PROPOSED FOR PERFORMING THE DPR AND PRECONSTRUCTION WORK

The approach and methodology will be detailed precisely under the following topics.

1) Methodology for services, surveying, data collection [not more than 2 pages] and analysis

2) Quality Assurance system for consultancy assignment [not more than 1 page]

3) The key challenges foreseen and proposed solutions will be detailed precisely under the following topics

   a) proposed alignment and bypass required

   b) land acquisition requirements

   c) access control, rehabilitation of existing road, drainage and utilities

   d) adoption of superior technology along with proof (to be submitted in Form T9)

   e) Clearances for the preconstruction activities.

   f) Utilioty shifting, Tree cutting etc.

Replies to items 3) a) to c) should be limited to six A4 size pages in 1.5 space and 12 font including photographs, if any

(Form- T7)

Details of Material Testing Facility

1. State whether the Applicant has in-house Material Testing Facility Available /Outsourced/Not Available

2. In case answer to 1 is Available, attach a list of Lab equipment and facility for testing of materials and location of laboratory

3. In case laboratory is located at a distance of more than 400 km from the project site, state arrangements made/proposed to be made for testing of materials

4. In case answer to 1 is Outsourced/ Not Available state arrangements made/proposed to be made for testing of materials.

(Form- T8)

Facility for Field investigation and Testing

1. State whether the Applicant has in-house Facility for

   a) Geo-technical investigation Available (created in-house at site)/ Outsourced/ Not Available

   b) Pavement investigation Available (created in-house at site)/ Outsourced/ Not Available

2. In case answer to 1 is Available (created in-house at site) a list of field investigation and testing equipments available in-house

3. In case answer to 1 is Outsourced/ Not Available arrangements made/proposed to be made for each of above Field investigation and testing

4. For experience in LIDAR or better technology for topographic survey, GPR and Induction Locator or better technologies for detection of sub-surface utilities and digitization of cadastral maps for land acquisition, references need to be provided in following format:

REFERENCES

Relevant Services Carried Out Which Best Illustrate Qualifications

The following information should be provided in the format below for each reference assignment for which your firm, either individually as a corporate entity or as one of the major companies within a consortium, was legally contracted by the client:

<table>
<tr><td colspan="2">Assignment Name:</td><td>Country:</td></tr>
<tr><td colspan="2">Location within Country :</td><td>Professional Staff Provided by your firm:</td></tr>
<tr><td colspan="2">Name of Client :</td><td>No. of Staff :</td></tr>
<tr><td colspan="2">Address :</td><td>No. of Staff Months :</td></tr>
<tr><td colspan="3">Technology Used:</td></tr>
<tr><td>Start Date (Month / Year)</td><td>Completion Date (Month / Year)</td><td>Approx. Value of Services : (in INR/current USD) :</td></tr>
<tr><td colspan="2">Name of JV Firm(s) if any :</td><td>No. of Months of Professional Staff provided by Associated Firm(s)</td></tr>
<tr><td colspan="3">Status of your Company in the Assignment i.e., Sole/Lead Member/Other Member/Associate</td></tr>
<tr><td colspan="3">Narrative Description of Project :</td></tr>
<tr><td colspan="3">Description of Actual Services Provided by your Company:</td></tr>
</table>

Signature of Authorised Representative

(Certificate from Employer regarding experience should be furnished)

Also to provide details of following facilities to be used during construction supervision

1. State whether applicant has in-house (created in house at site)/ outsourced/ not available facility for
   - Surface defects detection and roughness measurement using Network Survey Vehicle
   - Pavement strength measurement using FWD
   - Bridge inspection using Mobile Bridge Inspection Unit or Drone technology
   - Road signs inspection using Retro-Reflectometer
2. In-case answer to 1 is available (created inhouse at site) a list of field investigation and testing equipment is to be attached
3. In case answer to 1 is outsourced/not available – arrangements made or proposed to be made for each of the above field investigations is to be attached
4. For experience in NSV, FWD, MBIU and reflectometer, references need to be provided in the following format:

REFERENCES

Relevant Services Carried Which Best Illustrate Qualifications

The following information should be provided in the format below for each reference assignment for which your firm, either individually as a corporate entity or as one of the major companies within a consortium, was legally contracted by the client:

<table>
<tr><td colspan="2">Assignment Name:</td><td>Country:</td></tr>
<tr><td colspan="2">Location within Country:</td><td>Professional Staff Provided by your firm:</td></tr>
<tr><td colspan="2">Name of Client :</td><td>No. of Staff :</td></tr>
<tr><td colspan="2">Address :</td><td>No. of Staff Months :</td></tr>
<tr><td colspan="3">Technology Used:</td></tr>
<tr><td>Start Date
(Month / Year)</td><td>Completion Date
(Month / Year)</td><td>Approx. Value of Services in INR/current USD):</td></tr>
<tr><td colspan="2">Name of JV Firm(s)if any:</td><td>No. of Months of Professional Staff provided by Associated Firm(s)</td></tr>
<tr><td colspan="3">Status of your Company in the Assignment i.e., Sole/Lead Member/Other Member/Associate</td></tr>
<tr><td colspan="3">Narrative Description of Project :</td></tr>
<tr><td colspan="3">Description of Actual Services Provided by your Company:</td></tr>
</table>

Signature of Authorised Representative

(Certificate from Employer regarding experience should be furnished)

(Form- T9)

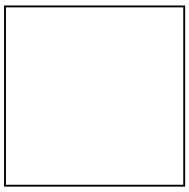
Office Equipment and software

Attach a list of office equipment and software owned by the Applicant

(Form- T10)

(Curriculum Vitae as per INFRACON)

CVs of the Key Personnel should be uploaded on INFRACON and the hard copies of the CVs as uploaded on the INFRACON is to be submitted along with the Technical Proposals.

Proposed Position:…… Photograph 

Name of Firm:.....

Name of Staff :.....

Profession :.....

Date of Birth :

Years with Firm/Entity: .....Nationality:..... Membership of

Professional Societies :.....

Detailed Task Assigned : Please attach printout of CV along with all the relevant details uploaded on infracon portal.

(Form- T10)...

CERTIFICATION BY THE CANDIDATE

I, the undersigned, (Name and Address) undertake that this CV correctly describes myself, my qualifications and my experience and Employer would be at liberty to debar me if any information given in the CV, in particular the Summary of Qualification & Experience vis-à-vis the requirements as per TOR is found incorrect. I further undertake that I have neither been debarred by MORT&H or its implementing agencies or any other central/stage government organization nor left any assignment with the consultants engaged by Employer / contracting firm (firm to be supervised now) for any continuing work of Employer without completing my assignment. I will be available for the entire duration of the current project (named…..). If I leave this assignment in the middle of the work, Employer would be at liberty to debar me from taking any assignment in any of the Employer works for an appropriate period of time to be decided by the Employer. I have no objection if my services are extended by the Employer for this work in future.

I further undertake that my CV is being proposed for this project by---------(the applicant firm) and I have not given consent to any other consultant(s) to propose my CV for any position for this project.

I further undertake that if due to my inability to work on this project due to unavoidable circumstances, due to which consultant's firm is forced to seek replacement. In such unavoidable circumstances, I shall not undertake any employment in Employer projects during the period of assignment of this project and Employer shall consider my CV invalid till such time.

I undertake that I have no objection in uploading/hosting of my credentials by Employer in public domain.

For Key Personnel having intermittent inputs, add the following:

I further certify that I am associated with the following assignments as on date (as on 7 days prior to due date for submission of proposal) including those for which LOA has been received by the firm and the inputs in these assignments shall not effect the work of the current assignment.

Name of Assignment	Client	Date of LOA	Likely start (Month / Year)	Likely end (Month /Year)	Total input of the person (man-months)

……..Date
(Signature of Key Personnel)

(Day/Month/Year)

The PMC should carryout self-evaluation based on the evaluation criteria at Appendix-EC and furnish the same here. While submitting the self-evaluation along with bid, Authority's Engineer shall make references to the documents which have been relied upon in his self-evaluation.

(Form- T10)...

CERTIFICATION BY THE FIRM

The undersigned on behalf of ----------(name of consulting firm) certify that Shri--------(name of proposed personnel) to the best of our knowledge has neither been debarred by MORT&H or its implemeting agencies or any other Central/State Government organization nor left his assignment with any other consulting firm engaged by the Employer/Contracting firm (firm to be supervised now) for the ongoing projects. We also confirm the truthfulness of the credentials uploaded by our firm / JV Member / Associate and all the Key Personnel proposed in our team on INFRACON

We understand that if any information about our firm/JV Member/ Key Personnel is found contrary to what has been uploaded on INFRACON, the Client would be at liberty to remove the concerned personnel from the present assignment and debar our firm/JV Member/Associate / Key Personnel for an appropriate period to be decided by the Client, if the information is submitted by the consultant wilfully.

We understand that if the information about leaving the past assignment is known to the Employer, Employer would be at liberty to remove the personnel from the present assignment and debar him for an appropriate period to be decided by the Employer.

……..Date : …… (Day/Month/Year)

[Signature of authorized representative of the Firm]

(Form- T11)

INTEGRITY PACT

(To be executed on plain paper and submitted along with TechnicalBid / Tender documents for tenders having a value between Rs.5 Cr and 100 Cr. To be signed by the bidder and same signatory competent/ authorized to sign the relevant contract on behalf of the MORT&H)

Tender No._____

This integrity Pact is made at_____on this_____day of_____2018. Between

MORT&H, here in after referred to as "**The Principal**",which expression shall unless repugnant to the meaning or contract thereof include its successors and permitted assigns.

And

_____ Herein after referred to as "**The Bidder/Contractor /Concessionaire/Consultant**" and which expression shall unless repugnant to be meaning or context thereof include its successors and permitted assigns.

Preamble

Whereas, the Principal intends to award, under laid down organizational procedures, contract/s for "**Authority Engineer Services for the project of ----Project name----".** The Principal values full compliance with all relevant laws of the land, rules of land, regulations, economic use of resources and of fairness/ transparency in its relations with its Bidder(s) and/ or Contractor(s)/Concessionaire(s)/ Consultant(s).

And whereas to meet the purpose aforesaid, both the parties have agreed to enter into this Integrity Pact (hereafter referred to as Integrity Pact) the terms and conditions of which shall also be read as integral part and parcel of the Tender documents and contract between the parties. Now, therefore, in consideration of mutual covenants stipulated in this pact, the parties hereby agree as follows and this pact witnesses as under:-

Article-1 Commitments of the Principal

1. The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

   a. No employee of the Principal, personally or through family members, will in

connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self, or third person, any material of immaterial benefit which the person is not legally entitled to.

b. The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

c. The Principal will exclude all known prejudiced persons from the process, whose conduct in the past has been of biased nature.

2. If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the IPC/PC Act or any other Statutory Acts or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can initiate disciplinary actions as per its internal laid down Rules/Regulations.

Article – 2 Commitments of the Bidder(s)/ Contractor(s)/ Concessionaire(s)/ Consultant(s).

The Bidder(s)/ Contractor(s)/ Concessionaire(s)/ Consultant(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

(a) The Bidder(s)/ Contractor(s)/ Concessionaire(s)/ Consultant(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitle do, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of thecontract.

(b) The Bidder(s)/ Contractor(s)/ Concessionaire(s)/ Consultant(s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission or bids or any other action store strict competitiveness or to introduce cartelization in the bidding process.

(c) The Bidder(s)/ Contractor(s)/ Concessionaire(s)/ Consultant(s) will not commit any offence under the relevant IPC/PC Act and other Statutory Acts; further the Bidder(s)/ Contractor(s)/ Concessionaire(s)/ Consultant(s) will not use improperly, for purposes of completion or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business

details, including information contained or transmitted electronically.

(d) The Bidder(s)/ Contractor(s)/ Concessionaire(s)/ Consultant(s) of foreign-origin shall disclose the name and address of the Agents/ Representatives in India, if any. Similarly the Bidder(s)/ Contractor(s)/ Concessionaire(s)/ Consultant(s) of Indian Nationality shall furnish the name and address of the foreign principle, if any.

(e) The Bidder(s)/ Contractor(s)/ Concessionaire(s)/ Consultant(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract. He shall also disclose the details of services agreed upon for such payments.

(f) The Bidder(s)/ Contractor(s)/ Concessionaire(s)/ Consultant(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

(g) The Bidder(s)/ Contractor(s)/ Concessionaire(s)/ Consultant(s) will not bring any outside influence through any Govt. bodies/quarters directly or indirectly on the bidding process in furtherance of his bid.

Article–3 Disqualification from tender process and exclusion from future contracts.

1. If the Bidder(s)/ Contractor(s)/ Concessionaire(s)/ Consultant(s), before award or during execution has committed a transgression through a violation of any provision of Article-2, above or in any other form such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s)/ Concessionaire(s)/ Consultant(s) from the tender process.

2. If the Bidder/ Contractor/ Concessionaire/ Authority's Engineer has committed a transgression through a violation of Article-2 such as to put his reliability or credibility into question, the Principal shall be entitled to exclude including blacklist and put on holiday the Bidder/ Contractor/ Concessionaire/ Authority's Engineer for any future tenders/ contract award process. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the Principal taking into consideration the full facts and circumstances of each case particularly taking into account the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder/ Contractor/ Concessionaire/ Authority's Engineer and the amount of the damage. The exclusion will be imposed for a minimum of 1 year.

3. A transgression is considered to have occurred if the Principal after due consideration of the available evidence concludes that "On the basis of facts available there are no material doubts".

4. The Bidder/ Contractor/ Concessionaire/ Authority's Engineer with its free consent and without any influence agrees and undertakes to respect and uphold the

Principal's absolute rights to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.

5. The decision of the Principal to the effect that a breach of the provisions of this Integrity Pact has been committed by the Bidder/ Contractor/ Concessionaire/ Authority's Engineer shall be final and binding on the Bidder/ Contractor/ Concessionaire/ Consultant.

6. On occurrence of any sanctions/ disqualification etc arising out from violation of integrity pact, the Bidder/ Contractor/ Concessionaire/ Authority's Engineer shall not be entitled for any compensation on this account.

7. Subject to full satisfaction of the Principal, the exclusion of the Bidder/ Contractor/ Concessionaire/ Authority's Engineer could be revoked by the Principal if the Bidder/ Contractor/ Concessionaire/ Authority's Engineer can prove that he has restored/recouped the damage caused by him and has installed a suitable corruption prevention system in his organization.

Article – 4 Compensation for Damages.

1. If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Arcticle-3, the Principal shall be entitled to forfeit the Earnest Money Deposit/ Bid Security or demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security (equivalent to 1% of Contract Price) apart from any other legal right that may have accrued to thePrincipal.

2. In addition to 1 above, the Principal shall be entitled to take recourse to the relevant provisions of the contract related to Termination of Contract due to Contractor/ Concessionaire/Consultant's Default. In such case, the Principal shall be entitled to forfeit the Performance Bank Guarantee of the Contractor/ Concessionaire/ Authority's Engineer and/ or demand and recover liquidated and all damages as per the provisions of the contract/concession agreement against Termination.

Article–5 Previous Transgression

1. The Bidder declares that no previous transgressions occurred in the last 3 years immediately before signing of this Integrity Pact with any other Company in any country conforming to the anti corruption/ Transparency International (TI) approach or with any other Public Sector Enterprise/ Undertaking in India or any Government Department in India that could justify his exclusion from the tender process.

2. If the Bidder makes in correct statement on this subject, he can be disqualified from

the tender process or action for his exclusion can be taken as mentioned under Article-3 above for transgressions of Article-2 and shall be liable for compensation for damages as per Article-4 above.

Article-6 Equal treatments of all Bidders/ Contractors/ Concessionaires/ Consultants/ Subcontractors.

1. The Bidder(s)/ Contractor(s)/ Concessionaire(s)/ Consultant(s) undertake(s) to demand from all sub-contractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.

2. The Principal will enter into agreements with identical conditions as this one with all Bidders/ Contractors/ Concessionaires/ Consultants and Subcontractors.

3. The Principal will disqualify from the tender process all Bidders who do not sign this Pact or violate itsprovisions.

Article – 7 Criminal charges against violating Bidder(s)/ Contractor(s)/ Concessionaire(s)/ Consultant(s)/ Sub-contractor(s).

If the Principal obtains knowledge of conduct of a Bidder/ Contractor/ Concessionaire/ Authority's Engineer or Subcontractor, or of an employee or a representative or an associate of a Bidder/ Contractor/ Concessionaire/ Authority's Engineer or Subcontractor, which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer.

Article – 8 Pact Duration

This Pact begins when both parties have legally signed it. (In case of EPC i.e. for projects funded by Principal and consultancy services). It expires for the Contractor/ Authority's Engineer 12 months after his Defect Liability period is over or 12 months after his last payment under the contract whichever is later and for all other unsuccessful Bidders 6 months after this Contract has been awarded. (In case of BOT Projects) It expires for the concessionaire 24 months after his concession period is over and for all other unsuccessful Bidders 6 months after this Contract has been awarded.

If any claim is made/ lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/ determined by MORT&H.

Article – 10 Other Provisions.

1. This pact is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Principal, i.e.....

2. Changes and supplements as well as termination notices need to be made in writing.

3. If the Bidder/Contractor/Concessionaire/Authority's Engineer is a partnership or a consortium, this pact must be signed by all partners or consortium members.

4. Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

5. Any disputes/ differences arising between the parties with regard to term of this pact, any action taken by the Principal in accordance with this Pact or interpretation thereof shall not be subject to any Arbitration.

6. The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

In witness whereof the parties have signed and executed this Pact at the place and date first done mentioned in the presence of following witness:-

(For & On behalf of the Principal)	(For & On behalf of theBidder/ Contractor/ Concessionaire/ Authority's Engineer)
(Office Seal)	
Place_____Date___	
Witness 1 :	
(Name & Address):_____	
Witness 2 :	
(Name & Address): _____	

(Form- T12)

Bid Securing Declaration

(Refer Clauses 3.2.3)

I hereby submit a declaration that the bid submitted by the undersigned, on behalf of the *consultant*, *[Name of the consultant], either sole or in JV,* shall not be withdrawn or modified during the period of validity i.e. not less than 120 *(one* hundred twenty) days from the bid due date.

I, on behalf of the *consultant*, *[Name of the consultant],* also accept the fact that in case the bid is withdrawn or modified during the period of its validity *or* if *we* fail to sign the contract in case the work is awarded to us or we fail to submit a performance security before the deadline defined in clause 6.1 of the letter of Invitation (LOI), then *[Name of the consultant]* will be suspended for participation in the tendering process for the consultancy works of MoRTH/NHAIINHIDCL and consultancy works under other Centrally Sponsored Schemes, for a period of two years from the bid due date of this work.

(Signature of the Authorised Signatory) (Official-
Seal)

APPENDIX-IV

FINANCIAL PROPOSALS

(FORM-I)

FROM : (Name of Firm) **TO:**

Address of Employer

Subject :

We, the undersigned, offer to provide the consulting services for the above in accordance with your Request for Proposal dated [Date], and our proposal. Our attached financial proposal is for the sum of [Amount in words and figures].This amount is inclusive of the taxes except Goods and Services Tax which shall be reimbursed by the authority.

Our financial proposal shall be binding upon us upto the expiration of the validity period of the proposal, i.e., [Date].

We undertake that, in competing for (and, if the award is made to us, in executing) the above contract, we will strictly observe the laws against fraud and corruption in force in India namely "Prevention of Corruption Act 1988".

Commission and gratuities, if any, paid or to be paid by us to agents relating to this proposal and contract execution, if we are awarded the contract, are listed below:

Name and Address of Agents	Amount and Currency	Purpose of Commission or Gratuity
.....	.....	.....
.....	.....	.....

We understand you are not bound to accept any proposal you receive.

We
remain,
Yours
sincerely,

Managing Director/Head of the firm/
Authorised Representative of the
firm* Name of the firm
Address
*Lead Member in case of JV

(FORM-II)

Format of Financial Proposal

Summary of Cost in Local Currency

A. For Phase 1 & 2 (DPR and PRECONSTRUCTION ACTIVITIES)

No.	Description	Amount(LC)* (INR)
I	**Local Consultants** Remuneration for Local Staff (inclusive of perdiem allowance)	
II	Support Staff (inclusive of per diem allowance)	
III	Transportation	
IV	Duty Travel to Site	
V	Office Rent	
VI	Office Supplies, Utilities and Communication	
VII	Office Furniture and Equipment (Rental)	
VIII	Reports and Document Printing	
IX A B C	Surveys & Investigations Topographical Survey Investigations Net Work Survey and GPR	
X	Cost of supply and fixing Boundary Pillars	
XI	Land Acquisition Team including support staff and logistics/transportation	
	Subtotal Local Consultants :	
	Foreign Consultants	
F-I	Remuneration for Expatriate Staff	
F-II	Mobilization and Demobilization	
	Total cost net of Goods & service tax**	

A. For Phase 3 (Construction Supervision and Maintenance)

No.	Description	Amount (Rs.)
I	Remuneration for Local Professional Staff	
II	Supporting Staff	
III	Transportation	
IV	Duty Travel to Site	
V	Office Rent	
VI	Office Supplies, Utilities and Communication	
VII	Office Furniture and Equipment	
VIII	Reports and Document Printing	
IX	Road Survey Equipment	
X	Contingencies	
	Total cost net of Goods & service tax**	

Total for Phase 1 2 &3

	Grand Total net of Goods and Service tax (for all 3 phases)	
	Goods and Service tax	
	Grand Total including goods and service tax (for all 3 phases)	

Note: Payments will be made as per stipulations of the Conditions of Contract.

LC* Local Currency

** Total Cost Net of Goods &Service Tax shall be considered for financial evaluation

Note: Escalation shall be paid @ of 5% after each 12 months from the bid due date.

Insurances shall not be allowed separately. These will be incidental to main items.

Rates for all items shall be quoted in figures as well as in words.

(FORM-III)

Estimate of Local Currency Costs

A. For Phase 1 & 2 (DPR and PRECONSTRUCTION ACTIVITIES)

I. Remuneration for Local Staff (including per diem allowance)

(Normal Highway Project)

Sr.No.	Position	Name	Rate(INR)	StaffMonth	Amt.(INR)
	Professional Staff				
1	Team Leader cum Senior Highway Engineer			17	
2	Senior Bridge Engineer			5	
3	Highway cum Pavement Engineer			5	
4	Material-cum-Geotechnical Engineer- Geologist			6	
5	Senior Survey Engineer			13	
6	Road/Traffic Safety Expert			4	
7	Environmental Specialist			6	
8	Quantity Surveyor/ Documentation Expert			6	
9	Land Acquisition Expert			14	
10	Utility Expert			12	
	Sub-Total:				
	Sub-Professional Staff	(To be assessed by Consultant as per requirement of assignment and one sub-professional be a fresh graduate)			
1					
2					
3					
4					
5					
6					
7					
	Sub-Total:				
	TOTAL				

Sr. No.	Position	Name	Rate(INR)	Staff Month	Amt.(INR)
	Professional Staff				
1	Team Leader cum Senior Bridge Engineer			10	
2	Senior Bridge Engineer			6	
3	Highway cum Pavement Engineer			10	
4	Material-cum-Geotechnical Engineer- Geologist			10	
5	Senior Survey Engineer			6	
6	Senior Geologist			6	
7	Environmental Specialist			6	
8	Quantity Surveyor/Documentation Expert			4	
	Sub-Total:			58	
	Sub-Professional Staff	(To be assessed by Consultant as per requirement of assignment and one sub-professional be a fresh graduate)			
1					
2					
3					
4					
5					
6					
7					
	Sub-Total:				
	TOTAL				

(For Standalone Bridge Project)

For Standalone Tunnel Project

Sr. No.	Position	Name	Rate(INR)	Staff Month	Amt.(INR)
	Professional Staff				
1	Team Leader cum Senior Tunnel Engineer			10	

Sr. No.	Position	Name	Rate(INR)	Staff Month	Amt.(INR)
2	Tunnel Design Expert			10	
3	Senior Geophysicist			6	
4	Senior Geotechnical Engineer			10	
5	Senior E&M Expert			6	
6	Senior Geologist			10	
7	Environmental Specialist			4	
8	Material Engineer			6	
9	Highway cum Pavement Engineer			4	
10	Quantity Surveyor cum Documentation Expert			4	
11	Senior Survey Engineer			6	
	Sub-Total:				
	Sub-Professional Staff	(To be assessed by Consultant as per requirementof assignment and one sub-professional be a fresh graduate)			
1					
2					
3					
4					
5					
6					
7					
	Sub-Total:				
	TOTAL				

II.Support Staff

No.	Position	Name	Staff Months	Billing Rate(INR)	Amount (INR)
1 2 3 4	Office Manager Typist Office Boy Night Watchman				
				Total :	

III. Transportation (Fixed costs)

S.No	Description	Qty.	Nos. of months	Rate/ Month (INR)	Amount(INR)
1	The vehicles provided by theConsultants shall include the cost for rental, drivers, operation, maintenance, repairs, insurance, etc. A. For use of consultants				
	Total				

IV.Duty Travel to Site (Fixed Costs)

V.Office Rent (Fixed Costs)

The rent cost includes maintenance, cleaning, repairs, etc. months x

Total_

VI.Office Supplies, Utilities and Communication (Fixed Costs)

No.	Item	Months	Monthly Rate (INR)	Amount InINR.
1 2 3 4	Office Supplies Drafting Supplies Computer Running Costs Domestic and International Communication			

TOTAL:----------

VII. Office Furniture and Equipment (Rental)

No.	Description	Unit	Quantity	Rate (INR)	Amount (INR)
1	Office Furniture and Equipment		LS		
				Total	

VIII. Reports and Document Printing

No.	Description	No. ofCopies	Rate per Copy(INR.)	Amount(INR)
1	Monthly Report	3 PerMonth		

No.	Description	No. ofCopies	Rate per Copy(INR.)	Amount(INR)
2	Inception Report & QAP	3		
3	Environment and Social ImpactScreening Report	4		
4	Draft Feasibility Report	4		
5	Final Feasibility Report	6		
6	Strip Plan with L.A. Reports	6		
7	Draft LA and Clearances I Report	4		
8	Final LA and Clearances I Report	4		
9	Draft Environmental Assessment report & RAP	4		
10	Final Environmental Assessment report & RAP	6		
11	Draft Detailed Design Report & Drawings etc. Draft EMP	4 4		
12	Draft Bidding Documents	4		
13	Final Detailed Project Report with Bill of Quantities, Cost Estimates, Updated Drawings etc. Final EMP	6 6		
14	Final Bidding Documents	6		
15	Draft 3(a) ,3(A) and 3(D) notification for land acquisition (3 copies each)	9		
16	LA & Clearances II Report	6		
			Total	

IX. Survey and Investigation

A. Topographical Survey (Fixed Rate)

No.	Item	Kms	Rate per Km(INR)	Amount(INR)
1	Topographic Survey including hire charges for equipment and supply of survey teams comprising of project survey filed staff etc. inclusive of cost of materials, labourer			
2	Detailed topographic surveys using mobile/ aerial LiDAR or better technology			

B. Investigation (Fixed cost)

No.	Description		Quantity	Amount (INR)
1	Road and Bridge Inventory			
2	FWD Test and Pavement Evaluation			
3	Roughness Survey			
4	Axle Load Survey			
5	Material Survey and Investigation			
6	Sub-grade Investigation			
7	Traffic Survey			
8	Socio-economic & Census Survey/Studies			
9	Land Acquisition Studies			
10	Any other investigations/surveys			
11	*Sub-Soil Investigation (Boring)	Rate	Qty.	Amount (Rs)
	a) Boring in all type of soils (other than hard rock) b)Boring in hard rock		1500m (for projects of length < 110 km) or 2000m (for projects of length > 110 km) 200m (for projects of length < 110 km) or 300m (for projects of length > 110 km)	
	Total			

Note:* Quantities of borings shall be taken from Financial Proposal Form No.V. For financial evaluation, these quantities and rates quoted by the consultant will be considered. However, Payment shall be made on the actual quantity of boring at rates quoted above by the Consultant, which may be substantially more or less than the estimated quantities.

C. Network Survey and GPR

No.	Description	Unit	Quantity	Rate (INR)	Amount (INR)
1	Network Survey of the existing Highways as a repository for civil work as per directions from Authority.	Job	1		
2	GPR Survey for detection of under ground	Job	1		

No.	Description	Unit	Quantity	Rate (INR)	Amount (INR)
	utilities				
				Total	

X. Cost of supply and fixing Boundary Pillars

Item		Amount (INR.)
Procuring and fixing boundary pillars and its installation, complete in all respect as per IRC: 25, 1967: Wherever the proposed alignment follows the existing alignment, the boundary pillars shall be fixed at an interval of 200m on either side of proposed Right of Way. Wherever there is a proposal of realignment of the existing Highway and/or construction of New Bypasses, Consultant shall fix boundary pillars along the proposed alignment on the extreme boundary on either side of the project Highway at 50 m interval. (lumpsum)		

XI Land Acquisition Team including support staff and logistics/transportation

(A) Land acquisition Team including support staff:

S. No.	Position	Name	Number	Rate (INR)	Man Months	Amount (INR)
1	Ex-Land Revenue Inspector/Officer or equivalent	TBN	1		8	
2	Ex-Kanoogo/Girdwar or equivalent	TBN	1		8	
3	Ex-Patwari or equivalent	TBN	1		8	
4	Typist	TBN	2		8	
5	Peon	TBN	1		8	
					Total	
					Number of Land acquisition Teams	
					Grand Total for All Land acquisition Teams (A)	

(B) Logistics for Land acquisition Team:

S. No.	Item particulars	Number	Months	Rate (INR)	Amount (INR)
1	Computer including necessary peripherals	2	8		
2	Printers	2	8		
3	Vehicles (Bolero or equivalent) with monthly running limit of 4000 km	1	8		
				Total	
				Number of Land acquisition Teams	
				Grand Total (B)	
				Grand Total for All Land acquisition Teams and Logistics (A) + (B)	

Note: The Consultant shall provide one Land Acquisition Expert along with allied team and supporting logistic as envisaged in Clause 5.1.5.1 of TOR for each 100 km stretches proposed for DPR preparation or part thereof (For example total length of package is 343 km, there will be four team).

Estimate of Local Currency costs

B. FOR PHASE 3 (CONSTRUCTION SUPERVISION AND MAINTENANCE)

I. REMUNERATION FOR LOCAL PROFESSIONAL STAFF

Normal Highway Project

For Project with Construction Period of 18 months

No.	Position	Name	Construction Period 18months+DLP 60months		
			Rate	No. of man-months*	Amount
	Professional Staff				
1.	Team Leader cum Senior Highway Engineer				
2.	Resident cum Highway Engineer				
3.	Senior Bridge Engineer				
4.	Highway cum Pavement Engineer				
5.	Senior Quality cum Material Expert				
6.	Road/traffic Safety Expert				
	Sub – Total				
	Sub-professional				
1.	Survey Engineer				
2	Highway Design Engineer				
3	Assistant Highway Engineer				
4	CAD Expert				
5	Environmental Engineer				
6	Bridge Design Engineer				
7	Assistant Bridge Engineer				
8	Assistant Quality cum Material Engineer				
9	Electrical Engineer				
10	HTMS/Toll Expert				
11	Quantity Surveyor				
12.	Horticulture cum Landscaping Expert				
	Sub Total				
	Total				

For Project with Construction Period of 24 months

No.	Position	Name	Construction Period 24months+DLP 60months		
			Rate	No. of man-months*	Amount
	Professional Staff				
1.	Team Leader cum Senior Highway Engineer				
2.	Resident cum Highway Engineer				
3.	Senior Bridge Engineer				
4.	Pavement cum Highway Engineer				
5.	Senior Quality cum Material Expert				
6.	Road/traffic Safety Expert				
	Sub – Total				
	Sub-professional				
1.	Survey Engineer				
2	Highway Design Engineer				
3	Assistant Highway Engineer				
4	CAD Expert				
5	Environmental Engineer				
6	Bridge Design Engineer				
7	Assistant Bridge Engineer				
8	Assistant Quality cum Material Engineer				
9	Electrical Engineer				
10	HTMS/Toll Expert				
11	Quantity Surveyor				
12.	Horticulture cum Landscaping Expert				
	Sub Total				
	Total				

***The man-month against each key personnel/sub – professional shall be same as specified in Enclosure A of TOR.**

For Standalone Bridge Project:

No.	Position	Name	Construction Period 36months+DLP 60months		
			Rate	No. of man-months*	Amount
	Professional Staff				

1.	Team Leader Cum Senior Bridge Engineer				
2.	Resident cum Pavement Specialist				
3.	Senior Bridge Engineer				
4.	Senior Contract Specialist				
5.	Senior Quality cum Material Expert				
6.	Road/traffic Safety Expert				
	Sub – Total				
	Sub-professional				
1.					
2.					
3.					
4.					
5.					
6.					
7					
8.					
9.					
10.					
	Sub Total				
	Total				

For Standalone Tunnel Project:

No.	Position	Name	Construction Period 60months+DLP 60months		
			Rate	No. of man-months*	Amount
	Professional Staff				
1.	Team Leader cum Senior Tunnel Expert				
2.	Resident Engineer cum Excavation Specialist				
3.	Senior Geotechnical Expert				
4.	Tunnel Design Engineer				
5.	Tunnel Safety Expert				

6.	Senior Geologist				
7.	Senior Contract Specialist				
	Sub – Total				

No.	**Position**	**Name**	**Construction Period 60months+DLP 60months**		
			Rate	**No. of man-months***	**Amount**
	Sub-professional (To be decided by the Authority as per requirement of the Project at the time of preparation of RFP)				
	Sub Total				
	Total				

II. Support Staff

No.	**Position**	**Name**	**Staff Months**		**Billing Rate()**	**Amount( )**
1.	Office Manager	TBN				
2.	Accountant cum Cashier	TBN				
3.	Steno cum Computer Operator	TBN				
4.	Office Boy (1 no)	TBN				
					Total :	

III. Transportation (Fixed rate on rental basis)

The vehicles provided by the Consultants shall include the cost for rental, drivers, operation, maintenance, repairs, insurance, etc. for all complete approx. 3000km/month run

Sr. No	**Description of Vehicles**	**Qty. (No. of vehicle-month)**		**Total**	**Rate/ Vehicle-Month**	**Amount**
		During Construction Period	**During Development and O&M Period**			
1						
2						
	Total					

IV. Duty Travel to Site (FixedCosts) (For all Lengths of projects): Professional and

Sub-Professional Staff

Trips	Number of Trips	Rate*	Amount

* Rate quoted includes Hotel charges, travel cost etc. complete.

V. Office Rent (Fixed Costs)–

Minimum 200 sqm area of office shall be rented. The rent cost includes electricity and water charges, maintenance, cleaning, repairs, etc. complete.

Nos. of Months	Rate/month	Amount
48		

The rent cost includes electricity and water charges, maintenance, cleaning, repairs, etc. complete.

VI. Office Supplies, Utilities and Communication (FixedCosts)

No	Item	Months	Monthly Rate	Amount inRs.
1.	Office Supplies			
2.	Drafting Supplies			
3.	Computer Running Costs			
4.	Domestic and International Communication			

VII. Office Furniture and Equipment(Rental)

The cost shall include rental charges towards all such furniture and equipment as required for proper functioning of office. Office furniture shall include executivetables, chairs, visitorchairs, steel almirahs, computer furniture, conference table etc. Office equipment shall include as a minimum of telephone (2 external & 10 internal lines), photocopier (15ppm, 12000 copies per month with A3 & A4 input) fax machine, PCs (5 No., Intel Core 2 Duo E8300, 19'' colour TFT, Cache-6MB, RAM-2 GB, HDD-250 GB, DVD Writer, Key board, optical scroll mouse, MS- Windows Vista Business, pre-loaded anti-virus etc.), laser printers (2 no., 14 ppm, 266 MHZ, 5000 pages per month, 600x600 dpi or better etc., Engineering Plan printer (1 no.), binding machine (1 no.), plotter A0 size, overhead projector, AC (4 no., 1.5 Ton), Water Coolers (as required) etc.

Nos. of Months	Rate/month	Amount

48		

VIII. Reports and Document Printing

No.	Description	No. of Reports	No. of Copies per Report	Total Nos. of copies	Rate perCopy ( )	Amount
1	Monthly reports (Design and Construction)	84	3	252		
2	Half yearly Reports	8	3	24		
3	Various others reports as provided in the Concession Agreement such as Completion Report					
				Total		

IX. Road Survey Equipment

The cost shall include carrying out survey using equipment, manpower, software and report processing.

Item	Kms	Rate per km (INR)	No of times survey to be conducted	Amount (INR)
Surface defects detection and roughness measurement using Network Survey Vehicle			8	
Pavement strength measurement using FWD			4	
Bridge inspection using Mobile Bridge Inspection Unit or Drone technology			8	
Road signs inspection using Retro Reflectometer			8	
			Total	

X. Contingencies

A fixed amount of Indian Rupees ONE MILLION shall be included in the Financial Proposal. The provisions of Contingency shall be operated with the specific approval from the Competent Authority in <agency>

(Form-IV)

Estimate of Costs for Expatriate Consultants (in Indian Rupees)

I.Remuneration of Expatriate Staff including per Diem allowances

II. Mobilization and Demobilization

1. International Airfares (Fixed costs)

2Inland Travel in Home Country (Fixed Costs)

Lump Sum ……

3. Other Miscellaneous expenses (like DA, internal travel expenses other incidentals)

(Fixed cost)

Lump Sum …….

TENTATIVE QUANTITIES FOR SUB-SOIL INVESTIGATIONS (BORING)

(Form –V)

S.No	Stretch Proposed for DPR	NH No.	Approximate Length (in Km.)	PackageNo.	State	Cumulative Tentative Quantities (in m)	
						In Soils other than hard rock	In hard rock
1	**For projects of length < 110 km <Details of packages>**	**As per List at Annexure-I**	**As per List at Annexure- I**	**As per List at Annexure-I**	**As per List at Annexure-I**	1500	200
2	**For projects of length > 110 km - <Details of packages>**	**As per List at Annexure-I**	**As per List at Annexure- I**	**As per List at Annexure-I**	**As per List at Annexure-I**	2000	300

APPENDIX-V

DETAILED EVALUATION CRITERIA

1. First Stage Evaluation -Proof of Eligibility (Para 12.1 of Data Sheet)

1.1 Eligibility criteria for sole applicant firm.

The sole applicant firm shall satisfy the following criteria.

(a) Firm should have experience of preparation of DPR/Feasibility of 2/4/6 lane of aggregate length as given below. The firm should have also prepared DPR/Feasibility of at least one project of 2/4/6 laning of minimum length as indicated below in the last 7 years.

S.No.	Package No.	Tentative Length	Minimum Aggregate Length required	Minimum length of a Eligible Project (2/4/6lane)	
			DPR/ Feasibility = Tentative Length	DPR = 0.4 xTentative Length	Feasibility = 0.6 xTentative Length
1	2	3	4	5	6

(b) Firm should also have experience of project Authority Engineer/Independent Engineer/Construction supervision of 2/4/6 lanning/Bridge project of aggregate length as given below in the last 7 years.

S.No.	Package No.	TentativeLength	MinimumAggregate Length required	Minimum length of a Eligible Project (2/4/6lane)
			Project Supervision/independent Engineer (Tentative length)	Project Supervision/independent Engineer = 0.4 xTentative Length
1	2	3	4	5

Note: Similar project means 2/4/6 lane as applicable for the project for which RFP is invited. For 2-lane projects experience of 4/6 lane also to be considered with a multiplication factor of 1.5. Experience of 4/6 lane shall be considered interchangeably for 4/6 laning projects. For 4/6 laning projects, experience of 2 lane will be considered with a multiplication factor of 0.4, but only for those 2 lane projects whose cost of consultancy services was more than Rs.1.0 crore for DPR/feasibility study and Rs. 3.0 Crore for supervision.

(a) Annual Average Turn Over for the last 5 years

{In cases where, Audited/Certified copy of Balance Sheet for the FY 2018-19 is available, last five years shall be counted from 2014-15 to 2018-19. However, where audited/certified copy of the Balance Sheet for the FY 2018-19 is not available (as certified by the Statutory auditor) then in such cases last five years shall be considered from 2013-14 to 2017-18} of the firm from Consultancy services should be equal to more than Rs.10 crore.

(In Rs. crore$)

Bidder type	**Annual Turnover**										**Average Annual Turnover (In Rs. crore$)**
	Year 1		**Year 2**		**Year 3**		**Year 4**		**Year 5**		
	(Rs.)	Updation factor	(Rs.)	Updation factor	(Rs.)	Updation factor	(Rs.)	Updation factor	(Rs.)	Updation factor	
1	2	3	4	5	6	7	8	9	10	11	(2x3+4x5+6x7+8x9+10x11)/5
Single entity Bidder or Lead Member including other members of the Joint Venture		**1.00**		**1.05**		**1.10**		**1.15**		**1.20**	

Name & address of Bidder's Bankers:

$*The conversion rate of USD into Rupees shall be the daily representative exchange rates published by the Reserve Bank of India for the relevant date.Where relevant date should be as on the date 28 (twenty eight) days prior to the Application Due Date.*

(Financial Year to be modified as applicable)

1.2 Eligibility criteria for Lead Partner/Other Partner in case of JV.

In case of JV, the Lead Partner should fulfill at least 75% of all eligibility requirements and the other partner shall fulfill at least 50% of all eligibility requirements as given at 1.1 above. Thus a Firm applying as Lead Partner/Other Partner in case of JV should satisfy the following **(a) & (b).** Firm should have experience of preparation of DPR/Feasibility of 4/6 lane of aggregate length as given below. The firm should have also prepared DPR/Feasibility of at least one project of 4/6 laning of minimum length as indicated below in the last 7 years (i.e. from 2011-12 onwards)

(a) Preparation of DPR/Feasibility of 2/4/6 lane of aggregate length as given below.

S. No.	**Package No.**	**Tentative Length**	**Minimum Aggregate Length required**		**Minimum length of a Eligible Project (2/4/6lane)**			
			DPR/ Feasibility = Tentative Length		**DPR = 0.4 xTentative Length**		**Feasibility = 0.6 xTentative Length**	
1	2	3	4		5		6	
			Lead in JV	Other partner in JV	Lead in JV	Other partner in JV	Lead in JV	Other partner in JV

(b) Authority Engineer/Independent Engineer/Construction supervision of 2/4/6 lanning/Bridge project of aggregate length as given below

S.No.	**Package No.**	**TentativeLength**	**MinimumAggregate Length required**		**Minimum length of a Eligible Project (2/4/6lane)**	
			Project Supervision/independent Engineer=Tentative Length		**Project Supervision/independent Engineer = 0.4 xTentative Length**	
1	2	3	4		5	
			Lead in JV	Other partner in JV	Lead in JV	Other partner in JV

c) Minimum Annual Average Turn Over for the last 5years

{ In cases where, Audited/Certified copy of Balance Sheet for the FY 2018-19 is available, last five years shall be counted from 2014-15 to 2018-19. However, where audited/certified copy of the Balance Sheet for the FY 2018-19 is not available (as certified by the Statutory auditor) then in such cases last five years shall be considered from 2013-14 to 2017-18} of a firm applying as Lead Partner/Other Partner in case of JV from Consultancy services should be as given below:

(Financial Year to be modified as applicable)

No.	Mode of Submission by a firm	Annual Average Turn Over for the last 5 years
1	Lead Partner in a JV	Rs.7.5 crore
2	Other Lead partner in a JV	Rs.5 crore

Note: (i) Weightage to be given when experience by a Firm as Sole Firm/Lead Partner in a JV/Other Partner in a JV/As Associate

No.	Status of the firm in carryingout DPR/ Feasibility Study	Weightage for experience
1	Sole firm	100%
2	Lead partner in a JV	75%
3	Other partner in a JV	50 %
4	As Associate	25%

(ii) The experience of a firm in preparation of DPR for a private Concessionaire/contractor shall not be considered, unless certified by the client (Road owning authority)

2. Second Stage Evaluation -Technical Evaluation (Para 12.2 of Data Sheet)

A1. Firm's Profile, turnover and professionals working with the firm (20M)

1	**Specific experience of firms in terms of year**	**7**	
1.1	Less than 5 year		2.5
1.2	5 year to 15 year.		5.0
1.3	15 year to 25 year		6.0
1.4	More than 25 years		7.0
2	**Profile of the Firm**	**3**	
2.1	Partnership /others (Solo /Joint)		1.0
2.2	Private Limited Company and Joint applicant		1.5
2.3	Private Limited Company and sole applicant		2.0
2.4	Public Limited Company and Joint applicant		2.5
2.5	Public Limited Company and sole applicant		3.0
3	**Specific experience of firms in terms of turnover (Updated to the factor as per clause 1.3.2 of LOI)**	**6**	
3.1	Firm Average Turnover of last 5 years >10 but < 20 crore		4.0
3.2	Firm Average Turnover of last 5 years 20 - 50 crore		5.0
3.3	Firm's Average Turnover of last 5 years > 50 crore		6.0
4	**Highway Professionals * working with the firm**	**4**	
4.1	<10 nos.		0
4.2	10-20 nos.		2.0
4.3	> 20-30 nos.		3.0
4.4	> 30 nos.		4.0
***The professionals who possess degree in Civil Engineering/Transport Planning/Transport Economics/Traffic Management/Geology/Environment Science or Engineering and 8 years Experience in highway/bridge/tunnel with employment in the firm for more than one year. The current Employment Certificate/Pay roll details shall be uploaded by Key Personnel on INFRACON.**			

Note:

A. In case feasibility study is a part of DPR services the experience shall be counted in DPR only. In case bridge is included as part of DPR of highway the experience will be (1) and (2)

B. Similar project means 2/4/6 lane as applicable for the project for which RFP is invited. For 2-lane projects experience of 4/6 lane also to be considered with a multiplication factor of 1.5. Experience of 4/6 lane shall be considered interchangeably for 4/6 laning projects. For 4/6 laning projects, experience of 2 lane will be considered with a multiplication factor of 0.4, but only for those 2 lane projects whose cost of consultancy services was more than Rs.1.0 crore for DPR/feasibility study and Rs. 3.0 crore for supervision.

Note: (i) Weightage to be given when experience by a Firm as Sole Firm/Lead Partner in a JV/Other Partner in a JV/As Associate

No.	Status of the firm in carryingout DPR/ Feasibility Study	Weightage for experience
1	Sole firm	100 %
2	Lead partner in a JV	75%
3	Other partner in a JV	50 %
4	As Associate	25%

(ii)The experience of a firm in preparation of DPR for a private Concessionaire/contractor shall not be considered, unless certified by the client (Road owning authority)

A2. Firm's relevant experience in last 7 yearsfor DPR work (15 M)

For standard highways, the following is the break-up:

S.No.	Description	Maximum Marks	Sub-Marks
1	**Specific experience of the DPR consultancy related to the assignment**	**15**	
1.1	**Aggregate Length of DPR / Feasibility study of 2/4/ 6 lane projects**	**5**	
1.1.1	More than the indicative Length of the package applied for		3.0
1.1.2	More than 2 times the indicative length of the package applied for		4.0
1.1.3	More than 3 times the indicative length of the package applied for		5.0
1.2	**DPR for 2/4/6 laning projects each equal to or more than 40 % of indicative length of a package applied for (or Feasibility Study for 2/4/6 laning projects each equal to or more than 60 % of indicative length of a package applied for)**	**5**	
1.2.1	1 project		3.0
1.2.2	2 projects		4.0
1.2.3	≥3 projects		5.0
2	**DPR of Bridge having length more than 200 m**	**5**	
2.1	1 bridge		1.0
2.2	2 bridges		2.0
2.3	3 bridges		3.0
2.4	4 bridges		4.0
2.5	≥5 bridges		5.0

For special projects such as special bridges, tunnels and expressways that require specialized capabilities and skill sets, the following is the break-up:

S. No.	Description	Maximum Marks	Sub-Marks
1	**Specific experience of the DPR consultancy related to the assignment**	**8**	
1.1	**Aggregate Length of DPR / Feasibility study of 2/4/ 6 lane projects**	**4**	
1.1.1	More than the indicative Length of the package applied for		2.0
1.1.2	More than 2 times the indicative length of the package applied for		3.0
1.1.3	More than 3 times the indicative length of the package applied for		4.0
1.2	**DPR for 2/4/6 laning projects each equal to or more than 40 % of indicative length of a package applied for (or Feasibility Study for 2/4/6 laning projects each equal to or more than 60 % of indicative length of a package applied for)**	**4**	
1.2.1	1 project		2.0
1.2.2	2 projects		3.0
1.2.3	≥ 3 projects		4.0
2	**DPR of Bridge having length more than 200 m**	**3**	
2.1	1 bridge		1.0
2.2	2 bridges		1.5
2.3	3 bridges		2.0
2.4	≥4 bridges		2.5
2.5	≥ 5 bridges		3.0
3	**DPR for special category projects (Special bridges/ tunnels or expressways, whichever applicable). It is to be noted that either 3.1 or 3.2 shall be applicable, and not both.**		
3.1	**DPR of number of special bridges/ tunnels (if applicable)**	**4**	
3.1.1	1 project		1
3.1.2	2 projects		2
3.1.3	3 projects		3
3.1.4	≥4 projects		4
3.2	**Aggregate length of DPR/ Feasibility study for expressways**	**4**	
3.2.1	Upto 50 km		1
3.2.2	50km to 100 km		2
3.2.3	100km to 150 km		3
3.2.4	> 150 Km		4

Note: In case feasibility study is a part of DPR services the experience shall be counted in DPR only. In case bridge is included as part of DPR of highway the experience will be (1) and (2)

A3: Firm's relevant experience in last 7 years for Supervision work (15 M).

S. No.	Description	Maximum Marks	Sub-Marks
1	Specific Experience as Authority Engineer/Independent Engineer /Construction supervision in aggregate length of Highway Projects of 2/4/6-laning	**5**	
1.1	More than the indicative Length of the package applied for -		**3.0**
1.2	More than 2 times the indicative length of the package applied for-		**4.0**
1.3	More than 3 times the indicative length of the package applied for-		**5.0**
2	Specific Experience as Authority Engineer/Independent Engineer /Construction supervision in Number of HighwayProjects of 2/4/6-laning**of length (40%of project length) or more in last 7 years.	**5**	
2.1	1 project		**3.0**
2.2	2 Project		**3.5**
2.3	3 Project		**4.0**
2.4	4 Project		**4.5**
2.5	5 Project or more		**5.0**
3	Experience in Construction Supervision of major structures having length of more than 200 meter in last 7 years.	**5**	
3.1	1 project		**3.0**
3.2	2 Project		**3.5**
3.3	3 Project		**4.0**
3.4	4 Project		**4.5**
3.5	5 Project or more		**5.0**
4	Additional requirement in case of specialized projects***	***	

Note 1: In case of JV the turnover and experience details of Lead and JV partners to be added.

Note 2: Employer's certificate/ certificate from Statutory Auditor should be submitted substantiating the experience/turnover claimed by the firm.

*** In case the project includes any specialized nature of work such as tunnels, specialized structures etc. in substantial quantum, this requirement/Marks may be included by suitably adjusting marks of other attributes.

B1. Material testing, survey and investigation, equipment and software proposed to be used (10M)

S.No.	Description	Maximum Marks	Sub-Marks
1	**Availability of Material Testing Facilities with persons/resources having operational skills of the equipment**	**1.5**	
1.1	Owned* (Available In House)		1.5
1.2	Outsourced (Hire basis)		1
*** Shall be ascertained through the ownership evidence uploaded on INFRACON in regard to major equipments required for testing of materials to be used for construction of Highway Project.**			
2	**Availability of Field Investigation Facilities with persons/resources having operational skills of the equipment**	**1**	
2.1	Owned** (Available In House)		1
2.2	Outsourced (Hire basis)		0.5
**** Shall be ascertained through ownership evidence uploaded on INFRACON for construction of Highway Project.**			
3	**Availability of Office Equipment and Software with persons/resources having operational skills of the equipment**	**1.5**	
3.1	Owned*** (Available In House)		1.5
3.2	Outsourced (Hire basis)		1
***** Shall be ascertained through ownership evidence uploaded on INFRACON for key hardware/software required for Highway consultancy assignment.**			
4	**Experience in LiDAR or better technology for topographic survey (Infrastructure sector)**	**2.5**	
4.1	1 project		0.5
4.2	2 projects		1
4.3	3 projects		1.5
4.4	4 projects		2
4.5	≥ 5 projects		2.5
5	**Experience in using GPR and Induction Locator or better technologies for detection of sub-surface utilities (Infrastructure sector)**	**2**	
5.1	1project		0.5
5.2	2 projects		1
5.3	3 projects		1.5
5.4	≥ 4 projects		2
6	**Experience in digitization of cadastral maps for land surveys**	**1.5**	
6.1	Area upto 100 ha		0.5
6.2	Area between 100-500 ha		1
6.3	Area > 500 ha		1.5

Note: The experience of firm/associate in Lidar or equivalent technology, GPR and Induction Locator or equivalent technologies and Experience in digitization of cadastral maps for land acquisition shall be supported by experience certificate. The experience of a firm/ associate in Lidar or equivalent technology, GPR and Induction Locator or equivalent technologies and Experience in Digitization of cadastral maps for land acquisition for a private concessionaire/ contractor (client) shall be considered on self-certification along with the client certificate **of Government agencies not below the rank of EE/PD/GM or eqivalant officer.** Any false certification shall attract provisions of Clause 1.8, Section -2 (letter of Invitation) read with Clause 2.9.1(g) of GCC

B2: Experience in use of technology for road inspection in supervision work (10M)

S. No	Description		Maximum Marks
1	Experience in Network Survey Vehicle(NSV) or better technology for pavement inspection		3.5
1.1	Equipment		2
	(a) Equipment on MOU on hiring basis- 1 marks		
	(b) Own Equipment – 2 marks		
1.2	Experience		1.5
(i)	1-2 projects	0.5	
(ii)	3-5 projects	1	
(iii)	> 5 projects	1.5	
2	Experience in Falling Weight Deflectometer (FWD) or better technology for pavement strength measurement		2
2.1	Equipment		1
	(a) Equipment on MOU on hiring basis- 0.5 mark		
	(b) Own Equipment – 1 marks		
2.2	Experience		1
(i)	1-3 Projects - 0.5 marks		
(ii)	>3 Projects- 1 marks		
3	Experience in Mobile Bridge Inspection Unit or better		2.5
3.1	Equipment		1
	(a) Equipment on MOU on hiring basis- 0.5 mark		
	(b) Own Equipment – 1 marks		
3.2	Experience		1.5
(i)	1-2 Projects- 0.5 marks		
(ii)	3-5 Projects- 1 marks		
(iii)	> 5 Projects- 1.5 marks		
4	Experience in Retro reflectometer technology		2
4.1	Equipment		1
	(a) Equipment on MOU on hiring basis- 0.5 mark		
	(b) Own Equipment – 1 marks		
4.2	Execution with owned/hired Equipment		1
(i)	1-3 Projects - 0.5 marks		
(ii)	>3 Projects – 1 marks		
	Total		10

Notes:

(iii) The Consultants owning the equipment shall be required to submit proof of ownership.

(iv) The experience of firm/associate in NSV or equivalent technology, FWD or equivalent technology, MBIU or equivalent technology and Retro reflectometer or equivalent technology shall be supported by experience certificate. The experience of a firm/associate for a private concessionaire/ contractor (client) shall be considered on self-certification along with the client certificate **of Government agencies not below the rank of EE/PD/GM or eqivalant officer.** Any false certification shall attract provisions of Clause 1.8, Section -2 (letter of Invitation) read with Clause 2.9.1(g) of GCC

C1. Qualification and Competence of the Key Staff for adequacy of the Assignment for

phase 1 & 2 (Project preparation and pre construction activity). (Para 12.2 of Data Sheet and Enclosure II of TOR)

C1.1 TEAM LEADER cum SENIOR HIGHWAY ENGINEER

S. No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Degree in Civil Engineering or equivalent [AICTE Approved]		20
ii)	Post Graduation in HighwayEngg. / Structures / Traffic and Transportation / SoilMechanics and Foundation Engineering / Construction Management / Transportation [AICTE Approved]		5
II	**Relevant Experience & Adequacy for the Project**		**70**
a)	**Total Professional Experience**		**15**
	<15years	0	
	15-18 years	11	
	>18-21 years	13	
	>21 years	15	
(b)	**Experience in Highway Projects-Experience in Planning, project preparation and design of Highway (2/4/6 laning of NH/SH/Expressways)**		**7.5**
	<6 years	0	
	6-8 years	5.5	
	>8-10 years	6.5	
	>10 years	7.5	
(c)	**Experience in Highway Projects-Experience in Construction Supervision/AE/IEfor Projects (2/4/6 laning of NH/SH/Expressways)**		**7.5**
	<6 years	0	
	6-8 years	5.5	
	>8-10 years	6.5	
	>10 years	7.5	
d)	**Experience in Similar Capacity**		**40**
(i)a	**In Feasibility of 2/4/6 laning works or DPR of major highway projects i.e. 2/4/6 laning of NH/SH/Expressways in Similar Capacity (Minimum Aggregate length of 40 km)**		10
	< 40km	0	
	40km-80 km	4	
	80 km-150km	8	
	>150km-250km	9	
	> 250km	10	
(i)b	**In Construction Supervision/IC of major highway projects i.e. 2/4/6 laning of NH/SH/Expressways in Similar Capacity (**		10

S. No.	Description		Max. Marks
	Minimum Aggregate length of 40 km)		
	< 40km	0	
	40 km-70km	8	
	>70km-100km	9	
	> 100km	10	
(ii)a	**In Feasibility of 2/4/6 laning works or DPR of major highway projects (of length 40% of project length or more of similar configuration) i.e. 2/4/6 laning of NH/SH/Expressways in Similar Capacity- Number of Projects (full time)**		10
	< 2 projects	0	
	2 projects	8	
	3- 5 projects	9	
	> 5 projects	10	
(ii)b	**In Construction Supervision/IC of major highway projects (of length 40% of project length or more of similar configuration) i.e. 2/4/6 laning of NH/SH/Expressways in Similar Capacity- Number of Projects (full time deployment)**		10
	< 1 projects	0	
	1 project	4	
	2 projects	8	
	3- 5 projects	9	
	> 5 projects	10	
III	**Employment with Firm**		**5**
	Less than 1 Year	0	
	1 year	3.0	
	Add 0.5 marks for each subsequent year subject to maximum of 2.0 marks		
	Total		**100**

C1.2 HIGHWAY cum PAVEMENT ENGINEER

S.No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Degree in Civil Engineering or equivalent [AICTE Approved]		20
ii)	Post graduation in Highway Engg / Transportation Engineering [AICTE Approved]		5
II	**Relevant Experience & Adequacy for the Project**		**70**
a)	**Total Professional Experience**		**15**
	<8years	0	
	8-12 years	11	
	>12-15 years	13	
	>15 years	15	
(b)	**Experience in Highway Projects - Experience in Design/ Pavement Design ofHighway Projects (2/4/6 laning of NH/SH/Expressways)**		**25**
	<6 years	0	
	6-10years	19	
	>10-15 years	22	
	>15years	25	
(C)	**Experience in Similar Capacity**		**30**
(i)	**In Design/ Pavement Design of Highway Projects (2/4/6 laning ofNH/SH/Expressways) in Similar Capacity (Minimum aggregate length 80 km)**		20
	<80km	0	
	80km-150km	15	
	>150km-250km	17	
	>250km	20	
(ii)	**In Design/Pavement Design of Highway Projects (2/4/6 laning of NH/SH/ Expressways) in Similar Capacity – Number of Projects**		10
	2 projects	8	
	3- 5 projects	9	
	> 5 projects	10	
III	**Employment with Firm**		**5**
	Less than 1 Year	0	
	1 year	3	
	Add 0.5 marks for each subsequent year subject to maximum of 2.0 marks		
	Total		**100**

C1.3 SENIOR BRIDGE ENGINEER

S. No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Degree in Civil Engineering or equivalent [AICTE Approved]		20
ii)	Post Graduation in Structural Engineering/ Bridge		5
II	**Relevant Experience & Adequacy for the Project**		**70**
a)	**Total Professional Experience**		**15**
	<10 years	0	
	10-12years	11	
	>12-15 years	13	
	>15 years	15	
b)	**Experience in Bridge Projects**		**25**
(i)	**Experience in project preparation and design of bridge projects**		20
	<8 years	0	
	8-10 years	15	
	>10-12 years	17	
	>12years	20	
(ii)	**Experience of 2/4 lane configuration bridges**		5
	<2 Projects	0	
	2-4 Projects	4	
	> 4 projects	5	
c)	**Experience as Senior Bridge Engineer or Similar Capacity in Highway Design Consultancy Projects (2/4/6 laning of NH/SH/Expressways) involving design of Major Bridges (minimum 2 nos. of length more than 200m)**		**30**
	<2 numbers	0	
	2-4 numbers	24	
	5-6 numbers	27	
	> 6 numbers	30	
III	**Employment with Firm**		**5**
	Less than 1 Year	0	
	1 year	3	
	Add 0.5 marks for each subsequent year subject to maximum of 2 marks		
	Total		**100**

C1.4 Road/Traffic Safety Expert

S. No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Degree in Civil Engineering[AICTE Approved]		20
ii)	Post graduation in Traffic Engineering /Transportation Engineering /Transportation Planning[AICTE Approved]		5
II	**Relevant Experience & Adequacy for the Project**		**70**
a)	**Total Professional Experience**		**15**
	<6 years	0	
	6-10years	11	
	>10-15 years	13	
	>15years	15	
b)	**Experience in Highway Projects – Experience on Similar Projects (2/4/6 laning of NH/SH/ Expressways)**		**25**
	<5years	0	
	5-6years	19	
	>6-10 years	22	
	>10years	25	
c)	**Experience as Traffic and Safety Expert / Traffic Engineer or in Similar Capacity in Highway Projects (2/4/6 laning of NH/SH/Expressways) (Minimum aggregate length 80 km)**		**30**
	<80km	0	
	80km-150km	24	
	>150km -250km	27	
	>250km	30	
III	**Employment with Firm**		**5**
	Less than 1 Year	0	
	1 year	3	
	Add 0.5 marks for each subsequent year subject to maximum of 2 marks		
	Total		**100**

C1.5 MATERIAL ENGINEER cum GEOTECHNICAL ENGINEER cum GEOLOGIST

S. No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Degree in Civil Engineering /M. Sc. in Geology[AICTE Approved]		20
ii)	Post graduation in Foundation Engineering / Soil Mechanics / Geo Tech Engineering or Phd in Geology[AICTE Approved]		5
II	**Relevant Experience & Adequacy for the Project**		**70**
a)	**Total Professional Experience**		**15**
	<10 years	0	
	10-12 years	11	
	>12-15 years	13	
	>15 years	15	
b)	**Experience in Highway Projects–In Similar Projects (2/4/6 laning of NH/SH/Expressways) in design and or Construction/ Construction Supervision**		**25**
	<7 years	0	
	7-10 years	19	
	>10 -12 years	22	
	>12years	25	
c)	**Experience as Material cum Geo-technical Engineer or in Similar capacity on Highway Projects (2/4/6 laning of NH/SH/Expressways) (Minimum aggregate length 80 km)**		**30**
	<80km	0	
	80km-150km	24	
	>150km – 250km	27	
	>250km	30	
III	**Employment with Firm**		**5**
	Less than 1 Year	0	
	1 year	3	
	Add 0.5 marks for each subsequent year subject to maximum of 2 marks		
	Total		**100**

C1.6 SENIOR SURVEY ENGINEER

S. No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Degree or equivalent in Civil Engineering / Diploma in Civil Engineering /Diploma in Surveying [AICTE Approved]		20
ii)	Post Graduation in Survey Engineering / Surveying / Remote Sensing [AICTE Approved]		5
II	**Relevant Experience & Adequacy for the Project**		**70**
a)	**Total Professional Experience**		**15**
	<10 years	0	
	10-12 years	11	
	>12-15 years	13	
	>15 years	15	
b)	**Experience in Highway Projects**		**25**
i)	**Experience in Similar Projects (2/4/6 laning of NH / SH / Expressways) in project preparation/ Construction / Construction Supervision**		20
	<8years	0	
	8 -10 years	15	
	>10-12 years	17	
	>12 years	20	
ii)	**Knowledge and understanding of modern Computer based method of Surveying**		**5**
	Yes	5	
	No	0	
c)	**Experience as Survey Engineer or in Similar Capacity for project preparation of highway project (2/4/6 laning of NH/SH/Expressways) (Minimum Aggregate Length 80km)**		**30**
	<80km	0	
	80km-150km	24	
	>150km-250km	27	
	>250km	30	
III	**Employment with Firm**		**5**
	Less than 1 Year	0	
	1 year	3	
	Add 0.5 marks for each subsequent year subject to maximum of 2 marks		
	Total		**100**

C1.7 ENVIRONMENTAL SPECIALIST

S. No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Degree in Civil Engineering / Environmental Engineering or Post Graduate in Environmental Sciences [AICTE Approved]		20
ii)	Post-Graduation in Environmental Engineering [AICTE Approved]		5
II	**Relevant Experience & Adequacy for the Project**		**70**
a)	**Total Professional Experience**		**15**
	<6 years	0	
	6-8 years	11	
	>8-10 years	13	
	>10 years	15	
b)	**Experience in Highway Projects- Experience in Environment impact assessment of Highway Projects (2/4/6 laning of NH/SH/Expressways)**		**25**
	<5 years	0	
	5 -7 years	19	
	>7-10 years	22	
	>10 years	25	
c)	**Experience as Environmental Specialist or in Similar Capacity in Highway Projects (2/4/6 laning of NH/SH/Expressways)**		**30**
	<2 projects	0	
	2- 4 projects	24	
	5-7 projects	27	
	>7 projects	30	
III	**Employment with Firm**		**5**
	Less than 1 Year	0	
	1 year	3	
	Add 0.5 marks for each subsequent year subject to maximum of 2 marks		
	Total		**100**

C1.8 QUANTITY SURVEYOR/DOCUMENTATION EXPERT

S. No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Graduation or equivalent in Civil Engineering / Certificate course from 'Institution of Quantity Surveying'[AICTE Approved]		20
ii)	Graduation or equivalent in Civil Engineering [AICTE Approved]		5
II	**Relevant Experience & Adequacy for the Project**		**70**
a)	**Total Professional Experience**		**15**
	<10 years	0	
	10-12 years	11	
	>12-15 years	13	
	>15 years	15	
b)	**Experience in Highway Projects- Experience in preparation of Bill of Quantities, Contract documents and documentation for major highway projects (2/4/6 laning of NH/SH/Expressways)**		**25**
	<8 years	0	
	8 -10 years	19	
	>10-12 years	22	
	>12 years	25	
c)	**Experience as Quantity Surveyor / Documentation Expert or in Similar Capacity in Highway Projects(2/4/6 laning of NH/SH/Expressways) (Minimum Aggregate length of 80km)**		30
	<80km	0	
	80km-150km	24	
	>150km – 250km	27	
	>250km	30	
III	**Employment with Firm**		**5**
	Less than 1 Year	0	
	1 year	3	
	Add 0.5 marks for each subsequent year subject to maximum of 2 marks		
	Total		**100**

C1.9 LAND ACQUISITION EXPERT

S. No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Graduation or equivalent		20
ii)	Post Graduation		5
II	**Relevant Experience & Adequacy for the Project**		**70**
a)	**Total Professional Experience**		**15**
	<15 years	0	
	15-17 years	11	
	>17-20 years	13	
	>20 years	15	
b)	**Experience in Land Acquisition works of Government/Authority**		**20**
	<10 years	0	
	10 -12 years	15	
	>12-15 years	17	
	>15 years	20	
c)	**Experience in Land Acquisition works in Highway/road sector**		25
	Nil project	0	
	1 project	19	
	2 projects	22	
	3 projects	25	
d)	Retired Revenue officer at the level of ADM/SDM / Tehsildar		10
III	**Employment with Firm**		**5**
	Less than 1 Year	0	
	1 year	3	
	Add 0.5 marks for each subsequent year subject to maximum of 2 marks		
	Total		**100**

C1.10 UTILITY EXPERT

S. No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Graduation or equivalent		20
ii)	Post Graduation		5
II	**Relevant Experience & Adequacy for the Project**		**70**
a)	**Total Professional Experience**		**15**
	<10 years	0	
	10-12 years	11	
	>12-15 years	13	
	>15 years	15	
b)	Experience in Utility estimation and its laying/ erection		**30**
	<8 years	0	
	8 -10 years	24	
	>10-12 years	27	
	>12 years	30	
c)	Experience in Utility shifting estimation and its laying/ erection along Highway/ roads		25
	Nil project	0	
	1 project	19	
	2 projects	22	
	3 projects	25	
III	**Employment with Firm**		**5**
	Less than 1 Year	0	
	1 year	3	
	Add 0.5 marks for each subsequent year subject to maximum of 2 marks		
	Total		**100**

C1.11 TEAM LEADER cum SENIOR BRIDGE ENGINEER

S. No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Degree in Civil Engineering or equivalent [AICTE Approved]		20
ii)	Post Graduation in Structural Engineering, Degree/Diploma/Certificate in Construction Management		5
II	**Relevant Experience & Adequacy for the Project**		**70**
a)	**Total Professional Experience**		**15**
	<15 years	0	
	15-18 years	11	
	>18-21 years	13	
	> 21 years	15	
(b)	**Experience in major Bridge Project –Experience in major Bridge Design/Construction / Development Project**		**25**
	< 5 years	0	
	6-8 years	19	
	>8-10 years	22	
	>10 years	25	
c)	**Experience in Similar Capacity**		**30**
(i)	**As Team Leader/Project Manager or similar capacity of atleast two major bridge of a length 500 mtr. (Excluding approaches) in Construction Supervision / IC.**		20
	< 2 projects	0	
	2 projects	15	
	3- 5 projects	18	
	> 5 projects	20	
(ii)	**As Team Leader/Project Manager or similar capacity of atleast two major bridge of a length 500 mtr. (Excluding approaches) in DPR/ Feasibility Study.**		10
	< 2 projects	0	
	2 projects	8	
	3- 5 projects	9	
	> 5 projects	10	
III	**Employment with Firm**		**5**
	> 1 Year	0	
	1 year	3	
	Add 0.5 marks for each subsequent year subject to maximum of 2 marks		
	Total		**100**

C1.12 Bridge Structural Engineer

S. No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Degree in Civil Engineering or equivalent[AICTE Approved]		20
ii)	Post Graduation in Structural Engineering/ Bridge Engineering[AICTE Approved]		5
II	**Relevant Experience & Adequacy for the Project**		**70**
a)	**Total Professional Experience**		**15**
	<8 years	0	
	8-10 years	11	
	>10-15=12 years	13	
	>12 years	15	
b)	**Experience in Bridge Projects**		**25**
(i)	**Experience in project preparation and design of bridge projects**		25
	<5 years	0	
	5-8 years	19	
	>8-10 years	22	
	>10 years	25	
c)	**Experience as Bridge Engineer or Similar Capacity in Highway Design Consultancy Projects (2/4/6 laning of NH/SH/Expressways) involving design of Major Bridges (minimum 2 nos. of length more than 200m)**		**30**
	<2 numbers	0	
	2-4 numbers	24	
	5-6 numbers	27	
	> 6 numbers	30	
III	**Employment with Firm**		**5**
	Less than 1 Year	0	
	1 year	3	
	Add 0.5 marks for each subsequent year subject to maximum of 2 marks		
	Total		**100**

C1.13Team Leader cum Senior Tunnel Expert

S. No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Degree in Civil Engineering/Tunnel Engineering / Mining Engineering		20
ii)	Post Graduation in Civil Engineering /Tunnel Engineering/Mining Engineering		5
II	**Relevant Experience & Adequacy for the Project**		**65**
a)	**Total Professional Experience**		10
	<20 years	0	
	20-25 years	8	
	>25-28 years	9	
	>28 years	10	
(b)	**Experience in Tunnel Projects**		**40**
	(i) Professional experience in handling major tunnel projects (Road/Rail/Metro)		8
	<12 years	0	
	>=12 – 14 years	6	
	>14 – 15 years	7	
	>15years	8	
	(ii) Experience in major tunnel construction/construction supervision projects (Road/Rail/Metro)		8
	<6 years	0	
	>=6 – 8 years	7	
	>8 years	8	
	(iii)Experience in reviewing of DPR or Feasibility report of major tunnel projects(Road/Rail/Metro)		8
	<6 years	0	
	>=6 – 8 years	7	
	>8 years	8	
	(iv) Experience in DPR reviewing of minimum aggregate tunnel length of 1.0 km		8
	<1.0 km	0	
	1.0 km-2.5 km	6	
	more than 2.5 km	8	
	(v) Experience in construction/construction supervision/ reviewing of DPR/feasibility report of major tunnel projects (Road/Rail/metro) using NATM		8

S. No.	Description		Max. Marks
	<10 years	0	
	>=10 – 12 years	7	
	>12 years	8	
c)	**Experience in Similar Capacity**		**15**
	(i) Experience as Team Leader or similar capacity in major tunnel construction/construction supervision projects (Road/Rail/Metro)		7
	=2 projects	5	
	= 3 to 5 projects	6	
	> 5 or more	7	
	(ii) Experience as Team Leader or similar capacity in reviewing of DPR or Feasibility report of major tunnel projects(Road/Rail/Metro)		8
	=2 projects	6	
	= 3 to 5 projects	7	
	> 5 or more	8	
III	**Employment with Firm**		**10**
	Less than 1 Year	0	
	1-2 years	7.5	
	Add 0.5 marks for each subsequent year subject to maximum of 2.5 marks		
	Total		**100**

C1.14Tunnel Design Expert

Sr. No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Degree in Civil/ Mining Engineering		20
ii)	Post Graduation in Design/Structural Engineering or equivalent		5
II	**Relevant Experience & Adequacy for the Project**		**65**
a)	**Total Professional Experience**		10
	<15 years	0	
	15-20 years	8	
	>20 -25years	9	
	>25years	10	
b)	**Experience in Tunnel Projects**		**24**
	(i) Professional Experience in handling major tunnel projects (Road/Rail/Metro)		8
	<10 years	0	
	>=10-12 years	6	
	>12 -14 years	7	
	>14 years	8	
	(ii) Experience of major tunnel construction/construction supervision projects (Road/Rail/Metro)		8
	<10 years	0	
	>=10-12 years	6	
	>12 -14 years	7	
	>14 years	8	
	(iii) Experience in preparation of DPR or Feasibility report of major tunnel projects(Road/Rail/Metro)		8
	<10 years	0	
	>=10-12 years	6	
	>12 -14 years	7	
	>14 years	8	
c)	**Experience in Similar Capacity**		**31**
	(i) Professional Experience as Tunnel Design Engineer (Structural)		8
	<8 years	0	
	>=8-10 years	6	

Sr. No.	Description		Max. Marks
	>10 – 12 years	7	
	>12 years	8	
	(ii) Experience as Tunnel Design Engineer (Structural) of major tunnel construction/construction supervision projects (Road/Rail/Metro)		8
	<8 years	0	
	>=8 – 10 years	6	
	>10-12 years	7	
	>12 years8	8	
	(iii) Experience as Tunnel Design Engineer (Structural) of major tunnel for preparation of DPR projects (Road/Rail/Metro)		8
	<8 years	0	
	>=8 – 10 years	6	
	>10-12 years	7	
	>12 years	8	
	(iv)Experience as Tunnel Design Engineer (Structural) in preparation of DPR/ Feasibility report of major tunnel projects (Road/Rail/Metro) using NATM		**7**
	< 3 projects	0	
	>=3-5 projects	6	
	5 or more projects	7	
III	**Employment with Firm**		**10**
	Less than 1 Year	0	
	1-2 years	7.5	
	Add 0.5 marks for each subsequent year subject to maximum of 2.5 marks		
	Total		**100**

C1.15 Senior Geotechnical Engineer

S. No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Degree in Civil Engineering/Mining Engineering / Engineering Geology		20
ii)	Post Graduation in Geotechnical Engineering /Foundation Engineering/Rock Mechanics/Geo science or equivalent		5
II	**Relevant Experience & Adequacy for the Project**		**65**
a)	**Total Professional Experience**		10
	<15 years	0	
	15-20 years	8	
	>20 -25years	9	
	>25years	10	
(b)	**Experience in Tunnel Projects**		**24**
	(i) Professional experience in handling major tunnel projects (Road/Rail/Metro)		8
	<10 years	0	
	>=10-12 years	6	
	>12 -14 years	7	
	>14 years	8	
	(ii) Experience in major tunnel construction/construction supervision projects (Road/Rail/Metro)		8
	<10 years	0	
	>=10-12 years	6	
	>12 -14 years	7	
	>14 years	8	
	(iii)**Experienceinpreparation of DPR or Feasibility report of major tunnel projects(Road/Rail/Metro)**		8
	<10 years	0	
	>=10-12 years	6	
	>12 -14 years	7	
	>14 years	8	
c)	**Experience in Similar Capacity**		**31**
	(i) Professional Experience as Tunnel Design Engineer (Structural)		**8**
	<8 years	0	

S. No.	Description		Max. Marks
	>=8-10 years	6	
	>10 – 12 years	7	
	>12 years	8	
	(ii) Experience as Senior Geotechnical Engineer or similar capacity in major tunnel construction/construction supervision projects (Road/Rail/Metro)		**8**
	<8 years	0	
	>=8 – 10 years	6	
	>10-12 years	7	
	>12 years	8	
	(iii) Experience as Senior Geotechnical Engineer or similar capacity in preparation of DPR or Feasibility report of major tunnel projects (Road/Rail/Metro)		**8**
	<8 years	0	
	>=8 – 10 years	6	
	>10-12 years	7	
	>12 years8	8	
	(iv) Experience in construction/construction supervision/ preparation of DPR/feasibility report of major tunnel projects (Road/Rail/metro) using NATM		**7**
	<8 years	0	
	>=8 – 10 years	6	
	>10-12 years	7	
	<8 years	0	
III	**Employment with Firm**		**10**
	Less than 1 Year	0	
	1-2 years	7.5	
	Add 0.5 marks for each subsequent year subject to maximum of 2.5 marks		
	Total		**100**

C1.16 Senior Geophysicist

Sr. No.	Description		Max. Marks
I	**General Qualification**		**25**
i)	Graduate in Geophysics/Geo science/ Earth science or equivalent		20
ii)	Post Graduation in Geophysics/Geo science/ Earth Scienceor equivalent		5
II	**Relevant Experience & Adequacy for the Project**		**65**
a)	**Total Professional Experience**		15
	<15 years	0	
	15-20 years	10	
	>20 -25years	13	
	>25years	15	
b)	**Experience in Relevant works**		**50**
	(i) Professional Experience in handling tunnel/ mineral and oil exploration projects		12
	<10 years	0	
	>=10-12 years	9	
	>12 -14 years	11	
	>14 years	12	
	(ii) Experience of carrying out AEM survey for tunneling/ mineral and oil exploration or any other similar work for area of more than 2.7 sq km		12
	< 2 projects	**0**	
	2 projects	9	
	3 projects	11	
	4or more projects	12	
	(iii) Processing, Interpreting, generating 3D resistivity model of AEM survey's raw data for tunneling/ mineral and oil exploration or any other similar work for area of more than 2.7 sq km		12
	< 2 projects	**0**	
	2 projects	9	
	3 projects	11	
	4or more projects	12	
	(iv) Experience in carrying out AEM survey, processing, interpreting, generating 3D resistivity of AEM survey's raw data for major tunnel work (Rail/Road/Metro)		14
	< 3 projects	**0**	

Sr. No.	Description		Max. Marks
	3 projects	9	
	4 projects	12	
	5or more projects	14	
II	**Employment with Firm**		**10**
	Less than 1 Year	0	
	1-2 years	7.5	
	Add 0.5 marks for each subsequent year subject to maximum of 2.5 marks		
	Total		**100**

Assumptions to be made regarding Similar Capacity for various positions

1.	**Team Leader cum Senior Highway Engineer**	
i)	On behalf of Consultant / Contractor:	Team Leader/Resident Engineer/Project Manager/Senior Highway Engineer.
ii)	In Government Organizations:	Superintending Engineer (or equivalent) and above
2.	**Senior Bridge Engineer**	
i)	On behalf of Consultant:	Senior Bridge Engineer/Bridge Engineer/Bridge Design Engineer
ii)	In Government Organizations:	Executive Engineer (or equivalent) and above
3.	**Highway cum Pavement Engineer**	
i)	On behalf of Consultant:	Highway Engineer/Highway Design Engineer/Pavement Engineer.
ii)	In Government Organizations:	Executive Engineer (or equivalent) and above
4.	**Material Engineer cum Geo Technical Engineer- Geologist**	
i)	On behalf of Consultant:	Material Engineer/Material Expert/Geo Technical Engineer
ii)	In Government Organizations:	Executive Engineer (or equivalent) and above Material Engineer/Material Expert/Geo Technical Engineer/Manager (Material)

5.	**Road/TrafficSafety Expert**	
i)	On behalf of Consultant:	Traffic Engineer/Transportation Engineer/Road Safety Expert
ii)	In Government Organizations: Executive Engineer (or equivalent) and above	
iii)	On behalf of Contractor:	Traffic Engineer/Transportation Engineer/ Road Safety Expert
6.	**Senior Survey Engineer**	
i)	On behalf of Consultant:	Senior Survey Engineer/ Survey Engineer/ Senior Surveyor
ii)	In Government Organizations:	Surveyor/Engineer (or equivalent)
iii)	On behalf of Contractor:	Senior Survey Engineer/Survey Engineer/ Senior Surveyor
7.	**Environmental Specialist**	
i)	On behalf of Consultant /Contractor:	Environmental Engineer/ EnvironmentalSpecialist/ Environmental Expert
ii)	In Government Organization:	Officers who has dealt environment/forest matter.
8.	**Quantity Surveyor/Documentation Expert**	
i)	On behalf of Consultant /Contractor:	Quantity Surveyor
(ii)	In Government Organizations:	Assistant Engineer (or equivalent)
9.	**Land Acquisition Expert**	
i)	On behalf of Consultant /Contractor:	Land Acquisition Expert
(ii)	In Government Organizations:	ADM, SDM, Tehsildar,
10.	**UTILITY Expert**	
i)	On behalf of Consultant /Contractor:	Utility Expert

(ii) In Government Organizations: Executive Engineer (or equivalent) and above.

11. **Team Leader cum Senior Tunnel Expert**

i) On behalf of the Consultant/Contractor:	Team Leader/Senior Highway Engineer.
ii) In Government Organizations:	Superintending Engineer (or equivalent) and above

12. Tunnel Design Engineer

i) On behalf of the Consultant/Contractor:	Tunnel Design Engineer
ii) In Government Organizations:	----------

13. Senior E&M Expert

i) On behalf of the Consultant/Contractor:	Senior E&M Expert (Tunnels)
ii) In Government Organizations:	----------

14. Senior Geologist:

i) On behalf of the Consultant/Contractor:	Geologist
ii) In Government Organizations:	Geologist

15. Material Engineer

i) On behalf of the Consultant/Contractor:	Material Engineer/ Material Expert
ii) In Government Organizations:	Executive Engineer (or equivalent) and above

Consultant has to assess the major utility shifting involved and propose the CV accordingly.

Note: While carrying out evaluation of key personnel, the experience in similar capacity is also a criteria of evaluation and assumptions to be made regarding similar capacity have been mentioned above. However, if a key personnel has worked in next lower category to the similar capacity, the marks allotted to key personnel in the category 'experience in similar capacity' shall be reduced to two thirds of marks in this category. This shall be applicable for evaluation of all key personnel.

C2. Evaluation Criteria for assessment of score of Key Staff for adequacy of the Assignment for phase 3 Construction Supervision and Maintenance

C2.1 Resident cum Highway Engineer

S. No.	Description		Max. Marks	Reference/Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
1	General Qualification		25		
i)	Graduate in Civil Engineering	21			
ii)	Post Graduation in Highway Engineering / Construction Management / Geotechnical Engineering / Transportation Engineering / Structural Engineering	04			
2	Adequacy for the Project		70		
	Professional Experience				
i)	Total Professional Experience in handling Highway projects < 12 years -0 12 years -8 marks Add 1 mark extra for each additional year of experience subject to maximum 2 (two) marks.		20		
ii)	Experience as Resident Engineer/Project Director/Project Manager/Superintending Engineer or equivalent/Executive Engineer or equivalent on construction works/Authority Engineer/Independent Engineer Projects (similar configuration (2/4/6 laning*) and above). < 5 years -0; 5 years -15 marks Add 1 marks extra for each additional year of experience subject to maximum 5 (five) marks.		20		
iii)	Experience in similar capacity in handling major 2/4/6-laning** projects (of length 40% of project length or more of similar configuration (2/4/6 laning**) and above) < 2 nos. -0 2 nos. -19 marks Add three marks extra for each additional project subject to maximum 6 (Six) marks.		25		
iv)	Experience in similar capacity of Highway Project of Construction/Construction Supervision/IC on EPC Mode (of length 40% of project length or more of similar configuration (2/4/6 laning**) and above) 1 Project- 4 marks Add 1 (one) mark extra for each additional project subject to maximum 1 (one) mark		5		
3	Employment with the Firm < 1 year -0		5		

S. No.	Description	Max. Marks	Reference/Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
	1 year – 3 marks Add 0.5 marks for each subsequent year subject to maximum 2 marks			
	Total :	100		

Note:

(1) Similar Capacity includes the following positions

i) On behalf of Consultant: Resident / Highway Engineer

ii) On behalf of Contractor: Resident Engineer/ Highway Engineer / Project Manager (Construction/Construction Supervision)

iii) In Government Organizations: Executive Engineer (or equivalent) and above

(2) Only those projects (in numbers) will be considered for evaluation above, where the input of the personnel is not < 12 months

(3) In case of experience on behalf of Authority's Engineer or Contractor, the experience shall be duly endorsed by the respective Government agency. In case of non-availability of endorsement from Govt. Agency, the experience uploaded on INFRACON Portal will be taken into consideration. However, the key personnel/ bidder will be solely responsible for any fake information/ CV, which may result in debarment.

C2.2 Senior Bridge Engineer

S. No.	Description		Max. Marks	Reference/Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
1	General Qualification		25		
i)	Graduate in Civil Engineering	21			
ii)	Post-Graduation in Structural Engineering	04			
2	Adequacy for the Project		70		
i)	Total Professional Experience in handling Highway/Bridge projects < 10 years -0 10 years -11 marks Add one mark extra for each additional 2 year subject to maximum 4(four) marks		15		
ii)	Experience in similar capacity in Design/Construction/Construction Supervision of Bridges/ROB/Flyover/Interchanges/any other such structures (similar configuration (2/4/6 laning**) and above) < 5 years -0; 5 years -15 marks Add 1 (one) mark extra for each additional completed year of experience subject to maximum 5 (five) marks		20		
iii)	Experience in similar capacity in supervision of Major Highway Bridges/ROB/Flyover/ Interchanges/ any other structures < 2 Bridges -0 02 Bridge -15 marks Add 2.5 mark extra for each additional bridge subject to maximum 5 marks		20		
iv)	Experience in similar capacity in supervision of Rehabilitation and repair of Major		10		

S. No.	Description	Max. Marks	Reference/Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
	Bridges/ROB/Flyover/ Interchanges/ any other structures < 2 nos. – 0 2 nos. -8 marks > 3 nos.- 10			
v)	Experience in similar capacity of modern bridge construction technology viz., Precast Segmental, Balanced Cantilever Construction, Extra dosed Bridge, Full Span Launching, Incremental Launching. Experience in 1 project – 4 marks More than one project – 5 marks	5		
3	Employment with the Firm < 1 year -0 1 year -3 marks Add 0.5 marks for each subsequent year subject to maximum 2 marks	5		
	Total :	100		

Note:

(1) Similar Capacity includes the following positions

i) On behalf of Consultant/Contractor: Bridge Engineer/Project Manager (Bridges)

ii) On behalf of Government: Executive Engineer

(2) Only those projects (in numbers) will be considered for evaluation above, where the input of the personnel is not < 12 months

(3) In case of experience on behalf of Authority's Engineer or Contractor, the experience shall be duly endorsed by the respective Government agency. In case of non-availability of endorsement from Govt. Agency, the experience uploaded on INFRACON Portal will be taken into consideration. However, the key personnel/ bidder will be solely responsible for any fake information/ CV, which may result in debarment.

C2.3 Highway cum Pavement Engineer

S. No.	Description		Max. Marks	Reference/Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
1	General Qualification		25		
I)	Graduate in Civil Engineering	21			
II)	Post-Graduation in Transportation/Highway Engineering/Pavement engineering or equivalent	04			
2	Adequacy for the Project		70		
	Professional Experience				
i)	Total Professional Experience of Pavement Design/Construction and Maintenance of Highways/Roads/Air Field Runway < 10 years -0 10 years -15 marks Add one mark extra for each additional year of experience subject to maximum 5 (five) marks.		20		
ii)	Experience in Similar capacity in Construction/Construction Supervision of 2/4/6-laning** of major Highway Projects (similar configuration (2/4/6 laning**) and above) < 5 years -0; 5 years -15 marks Add one mark extra for each additional year of experience subject to maximum 5 (five) marks.		20		
iii)	Experience in similar capacity as Pavement specialist/pavement engineer in construction/ construction supervision of Major Highway projects (of length 40% of project length or more of similar configuration (2/4/6 laning**) and above) < 2 nos. -0		25		

S. No.	Description	Max. Marks	Reference/Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
	2 nos. -20 marks Add 2.5 marks extra for each additional project subject to maximum 5 marks.			
iv)	Experience in similar capacity on EPC Projects (of length 40% of project length or more of similar configuration (2/4/6 laning**) and above) 1 Project- 4 marks Add 1 (one) mark extra for each additional project subject to maximum 1 (one) mark	5		
3	Employment with the Firm < 1 year -0 1 year – 3 marks Add 0.5 marks for each subsequent year subject to maximum 2 marks	5		
	Total :	100		

Note:

(1) Similar Capacity includes the following positions

i) On behalf of Consultant/Contractor: Pavement Specialist/ Pavement Engineer/ Pavement Expert / Highway Engineer

ii) On behalf of Government: Executive Engineer

(2) Only those projects (in numbers) will be considered for evaluation above, where the input of the personnel is not < 6 months

(3) In case of experience on behalf of Authority's Engineer or Contractor, the experience shall be duly endorsed by the respective Government agency. In case of non-availability of endorsement from Govt. Agency, the experience uploaded on INFRACON Portal will be taken into consideration. However, the key personnel/ bidder will be solely responsible for any fake information/ CV, which may result in debarment.

C2.4 Senior Quality/Material Expert

S. No.	Description		Max. Marks	Reference/Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
1	General Qualification		25		
	I) Graduate in Civil Engineering	21			
	II) Post Graduation in Geotechnical Engineering/ Foundation Engineering/ Soil Mechanics/ Rock Mechanics	04			
2	Adequacy for the Project		70		
	Professional Experience				
i)	Total Professional Experience in handling Highway/Bridge projects < 10 years -0 10 years -11 Add one mark extra for each additional year of experience subject to maximum 4 (four) marks.		15		
ii)	Experience in similar capacity in Construction/Construction Supervision of major Highway Projects ((similar configuration (2/4/6 laning**) and above)) < 5 years -0; 5 years -19 Add 2.0 (two) marks extra for each additional year of experience subject to maximum 6 (Six) marks.		25		
iii)	Experience in similar capacity in handling Similar Highway projects (of length 40% of project length or more of similar configuration (2/4/6 laning**) and above) < 2 nos. -0 2 nos. - 25 Add 2.5 marks extra for each additional		30		

S. No.	Description	Max. Marks	Reference/Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
	project subject to maximum 5 (five) marks.			
3	Employment with the Firm < 1 year – 0 1 year – 3 Add 0.5 marks for each subsequent year subject to maximum 2 marks	5		
	Total :	100		

Note:

(1) Similar Capacity includes the following positions

i) On behalf of Consultant/Contractor: Quality Expert/ Material Engineer/Material Expert/ Quality Engineer/ Geo-Technical Expert.

ii) On behalf of Government: Executive Engineer

(2) Only those projects (in numbers) will be considered for evaluation above, where the input of the personnel is not < 12 months

(3) In case of experience on behalf of Authority's Engineer or Contractor, the experience shall be duly endorsed by the respective Government agency. In case of non-availability of endorsement from Govt. Agency, the experience uploaded on Infracon Portal will be taken into consideration. However, the key personnel/ bidder will be solely responsible for any fake information/ CV, which may result in debarment.

C2.5 Road/Traffic Safety Expert

S. No.	Description		Max. Marks	Reference/ Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
1	General Qualification		25		
I)	Graduate in Civil Engineering	21			
II)	Post-Graduation in Traffic/ Transportation/ Safety Engineering or equivalent	04			
2	Adequacy for the Project		70		
	Professional Experience				
i)	Total Professional Experience in handling Highway/Bridge projects < 10 years -0 10 years -11 marks Add one mark extra for each additional year of experience subject to maximum 4 (four) marks.		15		
ii)	Experience in similar capacity in Road Safety works on Major Highway Project (similar configuration (2/4/6 laning**) and above). < 5 years -0 5 years -11 marks Add one mark extra for each additional year of experience subject to maximum 4 (four) marks.		15		
iii)	Experience in similar capacity in Road Safety Audits of 2/4/6-laning** Highway projects at different stages including at least one at design stage < 2 nos. -0 2 nos. -15 marks Add 2.5 marks extra for each additional project subject to maximum 5 marks.		20		

S. No.	Description	Max. Marks	Reference/ Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
iv)	Experience in similar capacity in identification and improvement of black spots on Major Highway Project (similar configuration (2/4/6 laning**) and above) < 2 nos. -0 2 nos. -8 marks Add 2 marks extra for each additional improvement of black spots subject to maximum 2 marks.	10		
v)	Experience in similar capacity of preparing Road Safety Management Plans for Inter Urban Highway 1 project -4 marks 2 or more -5 marks	5		
vi)	Experience in similar capacity in field of Road Safety Management Plan 1 project -4 marks 2 or more -5 marks	5		
3	Employment with the Firm <1 year- 0 1 year – 3 marks Add 0.5 marks for each subsequent year subject to maximum 2 marks	5		
	Total :	100		

Note:

(1) Similar Capacity includes the following positions

i) On behalf of Consultant/Contractor: Road Safety Expert

ii) In Government Organizations: Executive Engineer (or equivalent) and above

(2) Only those projects (in numbers) will be considered for evaluation above, where the input of the personnel is not < 6 months

C2.6 Team Leader cum Senior Bridge Engineer:

S. No.	Description		Max. Marks	Reference/Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
1	General Qualification		25		
i)	Graduate in Civil Engineering	21			
ii)	Post Graduation in /Structural Engineering or equivalent specialised stream of civil engineering	04			
2	Adequacy for the Project		70		
a)	Professional Experience in Bridge Projects:				
i)	Total Professional Experience in handling Bridge projects < 12 years -0 12 years -12 marks Add 1 mark extra for each additional year of experience subject to maximum 3 (three) marks.		15		
ii)	Experience as Team Leader or similar capacity in Highway Development projects of (similar configuration (2/4/6 laning**) and above) < 5 years -0 5 years -8 marks Add 1 marks extra for each additional year of experience subject to maximum 2 (two) marks.		10		
iii)	Experience as Team Leader or similar capacity in Highway Development projects (of length 40% of project length or more of similar configuration (2/4/6 laning**) and above) 1 project -4 marks add 1 mark extra for additional projects subject to		5		

S. No.	Description	Max. Marks	Reference/Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
	maximum1 (one) mark			
b)	Experience as Team Leader or similar capacity of at least Two projects in Construction Supervision / AE/ IE/ Project preparation involving at least one Major Bridge (minimum 300 m length without approaches) in the Project (of length 40% of project length or more of similar configuration (2/4/6 laning**) < 2 projects -0 2 Projects -20 marks Add 5 marks for each additional project subject to maximum 10 marks.	30		
c)	Experience as Team Leader/Project Manager or similar capacity in Operation and Maintenance of Major Bridge (minimum 300 m length without approaches) in the Project (of length 40% of project length or more of similar configuration (2/4/6 laning**) 1 project – 8 marks Add 1 mark extra for each additional project subject to maximum 2 (two) mark	10		
3	Employment with the Firm < 1 year -0 1 year – 3 marks Add 0.5 marks for each subsequent year subject to maximum 2 marks	5		
	Total :	100		

C2.7 Resident cum Pavement Specialist

S. No.	Description		Max. Marks	Reference/Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
1	General Qualification		25		
i)	Graduate in Civil Engineering	21			
ii)	Post Graduation in Transportation/Highway Engineering/Structural Engineering/Geotechnical Engineering	04			
2	Adequacy for the Project		70		
	Professional Experience				
i)	Total Professional Experience in handling Highway projects < 12 years -0 12 years -16 marks Add 2 mark extra for each additional year of experience subject to maximum 4 (four) marks.		20		
ii)	Experience as Resident Engineer/Project Director/Project Manager/Superintending Engineer or equivalent/Executive Engineer or equivalent on construction works/Authority Engineer/Independent Engineer Projects (similar configuration (2/4/6 laning*) and above). < 5 years -0; 5 years -15 marks Add 1 marks extra for each additional year of experience subject to maximum 5 (five) marks.		20		
iii)	Experience in similar capacity in handling major 2/4/6-laning** projects (of length 40% of project length or more of similar configuration (2/4/6 laning**) and above)		25		

S. No.	Description	Max. Marks	Reference/Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
	< 2 nos. -0 2 nos. -19 marks Add three marks extra for each additional project subject to maximum 6 (Six) marks.			
iv)	Experience in similar capacity of Highway Project of Construction/Construction Supervision on EPC Mode (of length 40% of project length or more of similar configuration (2/4/6 laning**) and above) 1 Project- 4 marks Add 1 (one) mark extra for each additional project subject to maximum 1 (one) mark	5		
3	Employment with the Firm < 1 year -0 1 year – 3 marks Add 0.5 marks for each subsequent year subject to maximum 2 marks	5		
	Total :	100		

C2.8 Senior Contract Specialist

S. No.	Description		Max. Marks	Reference/ Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
1	General Qualification		25		
I)	Graduate in Civil Engineering	21			
II)	Post Graduate Degree in Law/PG in management/certificate course in management/ certificate course in construction management/certificate course in contract management	04			
2	Adequacy for the Project		70		
	Professional Experience				
i)	Total Professional Experience of Contract Management. < 15 years -0 15 years -15 marks Add one mark extra for each additional year of experience subject to maximum 5 (five) marks.		20		
ii)	Experience as Contract Specialist on any National/State Highway project. < 4 years -0 4 years -15 marks Add one mark extra for each additional year of experience subject to maximum 5 (five) marks.		20		
iii)	Contract Management of a large Highway contract say over Rs.150 crore including experience of handling variation orders, claims of the contractor and there appropriate disposal < 2 nos. -0 2 nos. -20 Add 2.5 marks extra for each additional project		25		

	subject to maximum 5 (five) marks.			
v)	Experience of Handling Arbitration cases in respect of any Highway project. 1 project -4 marks 2 or more projects-5 marks	5		
3	Employment with the Firm <1 year- 0 1 year – 3 marks Add 0.5 marks for each subsequent year subject to maximum 2 marks	5		
	Total :	100		

C2.9 Team Leader cum Senior Tunnel Expert:

S. No.	Description		Max. Marks	Reference/ Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
1	General Qualification		25		
I)	Graduate in Civil/Mining Engineering or equivalent	21			
II)	Post-Graduate or chartered engineer in Mining Engineering/ Geotechnical Engineering /Structural Engineering/Rock Mechanics or equivalent	04			
2	Adequacy for the Project		70		
	Total Professional Experience				
a i)	< 20 years -0 20years -5 marks Add one mark extra for each additional year of experience subject to maximum 2 (Two) marks.		7		
a ii)	Total professional experience in handling major tunnelling projects <15 years – 0 marks 15 years – 6 marks Add 1 mark extra for each additional year of experience subject to maximum 2 (two) marks.		8		
a iii)	Experience in major tunnel construction/construction supervision projects (Road/Rail/Metro) <10 years – 0 marks 10 years – 7 marks Add 1.5 marks extra for each additional year of experience subject to maximum 3 marks.		10		
b	Experience in Similar Capacity				
b i)	Experience as Team Leader or similar capacity in construction supervision of major tunnel projects (Road/Rail/Metro) of length equal to or more than 4 Km <5 years – 0 marks 5 years – 7 marks Add 1.5 marks extra for each additional year of experience subject to maximum 3 marks		10		
b ii)	Experience as Team Leader or similar capacity of project Preparation/Design of tunnel projects(Road/Rail/Metro) of length 4 Km or more 1 Project – 8 marks Add 1 mark extra for each additional projects subject to maximum 2 marks.		10		
b iii)	Experience as Team Leader or similar capacity in construction supervision of tunnels (Road/Rail/Metro) of length 4 km or more		20		

S. No.	Description	Max. Marks	Reference/ Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
	<2 project -0 marks 2 Projects – 15 marks Add 1.25 mark extra for each additional projects subject to maximum 5(five) marks.			
C)	Experience in project preparation/ design of major tunnel projects apart from those under 2 (b) (ii) (Road/Rail/Metro) 1 project -4 marks 2 or more -5 marks	5		
3	Employment with the Firm <1 year- 0 1 year – 3 marks Add 0.5 marks for each subsequent year subject to maximum 2 marks	5		
	Total :	100		

Note: As per RFP, Definition of Team Leader includes Project Manager/Resident Engineer/ or any equivalent position.

** tunnel projects, unless specifically mentioned, to be considered for evaluation has to be major tunnels of length equal to or more than 1.5 Km

C2.10 Resident cum Tunnel Excavation Expert:

S. No.	Description		Max. Marks	Reference/ Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
1	General Qualification		25		
I)	Graduate in Civil/Mining Engineering or equivalent	21			
II)	Post-Graduate or chartered engineer in civil/Mining Engineering or equivalent	04			
2	Adequacy for the Project		70		
	Total Experience				
a i)	<15 years – 0 15 years – 12 marks Add 1 mark extra for each additional year of experience subject to maximum 3 (three) marks.		15		
A ii)	Total professional experience in handling major tunnelling projects < 10 years – 0 10 years – 7 marks Add 1.5 marks extra for each additional year of experience subject to maximum 3 (three) marks.		10		
b	Experience in Similar Capacity				
b i)	Experience as Tunnel Excavation Expert or similar capacity in construction supervision of major tunnelling projects (Road/Rail/Metro) < 7 years – 0 7 years – 7 marks Add 1.5 marks extra for each additional year of experience subject to maximum 3 (three) marks.		10		
b ii)	Experience as Tunnel Excavation Expert or similar capacity in construction supervision of tunnel projects (Road/Rail/Metro) of minimum length of 4 km (Minimum one year supervision in a project)		20		

S. No.	Description	Max. Marks	Reference/ Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
	< 2 projects – 0 2 projects – 15 marks Add 2.5 marks extra for each additional projects subject to 5 (five) marks.			
b iii)	Experience in tunnel design/ DPR/ preparation / feasibility study/design review involving major tunnel projects (Road/Rail/Metro) of minimum length of 4 km (minimum 1 year experience in a project) 1 project – 7 marks Add 1 mark extra for each additional projects subject to maximum 3 (three) marks	10		
C)	Experience in construction of major tunnel projects (Road/Rail/Metro) apart from those under 2 (b) (ii) 1 project – 3 marks Add 1 mark extra for each additional projects subject to maximum 2 (two) marks.	5		
3	Employment with the Firm <1 year- 0 1 year – 3 marks Add 0.5 marks for each subsequent year subject to maximum 2 marks	5		
	Total :	100		

Note:- Max Age = 65 Years

** tunnel projects, unless specifically mentioned, has to be major tunnels of length equal to or more than 1.5 Km to be considered for evaluation

C2.11 TUNNEL DESIGN ENGINEER:

S. No.	Description		Max. Marks	Reference/ Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
1	General Qualification		25		
I)	Graduate in Civil Engineering or equivalent	21			
II)	Post-Graduate in Engineering (Structural)	04			
2	Adequacy for the Project		70		
	Total Professional Experience				
a i)	<20 years – 0 20 years – 11 marks Add 1 mark extra for each additional year of experience subject to maximum 4 (four) marks.		15		
A ii)	Total Professional Experience in handling major Tunnel projects <12 years – 0 12 years- 7 marks Add 1 mark extra for each additional year of experience subject to maximum 3 (three) marks.		10		
b	Experience in Similar Capacity				
b i)	Experience in tunnel design (Road/Rail/Metro) works in similar capacity <12 years – 0 12 years – 7 marks Add 1 mark extra for each additional year of experience subject to maximum 3 (three) marks.		10		
b ii)	Experience in similar capacity in Project Preparation/DPR involving design of tunnels (Road/Rail/Metro)of more than 4 km length (Min. 1 year experience in a project) < 3 projects – 0 3 projects – 11 marks Add 1 mark extra for each additional projects subject to maximum 4 (four) marks.		15		
b iii)	Experience in similar capacity in construction/construction supervision projects involving design/design review of tunnels of more than 4 Km length (Min. 1 year experience in project) <2 projects – 0 2 projects – 7 marks Add 1.5 mark extra for each additional projects subject to maximum 3(three) marks.		10		
c i)	Experience in innovation tunnel design (Road/Rail/Metro) like immersed tunnel and sub-sea bored tunnel 1 projects – 4 marks 2 or more projects -5 marks		5		
c ii)	Experience in design tunnel projects(Road/Rail/Metro) apart from those under 2 (b) (ii)		5		

S. No.	Description	Max. Marks	Reference/ Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
	1 project – 4 marks 2 or more projects – 5 marks			
3	Employment with the Firm <1 year- 0 1 year – 3 marks Add 0.5 marks for each subsequent year subject to maximum 2 marks	5		
	Total :	100		

Note: Max Age =65Years

** tunnel projects, unless specifically mentioned, has to be major tunnels of length equal to or more than 1.5 Km to be considered for evaluation

C2.12 TUNNEL SAFETY EXPERT

S. No.	Description		Max. Marks	Reference/ Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
1	General Qualification		25		
I)	Graduate in Civil/Mining Engineering or equivalent	21			
II)	Any professional Certification from a recognized/statutory body on safety/health/shot firer	04			
2	Adequacy for the Project		70		
	Total Professional Experience				
a i)	<20 years – 0 20 years – 11 marks Add 1 mark extra for each additional year of experience subject to maximum 4 (four) marks.		15		
A ii)	Experience Tunnel (Road/Rail/Metro) Safety Works <10 years – 0 10 years – 11 marks Add 1 mark extra for each additional year of experience subject to maximum 4 (four) marks.		15		
a iii)	International exposure in tunnel safety works in developed countries <7 years – 0 7 years – 7 marks Add 1 mark extra for each additional projects subject to maximum 3 (three) marks.		10		
b	Experience in Similar Capacity				
b i)	Experience in similar capacity of Tunnel Safety Audits during construction stage of tunnel projects(Road/Rail/Metro) of minimum length of 4 Km < 2 projects – 0 2 projects – 15 marks Add 1.25 mark extra for each additional projects subject to maximum 5 (five) marks.		20		
b ii)	Experience in similar capacity of Tunnel Safety Audits in design stage on tunnel projects (Road/Rail/Metro) 1 project – 8 marks 2 or more – 10 marks		10		
C)	Experience in construction of major tunnel projects (Road/Rail/Metro) using 1 project – 3 marks Add 1 mark extra for each additional projects subject to maximum 2 (two) marks.		5		
3	Employment with the Firm <1 year- 0 1 year – 3 marks		5		

S. No.	Description	Max. Marks	Reference/ Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
	Add 0.5 marks for each subsequent year subject to maximum 2 marks			
	Total :	100		

Note: Max Age = 65 Years

** tunnel projects, unless specifically mentioned, has to be major tunnels of length equal to or more than 1.5 Km to be considered for evaluation

C2.13 Senior Geotechnical Expert:

S. No.	Description			Max. Marks	Reference/ Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
1	General Qualification			25		
I)	Graduate in Civil Engineering / Masters in Engineering Geology or equivalent from a recognized university	21				
II)	Post Graduate in Rock Mechanics /Foundation Engineering/ Tunnel Engineering	04				
2	Adequacy for the Project			70		
	Total Professional Experience					
a i)	<20 years – 0 20 years – 11 marks Add 1 mark extra for each additional year of experience subject to maximum 4 (four) marks.			15		
A ii)	Experience in Construction/ Construction Supervision of major tunnel projects(Road/Rail/Metro < 10 years – 0 10 years – 7 marks Add 1 mark extra for each additional year of experience subject to maximum 3 (three) marks.			10		
b	Experience in Similar Capacity					
b i)	Experience as Geotechnical engineer or similar capacity in construction/ construction supervision of at least 4 tunnel projects(Road/Rail/Metro) of length equal to or more than 4 km < 4 projects – 0 4 projects -17 marks Add 2 mark extra for each additional project subject to maximum 8 (eight) marks			25		
b ii)	Experience as Geotechnical engineer or similar capacity in Construction/ Construction Supervision of major tunnel projects involving vertical shaft sinking of at least 200m vertical depth 1 project – 4 marks 2 or more projects – 5 marks			5		
B iii)	Experience as Geotechnical engineer or similar capacity in design/project preparation of tunnel projects(Road/Rail/Metro) of at least 4 km			15		

S. No.	Description		Max. Marks	Reference/ Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
	length < 2 projects – 0 2 projects – 11 marks Add 2 marks extra for each additional projects subject to maximum 4 (four) marks.				
3	Employment with the Firm <1 year- 0 1 year – 3 marks Add 0.5 marks for each subsequent year subject to maximum 2 marks		5		
	Total :		100		

Note:- Max Age =65 Years

** tunnel projects, unless specifically mentioned, has to be major tunnels of length equal to or more than 1.5 Km to be considered for evaluation.

C2.14 Senior GEOLOGIST:

S. No.	Description		Max. Marks	Reference/ Details of projects Claimed for self-assessment	Marks self-assessed by the bidder
1	General Qualification		25		
I)	Masters in Geology /Applied Geology from recognized university.	25			
2	Adequacy for the Project		70		
	Total Professional Experience				
a i)	<<20 years – 0 20 years – 15 marks Add 1 mark extra for each additional year of experience subject to maximum 5 (five) marks.		20		
A ii)	Experience in major Tunnel construction/construction supervision Projects (Road/Rail/Metro) using NATM technology < 5 years – 0 5 years – 12 marks Add 1.5 marks extra for each additional year subject to maximum 3 (three) marks.		15		
b	Experience in Similar Capacity				
b i)	Experience in major Tunnel(Road/Rail/Metro) Construction works in similar capacity < 7 years – 0 7 years – 12 marks Add 1 mark extra for each additional year of experience subject to maximum 3 (three) marks.		15		
b ii)	Experience in similar capacity in project preparation/DPR involving of major tunnel projects (Road/Rail/Metro). (Min 1 year experience in a project) <2 projects – 0 2 projects -7 marks Add 1.5 marks extra for each additional projects subject to maximum 3 (three) marks.		10		
b iii)	Experience in similar capacity in highway tunnel construction/construction supervision with minimum length of 4 Km < 2 projects – 0 2 project – 7 marks Add 1.5 marks extra for each additional projects subject to maximum 3 (three) marks.		10		
3	Employment with the Firm <1 year- 0 1 year – 3 marks Add 0.5 marks for each subsequent year subject to maximum 2 marks		5		
	Total :		100		

Note: Max Age = 65 Years

** tunnel projects, unless specifically mentioned, has to be major tunnels of length equal to or more than 1.5 Km to be considered for evaluation

Note: applicable to all key personnel:

If a key personnel has worked in next lower category to the similar capacity, the marks allotted to key personnel in the category 'experience in similar capacity' shall be reduced To two thirds of marks in this category. This shall be applicable for evaluation of all key personnel.

2. ** Similar projects means 2/4/6 lane as applicable for the project for which RFP is invited. For 2-lane projects experience of 4/6 lane also to be considered with a multiplication factor of 1.5. Experience of 4/6 lane shall be considered interchangeably for 4/6 laning projects. For 4/6 laning projects, experience of 2 lane will be considered with a multiplication factor of 0.4.

*****

[Ministry of Road Transport & Highways]

Government of India

Project Management Consultancy Services for <Project Description>

PART-II

TERMS OF REFERENCE

&

DRAFT CONCESSION AGGREMENT

<October 2020>

<Address of Agency>

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APPENDIX-VI

TERMS OF REFERENCE (TOR)

(Agency may suitably modify the ToR in respect of Standalone Bridge & Tunnel Projects)

Consultancy Services for <Project Description>

Terms of Reference (TOR) for PMC

1. **General**

1.1 The <Agency> has been entrusted with the assignment of <Project Description>. <Agency> now invites proposal from Technical consultants for PMC as per details given in **Annexure-I.**

1.2 <Agency>will be the employer and executing agency for the consultancy services and the standards of output required from the appointed consultants are of international level both in terms of quality and adherence to the agreed time schedule. The consultancy firm will solely be responsible for submission of quality work in stipulated period.

1.3 Ministry has recently awarded works of consultancy services for construction of ROBs for replacing level crossings in various states. In case a level crossing exists in a project reach, consultant is required to co-ordinate with those consultants and finalize the alignment & configuration of road accordingly. However, if the same is not covered in the above assignment of DPR/feasibility study awarded by Ministry, the consultant under this assignment shall be responsible for preparing DPR for such level crossings along with pre-construction activities and construction supervision of the entire project.

2. **Objective**

2.1 The main objective of the consultancy service is to establish the technical, economical, and financial viability of the project and prepare feasibility report, detailed project report, carrying out pre-construction activity and also construction supervision to ensure quality work for rehabilitation and upgradation of the existing road to <lane> configuration.

2.2 The viability of the project shall be established taking into account the requirements with regard to rehabilitation, upgrading and improvement based on highway design, pavement design, provision of service roads wherever necessary, type of intersections, rehabilitation and widening of existing and/or construction of new bridges and structures, road safety features, quantities of various items of works and cost estimates and economic analysis within the given time frame.

2.3 The Detailed Project Report (DPR) would inter-alia include detailed highway design, design of pavement and overlay with options for flexible or rigid pavements, design of bridges and cross drainage structures and grade separated structures, design of service roads, quantities of various items, detailed working drawings, detailed cost estimates, economic and financial viability analyses, environmental and social feasibility, social and environmental action plans as appropriate and documents required for tendering the project on commercial basis for international / local competitive bidding.

2.4 The PMC consultant should ensure detailed project preparation incorporating aspects of value engineering, quality audit and safety audit requirement in design and implementation. The Consultant shall ensure to carry out Road Safety Audit at various stages as per supplement-III (Additional Requirement for Safety Audit) of TOR.

2.5 The consultant should, along with Feasibility Report, clearly bring out through financial analysis the preferred mode of implementation on which the Civil Works for the stretches are to be taken up. The consultant should also give cost estimates along with feasibility report/ detailed Project Report.

2.6 If at inception stage or feasibility stage, employer desires to terminate the contract, the contract willbe terminated after payment up to that stage. Likewise the contract may also be terminated/foreclose at any stage/phase and payment due upto that stage only would be payable.

3. **Scope of Services**

The PMC consultancy shall be carried out into following phases:

Phase	Description	Sub-Phase	Key activities	Report/deliverable submitted
1	Project preparation	1A (Feasibility Study)	Project planning and mobilization	Inception Report and QAP
			Alignment finalization, preliminary surveys	Alignment Options Report and Feasibility Report
		1B (DPR)	LA, utilities identification; creation of draft notifications and proposals	Strip Plan, LA Report (3a, 3A), Clearances and Utility Shifting proposals
			Detailed design of highway, preparation of detailed project report with drawings	Draft DPR Report, Final DPR Report, documents and drawings
			Preparation of bid documents and technical schedules	Civil Works Contract Agreement and Schedules
2	Pre-construction activities		*Land acquisition process, obtaining final utilities estimates and required clearances*	JMS and *3D Report, Final Project Clearances and Utilities Report*
			Land acquisition award determination	*3G Report*
			Obtaining possession of land	*Land Possession Report*
			Court cases, arbitration including mutation	*Court cases, arbitration including mutation*
3	*Construction activity and maintenance*		**A. During Construction** 1. Review and approval of design 2.Supervision of construction work , 3. review of progress work 4. Quality assurance monitoring and	

Phase	Description	Sub-Phase	Key activities	Report/deliverable submitted
			supervision test, 5.Arrangement of safety of work/workers/users/ pedestrians 6. Progress of pre-construction activities 7. Clearances from different agencies **B. During maintenance** 1) Performance Monitoring through Network Survey Vehicle 2) Inspection of defect and deficiencies 3) Maintenance of the road work 4) Quality assurance during project life 5) Safety aspects	

Detailed TOR for Project Preparation and Pre Construction activity shall be as per Appendix VI A and for construction Supervision as per Appendix VI B. Wherever the consultant is stated in the TOR or elsewhere

(i) as DPR, it shall mean the Project Management consultant in the Phase 1 and Phase 2 (Project Preparation and Pre Construction activity) and

(ii) as Authority Engineer,it shall mean the Project Management consultant in Phase 3 (Construction Supervision and maintenance)

APPENDIX VI A

Terms of Reference (TOR) for Project Preparation and Pre Construction Activity

1. General

1.1 The <Agency> has been entrusted with the assignment of <Project Description>. <Agency> now invites proposal from Technical consultants for carrying out detailed project report as per details given in **Annexure- I.**

1.2 <Agency> will be the employer and executing agency for the consultancy services and the standards of output required from the appointed consultants are of international level both in terms of quality and adherence to the agreed time schedule. The consultancy firm will solely be responsible for submission of quality work in stipulated period.

1.3 Ministry has recently awarded works of consultancy services for construction of ROBs for replacing level crossings in various states. In case a level crossing exists in a project reach, consultant is required to co-ordinate with those consultants and finalize the alignment & configuration of road accordingly. However, if the same is not covered in the above assignment of DPR/feasibility study awarded by Ministry, the consultant under this assignment shall be responsible for preparing DPR for such level crossings.

2. Objective

2.1 The main objective of the consultancy service is to establish the technical, economical, and financial viability of the project and prepare detailed project reports for rehabilitation and upgrading of the existing road to <lane> configuration.

2.2 The viability of the project shall be established taking into account the requirements with regard to rehabilitation, upgrading and improvement based on highway design, pavement design, provision of service roads wherever necessary, type of intersections, rehabilitation and widening of existing and/or construction of new bridges and structures, road safety features, quantities of various items of works and cost estimates and economic analysis within the given time frame.

2.3 The Detailed Project Report (DPR) would inter-alia include detailed highway design, design of pavement and overlay with options for flexible or rigid pavements, design of bridges and cross drainage structures and grade separated structures, design of service roads, quantities of various items, detailed working drawings, detailed cost estimates, economic and financial viability analyses, environmental and social feasibility, social and environmental action plans as appropriate and documents required for tendering the project on commercial basis for international / local competitive bidding.

2.4 The DPR consultant should ensure detailed project preparation incorporating aspects of value engineering, quality audit and safety audit requirement in design and implementation. The Consultant shall ensure to carry out Road Safety Audit at various stages as per supplement-III (Additional Requirement for Safety Audit) of TOR.

2.5 The consultant should, along with Feasibility Report, clearly bring out through financial analysis the preferred mode of implementation on which the Civil Works for the stretches are to be taken up. The consultant should also give cost estimates along with feasibility report/ detailed Project Report.

2.6 If at inception stage or feasibility stage, employer desires to terminate the contract, the contract will be terminated after payment up to that stage.

3. Scope of Services

The general scope of services is given in the sections that follow. However, the entire scope of services would, inter-alia, include the items mentioned in the Letter of Invitation, terms of reference, general contract and any supplements and appendices to these documents

3.1 RoW and Land related aspects

3.1.1 The Right of Way norms for National Highways should be as under:

(i)	Expressways	90 m
(ii)	Economic Corridors and major National Highways requiring provisions for Service Roads and planned for expansion to 8-lanes	70 m
(iii)	National Highways with planed capacity to 6-lane Configuration	60 m
(iv)	National Highways with planned capacity to 4-lane	45 m
(v)	NH with planned capacity to two-lane + PS configuration requiring provision of Service Roads	30 m

3.1.2 In case of upgradation of an existing two lane Highway to a 4/6/8 lane configuration, a comparative cost-benefit analysis shall necessarily be carried out while recommending development of existing route/alignment vis-a-vis alternate option of a green – field alignment. While carrying out the cost benefit analysis of both the options, the following factors shall be considered:

(i) Extant of land acquisition and the associated costs;

(ii) Number of structures required to be acquired along their extant and costs.

(iii) The quantum of utilities and costs required for their shifting.

(iv) The extent of tree –felling and the associated cost & time for obtaining the requisite permissions.

3.1.3 However, green-field option may not be resorted to in cases where growth of traffic is such that ultimate capacity does not require widening beyond 4 lanes in future.

3.1.4 In case the green field alignment option works out to be a preferred option, then-

(i) Entire ROW (60m -70m) may be acquired for a maximum capacity of 8 lane main carriage way with provision for service roads.

(ii) Initially 4 lane carriage-way with 4 lane structures shall be developed with additional land left in the median for future expansion.

(iii) The highway shall have provision for service roads in inhabited areas, preferably of 10 mtrs width, with maximum access –control for the main carriage way.

(iv) Access to the towns/cities/establishments located on the existing National Highway, may be provided through spurs from the green field route.

3.1.5 All efforts shall be made to avoid any road alignment through National Parks and Wildlife Sanctuaries, even if it requires taking a longer route / bypass. However, where it becomes absolutely unavoidable and necessary to keep the alignment through such reserve forest / restricted areas, land would be acquired with RoW of not more than 30 mtrs.

3.1.6 Similarly, though it may be difficult, while determining the alignment for any bypass, efforts be made to see if these could be along the revenue boundaries of two revenue estates thereby minimizing the compulsions of land owners / farmers for cross-overs to the other side. In case such an alignment is not found feasible, it should be ensured that

access to common facilities for the local people (e.g. schools, Healthcare facilities etc.) is maintained only on one side of the alignment, thereby minimizing the need for cross-over for day-to-day life.

3.1.7 Protection of the acquired RoW against any possible encroachments is extremely important. Boundary stones be provided at the end of the RoW as per provisions of IRC:SP:84 and also supplemented as per Circular dated 08.12.2015 issued by <Agency>. The boundary pillars alone, which are subject to removal with passage of time, may not be enough to save against encroachments. As such, the typical cross-section of a Highway Road is being re-visited separately with the intention of providing permanent features in this behalf. For a typical RoW of 60 mtrs, starting from one end, these will require the following:

(a) Use barricading of the RoW with plantation of hedge-like species (Ficus / Poplars) within a 3m wide strip area, dug up to 0.6 to 0.9 mtrs, of which 2.0 mtrs to serve as a Utility Corridor.

(b) Provision of a Service Road (along the inhabited area) with its drainage slope towards the drain / area reserved for Strip Plantation, for a width of 9.0 mtrs.

(c) Earmark width of 1.5 mtrs for construction of a drain so as to be able to capture the rainwater flow from the Service Road (wherever provided) and the main carriageway.

(d) Three lane with paved shoulders: Main carriageway – 10.5 mtrs, paved shoulder – 2.5 mtr and earthen shoulder – 1.5 mtr.

(e) Median – 5.0 mtrs (effective width 4.5 m), and

(f) A Mirror Image on the other end.

3.1.8 With regard to land acquisition, tree felling, utility shifting across the alignment, Ministry's Guidelines issued vide letter no. NH -15017/21/2018-P&M dated 10th May, 2018, or any amendment thereof, may be adhered to.

3.2 Provisions of short bypasses, service roads, alignment corrections, improvement of intersections shall be made wherever considered necessary, practicable and cost effective. However, bypasses proposals should also be considered, wherever in urban areas, improvement to <lane> of the existing road is not possible.

3.3 Role and Responsibilities at different stages of Land Acquisition

The Consultant in the process of his deliverables, is expected to:

(i) To delineate and propose the most optimal alignment and take care of geometrics of the road to meet safety parameters while finalizing the DPR;

(ii) Identify and avoid (to the extent feasible) all such structures (religious structures, public utilities cremation grounds, private structures) in the RoW of the road project that could become major hindrances at the time of project execution;

(iii) Procure or create digitized, geo referenced cadastral/land revenue maps for the purpose of land acquisition activities. Where state governments of local agencies have already digitize cadastral maps, the consultant shall arrange to procure such maps. The digitized map should exactly match the original map so that the dimensions and area of plots can be extracted from the map itself.

(iv) Co-ordinate collection of all relevant land revenue records (including Khasra maps,

Khatiyan, Jamabandi etc.) from the local land revenue administration office required for preparation of Draft notification under Section 3A of the NH Act.

(v) Identify and list all land parcels that need to be acquired as part of project road. Conduct Joint measurement survey in conjunction with CALA, the Executing Agency and the Land Revenue Department to verify land records.

(vi) Assist the CALA and the Project Executing agency in preparation of statutory notification under Sections 3A, the CALA during hearing of objections received under Section 3C, recording of hearings and completion of this process, preparation of draft notification under Section 3D and completion of the LA process at every stage, timely publication of notifications and public notices in newspapers at every stage;

(vii) Clear identification and preparation of an inventory of the assets attached to the land under acquisition (e.g. Structures, trees, crops or any such assets which should be valued for payment of compensation);

(viii) Co-ordination with offices of various departments like Land Revenue Office (or Tehsil), Registrar office and other State departments (public works department, horticulture department, forest department etc.) for evaluation of assets (Structures, tree, crops etc.) attached to the land and liaison with respective State authority for authentication of the valuation.

(ix) Prepare an inventory of all the utilities (electrical/water supply lines/gas pipelines etc.- both linear and cross overs) and all such structures (religious structure, public utilities, cremation grounds, private structures) in the RoW of the road project that could become major hindrances at the time of project execution;

(x) Carefully avoid location of any Flyover/VUP/elevated structure where a high tension electricity line (66/132/220/400 KV etc.) is crossing over so as to avoid raising of such line at such point, while designing the road projects;

(xi) Assist in demarcation of the acquired land and installation of the boundary stones/pillars/peg makings along the RoW of the alignment;

(xii) Identification of land parcels missed out from acquisition in the first round and assist the Authority and the CALA in preparation of Draft Notification for acquisition of the land under missing plots.

3.4 Approach to the provision and specifications for Structures:

3.4.1 The structures on roads viz. Bridges, ROBs (Road Over Bridges, and Flyovers), RUBs (Road Under Bridges) etc. are designed for more than 50 years. It is difficult to increase the width of the structures at a later date which may also have larger financial implications apart from construction related issues in running traffic. Therefore, it has been decided to keep provision for all the structures including approaches comprising of retaining structures as 6-lane (length of such approaches shall, in no case, be less than 30m on either side) on all the four-lane highways except in the following cases (i) Reserve Forest (ii) Wild life Areas (iii) Hilly Areas (iv) Urban Areas where site condition do not permit this.Wherever elevated sections are designed through any inhabited areas, these should be six-lane structures supported on single piers so that the road underneath serves as effective service roads on both sides.

3.4.2 Highway projects shall be designed for separation of local traffic especially for Vulnerable Road Users (VRUs), for longitudinal movements and crossing facilities through viaduct(s) located at convenient walking distance. Provision of PUPs and CUPs with size of 7.0m x 4.0m, as specified in para 2.10 of the IRC specifications, has proved to be insufficient

keeping in view the increased use of mechanization in agriculture practices. These structures do not support the easy passage / crossing for the tractors with trolleys so often used for agricultural operations. As traffic on cross roads is increasing day-by-day, it has been decided to substitute the provision of Pedestrian Underpass (PUP) / Cattle Underpass (CUP) [for para 2.10 of IRC specifies the dimensions of 7.0m x 3.0m] with a LVUP with a minimum size of 12 (lateral clearance) x 4m (vertical clearance). Out of 12m lateral width, 2.5m width on one side shall be raised for pedestrian sidewalks with grills to make pedestrian movement convenient and safe. A third smaller dimension VUP-SVUP (4m*7m) for all cross roads carriageway width lesser than 5.5m may also be considered. Thus VUPs would be of three grades i.e.VUP-5.5mx20m; LVUP-4mx12m; and SVUP-4mx7m. These structures shall be located at the most preferred place of pedestrian / cattle / day-to-day crossings. Depending on the site conditions, feasibility of clubbing the crossing facilities through service roads shall also be explored. Further, the bed level of these crossings shall not be depressed as any such depression, in the absence of proper drainage facilities becomes water-logged rendering the same unusable. Ideally, the bed level of the crossings should be a bit higher with proper connectivity to a drain, which could serve the drainage requirements of the main carriageway, the underpass and the service road as well.

3.4.3 Wherever the alignment of 4-lane Highway road project is retained in-situ while passing through inhabited areas (e.g. villages), it should be ensured that Service Roads are provided on both sides of the carriageway, connected underneath with a cross-over structure (VUP/LVUP/SVUP). Thus each habitation should preferably have crossing facility at the highways with a vertical clearance of 4 mtrs.

3.4.4 To ensure that bypass once constructed serves the intended purpose during its life, all the bypasses shall be well designed and access controlled. The entry / exit from / to side roads shall be controlled such that they are grade separated at major roads or at spacing not less than 5 kms. Side roads at closer spacing shall be connected to the service roads on either side and taken to major roads forprovision of grade separated interchange.

3.5 The provision of embankments shall be kept minimum so as to save land as well as earth which are scarce resources. This can be decided on case to case basis with due deliberations. However, economic considerations may also be given due weightage before deciding the issue.

3.6 The Consultant shall study the possible locations and design of toll plaza if applicable to the project. Wayside amenities Land (minimum 5 acres, length and depth preferably in the ratio of 3:2) shall also be acquired for establishment of Way-side amenities at suitable locations at distances varying between 30 to 50 kms on both sides of the Highway. The local and slow traffic may need segregation from the main traffic and provision of service roads and fencing may be considered, wherever necessary to improve efficiency and safety.

3.7 The Consultant will also make suitable proposals for widening/improvement of the existing road and strengthening of the carriageways, as required at the appropriate time to maintain the level of service over the design period. The Consultants shall prepare documents for EPC/PPP contracts for each DPR assignment.

3.8 All ready to implement 'good for construction' drawings shall be prepared/reviewed incorporating all the details.

3.9 Environmental Impact Assessment, Environmental Management Plan and Rehabilitation

and Resettlement Studies shall be carried out by the Consultant meeting the requirements of the lending agencies like ADB/ World Bank/JICA, etc.

3.10 Wherever required, consultant will liaise with concerned authorities and arrange all clarifications. Approval of all drawings including GAD and detail engineering drawings will be got done by the consultant from the Railways. However, if Railways require proof checking of the drawings prepared by the consultants, the same will be got done by <Authority> and payment to the proof consultant shall be made by < Authority > directly. Consultant will also obtain final approval from Ministry of Environment and Forest for all applicable clearances. Consultant will also obtain approval for estimates for shifting of utilities of all types from the concerned authorities and <Agency>. Consultant is also required to prepare all Land Acquisition papers (i.e. all necessary schedule and draft 3a, 3A, and 3D, 3G notification as per L.A. act) for acquisition of land either under NH Act or State Act.

3.11 The DPR consultant shall be required to prepare the Bid Documents, based on the feasibility report, due to exigency of the project for execution if desired by <Agency>.

3.12 Consultant shall obtain all types of necessary clearances required for implementation of the project on the ground from the concerned agencies. The client shall provide the necessary supporting letters and any official fees as per the demand note issued by such concerned agencies from whom the clearances are being sought to enable implementation.

3.13 The consultant shall prepare separate documents for BoT as well as EPC contracts at Feasibility stage / DPR stage. The studies for financing options like BoT, Annuity, EPC will be undertaken in feasibility study stage.

3.14 The consultant shall be guided in its assignment by the Model Concession/ Contract Agreements for PPP/ EPC projects, as applicable and the Manual of Specifications and Standards for two/ four/ six laning of highways published by IRC (IRC:SP:73 or IRC:SP:84 or IRC:SP:87, as applicable) along with relevant IRC codes for design of long bridges.

3.15 The consultant shall prepare the bid documents including required schedules (as mentioned above) as per EPC/ PPP documents. For that it is suggested that consultant should also go through the EPC/PPP documents of ministry before bidding the project. The Consultant shall assist the <Agency> and the Legal Adviser by furnishing clarifications as required for the financial appraisal and legal scrutiny of the Project Highway and Bid Documents.

3.16 Consultant shall be responsible for sharing the findings from the preparation stages during the bid process. During the bid process for a project, the consultant shall support the authority in responding to all technical queries, and shall ensure participation of senior team members of the consultant during all interaction with potential bidders including pre-bid conference, meetings, site visits etc. In addition, the consultant shall also support preparation of detailed responses to the written queries raised by the bidders.

4. General

4.1 Primary Tasks

General Scope of Services shall cover but be not limited to the following major tasks (additional requirements for Preparation of Detailed Project Report for Hill Roads and Major Bridges are given in **Supplement I** and **II** respectively):

i. Review of all available reports and published information about the project road

and the project influence area;

ii. Environmental and social impact assessment, including such as related to cultural properties, natural habitats, involuntary resettlement etc.

ii(a). Public consultation, including consultation with Communities located along the road, NGOs working in the area, other stake-holders and relevant Government departments at all the different stages of assignment (such as inception stage, feasibility stage, preliminary design stage and once final designs are concretized).

iii. Detailed Reconnaissance;

iv. Identification of possible improvements in the existing alignment and bypassing congested locations with alternatives, evaluation of different alternatives comparison on techno-economic and other considerations and recommendations regarding most appropriate option;

v. Traffic studies including traffic surveys and Axle load survey and demand forecasting for next thirty years;

vi. Inventory and condition surveys for road;

vii. Inventory and condition surveys for bridges, cross-drainage structures, other Structures, river Bank training/Protection works and drainage provisions;

viii. Detailed topographic surveys using LiDAR equipped with minimum engineering grade system or any other better technology having output accuracy not less than (a) specified in IRC SP 19 (b) Total Station (c) GPS/ DGPS. The use of conventional high precision instruments i.e Total Station or equivalent can be used at locations such as major bypasses, water bodies etc. where it may not be possible to survey using LiDAR. Use of mobile / Aerial LiDAR survey is preferable.

ix. Pavement investigations;

x. Sub-grade characteristics and strength: investigation of required sub-grade and sub-soil characteristics and strength for road and embankment design and sub soil investigation;

xi. Identification of sources of construction materials;

xii. Detailed design of road, its x-sections, horizontal and vertical alignment and design of embankment of height more than 6m and also in poor soil conditions and where density consideration require, even lesser height embankment.Detailed design of structures preparation of GAD and construction drawings and cross-drainage structures and underpasses etc.

xiii. Identification of the type and the design of intersections;

xiv. Design of complete drainage system and disposal point for storm water

xv. Value analysis / value engineering and project costing;

xvi. Economic and financial analyses;

xvii. Contract packaging and implementation schedule.

xviii Strip plan indicating the scheme for carriageway widening, location of all existing utility services (both over- and underground) and the scheme for their relocation, trees to be felled, transplanted and planted and land acquisition requirements including schedule for LA: reports documents and drawings arrangement of estimates for cutting/transplanting of trees and shifting of utilities from the concerned department;

xix Develop 3D engineered models of terrain and elevation, as-is project highway, proposed and project highway along with all features, currentand proposed structures, current and proposed utilities and land acquisition plans.

xx To find out financial viability of project for implementation and suggest the preferred mode on which the project is to be taken up.

xxi. Preparation of detailed project report, cost estimate, approved for construction Drawings, rate analysis, detailed bill of quantities, bid documents for execution of civil works through budgeting resources.

xxii. Design of toll plaza and identification of their numbers and location and office cum residential complex including working drawings

xxiii. Design of weighing stations, parking areas and rest areas.

xxiv. Any other user oriented facility en-route toll facility.

xxv. Tie-in of on-going/sanctioned works of MORT&H/ <Agency>/ other agencies.

xxvi. Preparation of social plans for the project affected people as per policy of the lending agencies/ Govt. of India R&R Policy.

4.2 While carrying out the field studies, investigations and design, the development plans being implemented or proposed for future implementation by the local bodies, should be taken into account. Such aspect should be clearly brought out in the reports and drawings.

4.3 The consultant shall study the possible locations and design of toll plaza, wayside amenities required and arboriculture along the highway shall also be planned.

4.4 The local and slow traffic may need segregation from the main traffic and provision of service roads and physical barrier including fencing may be considered, wherever necessary to improve efficiency and safety.

4.5 **Standards and Codes of Practices**

1. All activities related to field studies, design and documentation shall be done as per the latest guidelines/ circulars of MoRT&H and relevant publications of the Indian Roads Congress (IRC) and Bureau of Indian Standards (BIS). For aspects not covered by IRC and BIS, international standards practices, may be adopted. The Consultants, upon award of the Contract, may finalize this in consultation with <Agency> and reflect the same in the inception report.

2. All notations, abbreviations and symbols used in the reports, documents and drawings shall be as per IRC:71.

4.6 Quality Assurance Plan (QAP)

1. (i) The Consultants should have detailed Quality Assurance Plan (QAP) for all field studies including topographic surveys, traffic surveys, engineering surveys and investigations, design and documentation activities. The quality assurance plans/procedures for different field studies, engineering surveys and investigation, design and documentation activities should be presented as separate sections like engineering surveys and investigations, traffic surveys, material geo-technical and sub-soil investigations, road and pavement investigations, investigation and design of bridges & structures, environment and R&R assessment, economic & financial analysis, drawings and documentation, preparation, checking, approval and filing of calculations, identification and tractability of project documents etc. Further, additional information as per format shall be furnished regarding the details of personal who shall be responsible for carrying out/preparing and checking/verifying various activities forming part of feasibility study and project preparation, since inception to the completion of work. The detailed Draft QAP Document must be discussed and finalized with the

concerned <Agency> officers immediately upon the award of the Contract and submitted as part of the inception report.

(ii) It is imperative that the QAP is approved by <Agency> before the Consultants start the field work.

2. Data formats for report and investigation results

ii. Required data formats for some reports, investigations and documents are discussed in ENCLOSURE-II

iii. Formats for submission of Reports and Documents.

iv. The consultants will need to propose data formats for use in all other field studies and investigations not covered in enclosure II.

v. The proposed data forms will need to be submitted for the approval of <Agency> after the commencement of services.

4.7 Review of Data and Documents

1. The Consultants shall collect the available data and information relevant for the Study. The data and documents of major interest shall include, but not be limited to, the following:

i. Climate;

ii. Road inventory

iii Road condition, year of original construction, year and type of major maintenance/rehabilitation works;

iv. Condition of bridges and cross-drainage structures;

v. sub-surface and geo-technical data for existing bridges;

vi. Hydrological data, drawings and details of existing bridges;

vii Existing geological maps, catchment area maps, contour plans etc. for the project area

viii Condition of existing river bank / protection works, if any.

ix. Details of sanctioned/on-goingworks on the stretch sanctioned by MoRT&H/other agencies for Tie-in purposes

x. Survey and evaluation of locally available construction materials;

xi. Historical data on classified traffic volume (preferably for 5 years or more);

xii. Origin-destination and commodity movement characteristics; if available

xiii. Speed and delay characteristics; if available;

xiv. Commodity-wise traffic volume; if available;

xv. Accident statistics; and,

xvi. Vehicle loading behavior (axle load spectrum), if available.

xvii. Type and location of existing utility services (e.g. Fibre Optical Cable, O/H and U/G Electric, Telephone line, Water mains, Sewer, Trees etc.)

xviii. Environmental setting and social baseline of the project.

4.8. Social Analysis

The social analysis study shall be carried out in accordance with the MORT&H/World Bank/ADB Guidelines. The social analysis report will, among other things, provide a socio-economic profile of the project area and address in particular, indigenous people, communicable disease particularly HIV/AIDS poverty alleviation, gender, local population, industry, agriculture, employment, health, education, health, child labor, land acquisition and resettlement .

4.9 Traffic Surveys

All traffic surveys and studies will be completed in feasibility studies.

4.9.1 Number and Location of Survey Stations

1. The type of traffic surveys and the minimum number of survey stations shall normally be as under, unless otherwise specifically mentioned.

Sl.No.	Description	Numberof SurveyStations
1.	Classified Traffic Volume Count	3
2.	Origin-Destination and Commodity Movement Characteristics	Minimum 2
3.	Axle Loading Characteristics	2
4.	Intersection Volume Count	All Major Intersections
5.	Speed-Delay Characteristics	Project Road Section
6.	Pedestrian/animal cross traffic count	All major inhabitations along the highway
7.	Turning movement surveys	For all major intersections

2. The number of survey locations indicated in the table above are indicative only for each road stretch under a package. The Consultants shall, immediately upon award of the work, submit to <Agency>, proposals regarding the total number as well as the locations of the traffic survey stations as of inception report. Suitable maps and charts should accompany the proposals clearly indicating the rationale for selecting the location of survey Station.

3. The methodology of collection and analysis of data, number and location of traffic survey stations shall be finalized in consultation with <Agency>prior to start of the traffic survey.

4.9.2. Classified Traffic Volume Count Survey

1. Consultant shall make use of traffic survey done by Indian Highways Management Company Limited (IHMCL) using ATCC systems. However in isolated locations where there are site constraints, manual counting can be done. If required, especially in cases where a particular stretch is not covered by IHMCL, DPR consultant should carry out classified traffic volume count survey using ATCC systems or latest modern technologies.

2. Consultant shall use ATCC systems that can meet the following accuracy levels after validation/ calibration:

   (a) Classification of vehicles: better than 95%

   (b) Counting of vehicles: better than 98%

Before validation and calibration, the ATCC system shall meet the following accuracy levels:

(a) Classification of vehicles: better than 90%

(b) Counting of vehicles: better than 95%

For verification of above accuracy levels, audit of raw ATCC shall be done by the consultant on a sampling basis and should submit a certificate in this regard.

3. ATCC systems such as Pneumatic Tube Detector, Inductive Detector Loop, Video Image Detection, and Infrared Sensor or latest technologies shall be adopted.

4. The classified traffic volume count surveys shall be carried out for 7days (continuous, direction-wise) at the selected survey stations. The vehicle classification system as given in relevant IRC code may be followed. However, the following generalized classification system is suggested in view of the requirements of traffic demand estimates and economic analysis:

<table>
<tr><td colspan="3">Motorised Traffic</td><td>Non-Motorised Traffic</td></tr>
<tr><td colspan="3">2-Wheeler</td><td>Bi-Cycle</td></tr>
<tr><td colspan="3">3-Wheeler</td><td>Cycle-Rickshaw</td></tr>
<tr><td colspan="3">Passenger Car</td><td>Animal Drawn Vehicle (ADV)</td></tr>
<tr><td colspan="3">Utility Vehicle (Jeep, Van etc.)</td><td>Hand Cart</td></tr>
<tr><td colspan="3"></td><td>Other Non-Motorised Vehicle</td></tr>
<tr><td>Bus</td><td colspan="2">Mini Bus
Standard Bus</td><td rowspan="7"></td></tr>
<tr><td>LCV</td><td colspan="2">LCV-Passenger
LCV-Freight</td></tr>
<tr><td>Truck</td><td colspan="2">MCV : 2-Axle Rigid Chassis</td></tr>
<tr><td></td><td colspan="2">HCV : 3-Axle Rigid Chassis</td></tr>
<tr><td></td><td>MAV</td><td>Semi Articulated</td></tr>
<tr><td></td><td></td><td>Articulated</td></tr>
</table>

5. All results shall be presented in tabular and graphical form. The survey data shall be analyzed to bring out the hourly and daily variations. The traffic volume count per day shall be averaged to show a weekly average daily traffic (ADT) by vehicle type. The annual average daily traffic (AADT) shall be worked out by applying seasonal factors.

6. The consultant shall compile the relevant traffic volume data from secondary sources also. The salient features of traffic volume characteristics shall be brought out and variations if any, from the traffic census carried out by the State PWD shall be suitably explained.

4.9.3. Origin Destination and Commodity Movements Surveys

1. The consultants shall carry out 1-day (24 hour, both directions) O-D and commodity movement surveys at locations finalized in consultation with <Agency>. These will be essentially required around congested towns to delineate through traffic. The road side interviews shall be carried out on random sample basis and cover all four-wheeled vehicles. The location of the O-D survey and commodity movement surveys shall normally

be same as for the classified traffic count.

2. The location of origin and destination zones shall be determined in relation to each individual station and the possibility of traffic diversion to the Project Road from/to other road routes including bypasses.

3. The trip matrices shall be worked out for each vehicle type information on weight for trucks should be summed up by commodity type and the results tabulated, giving total weight and average weight per truck for the various commodity types. The sample size for each vehicle type shall be indicated on the table and also in the graphical representations.

4. The data derived from surveys shall also be analyzed to bring out the lead and load characteristics and desire line diagrams. The data analysis should also bring out the requirement for the construction of bypasses.

5. The distribution of lead and load obtained from the surveys should be compared. The axle load surveys shall normally be done using axle load pads or other sophisticated instruments. The location(s) of count station(s) and the survey with those derived from the axle load studies.

6. The commodity movement data should be duly taken into consideration while making the traffic demand estimates.

4.9.4. Turning Movement Surveys

1. The turning movement surveys for estimation of peak hour traffic for the design of major and minor intersections shall be carried out for the Study. The details regarding composition and directional movement of traffic shall be furnished by the Consultant.

2. The methodology for the surveys shall be as per IRC: SP: 41-1994. The details including location and duration of surveys shall be finalized in consultation with <Agency> officials. The proposal in response to this TOR shall clearly indicate the number of locations that the Consultants wish to conduct turning movement surveys and the rationale for the same.

3. The data derived from the survey should be analyzed to identify requirements of suitable remedial measures, such as construction of underpasses, fly-overs, interchanges, grade-separated intersections along the project road alignment. Intersections with high traffic volume requiring special treatments either presently or in future shall be identified.

4.9.5. Axle Load Surveys

1. Axle load surveys in both directions shall be carried out at suitable location(s) in the project road stretch on a random sample basis normally for trucks only (both empty and loaded trucks) for 2 normal days - (24 hours) at special count stations to be finalized in consultation with <Agency>. However, a few buses may be weighed in order to get an idea about their loading behavior. While selecting the location(s) of axle load survey station(s), the locations of existing bridges with load restrictions, if any, should be taken into account and such sites should be avoided.

2. Axle load surveys shall normally be done using axle load pads or other sophisticated instruments. The location(s) of count station(s) and the survey methodology including the data formats and the instrument type to be used shall be finalized before taking up the axle load surveys

3. The axle load data should be collected axle configuration-wise. The number of equivalent standard axles per truck shall be calculated on the basis of results obtained. The results of the survey should bring out the VDF for each truck type (axle configuration, if the

calculated VDF is found to be below the national average, then national average shall be used. Furthermore, the data from axle load surveys should be analyzed to bring out the Gross Vehicle Weight (GVW) and Single Axle Load (SAL) Distributions by truck type (axle configuration).

4. The Consultant shall ascertain from local enquiries about the exceptional live loads that have used the highway in the past in order to assess the suitability of existing bridges to carry such loads.

4.9.6. Speed-Delay Surveys

The Consultants shall carry out appropriate field studies such as moving car survey to determine running speed and journey speed. The data should be analyzed to identify sections with typical traffic flow problems and congestion. The objective of the survey would be to recommend suitable measures for segregation of local traffic, smooth flow of through traffic and traffic safety. These measures would include the provision of bypasses, under-passes, fly-overs, interchanges, grade-separated intersections and service roads.

4.9.7 Pedestrian / animal cross traffic surveys:

1. These shall be conducted to determine if provision of viaduct for pedestrians/animals is necessary to improve the traffic safety.

2. Consultant shall leverage information from local consultations, inputs from local governmental/ non-governmental agencies in selecting sites for checking pedestrian/ animal crossing traffic surveys.

3. Surveys for provision of pedestrian crossings shall minimum be conducted at all junctions being replaced by grade separators.

4.9.8 Truck Terminal Surveys

The data derived from the O-D, speed-delay, other surveys and also supplementary surveys should be analyzed to assess requirements for present and future development of truck terminals at suitable locations en route.

4.10. Traffic Demand Estimates

1. The consultants shall make traffic demand estimates and establish possible traffic growth rates in respect of all categories of vehicles, taking into account the past trends, annual population and real per capita growth rate, elasticity of transport demand in relation to income and estimated annual production increase. The other aspects including socio-economic development plans and the land use patterns of the region having impact on the traffic growth, the projections of vehicle manufacturing industry in the country, development plans for the other modes of transport, O-D and commodity movement behavior should also be taken into account while working out the traffic demand estimates.

2. The values of elasticity of transport demand shall be based on the prevailing practices in the country. The Consultants shall give complete background including references for selecting the value of transport demand elasticity.

3. It is envisaged that the project road sections covered under this TOR would be completed and opened to traffic after 3 years. The traffic demand estimates shall be done for a further period of 30 years from completion of two/four lane. The demand estimates shall be done assuming three scenarios, namely, optimistic, pessimistic and most likely traffic growth. The growth factors shall be worked out for five-yearly intervals.

4. Traffic projections should be based on sound and proven forecasting techniques. In case traffic demand estimated is to be made on the basis of a model, the application of the model in the similar situation with the validation of the results should be established. The traffic projections should also bring out the possible impact of implementation of any competing facility in the near future.The demand estimates should also take into account the freight and passenger traffic along the major corridors that may interconnect with the project. Impact of toll charges on the traffic estimates should be estimated.

5. The methodology for traffic demand estimates described in the preceding paragraphs is for normal traffic only. In addition to the estimates for normal traffic, the Consultants shall also work out the estimates for generated, induced and diverted traffic.

6. The traffic forecasts shall also be made for both diverted and generated traffic.

7. Overall traffic forecast thus made shall form the basis for the design of each pavement type and other facilities/ancillary works.

4.11. Engineering Surveys and Investigations

4.11.1. Reconnaissance and Alignment

1. The Consultants should make an in-depth study of the available land width (ROW) topographic maps, satellite imageries and air photographs of the project area, geological maps, catchment area maps, contour plans, flood flow data and seismological data and other available relevant information collected by them concerning the existing alignment. Consultant himself has to arrange the required maps and the information needed by him from the potential sources. Consultant should make efforts for minimizing land acquisition. Greater use of technology for LA be adopted by the consultant at the DPR stage so as to have a precise land acquisition process.

2. The detailed ground reconnaissance may be taken up immediately after the study of maps and other data. The primary tasks to be accomplished during the reconnaissance surveys include;

   (i). topographical features of the area;

   (ii). typical physical features along the existing alignment within and outside ROW i.e. land use Pattern;

   (iii). possible alignment alternatives, vis-a-vis, scheme for the construction of additional lanes parallel to the existing road;

   (iv). realignment requirements including the provision of bypasses, ROBs / Flyovers and via-duct for pedestrian crossings with possible alignment alternatives;

   (v). Preliminary identification of improvement requirements including treatments and measures needed for the cross-roads;

   (vi). traffic pattern and preliminary identification of traffic homogenous links;

   (vii). sections through congested areas;

   (viii). inventory of major aspects including land width, terrain, pavement type, carriageway type, bridges and structures (type, size and location), intersections (type, cross-road category, location) urban areas (location, extent), geologically sensitive areas, environmental features:

   (ix). critical areas requiring detailed investigations; and,

   (x). Requirements for carrying out supplementary investigations.

   (xi). soil (textural classifications) and drainage conditions

(xii). Type and extent of existing utility services along the alignment (within ROW).

(xiii). Typical physical features along the approach roads

Possible bridge locations, land acquisition problems, nature of crossings, likely length of approaches and bridge, firmness of banks, suitability of alignment of approach roads.

3. The data derived from the reconnaissance surveys are normally utilized for planning and programming the detailed surveys and investigations. All field studies including the traffic surveys should be taken upon the basis of information derived from the reconnaissance surveys.

4. The data and information obtained from the reconnaissance surveys should be documented. The data analysis and the recommendations concerning alignment and the field studies should be included in the Inception Report. The data obtained from the reconnaissance surveys should form the core of the database which would be supplemented and augmented using the data obtained from detailed field studies and investigations.

5. The data obtained from the reconnaissance surveys should be compiled in the tabular as well as graphical (chart) form indicating the major physical features and the proposed widening scheme for <Agency>'s comments. The data and the charts should also accompany the rationale for the selection of traffic survey stations.

4.11.2. Topographic Surveys

1. The basic objective of the topographic survey would be to capture the essential ground features along the alignment in order to consider improvements and for working out improvements, rehabilitation and upgrading costs. The detailed topographic surveys should normally be taken up after the completion of reconnaissance surveys.

2. The carrying out of topographic surveys will be one of the most important and crucial field tasks under the project. Technologies which can meet the following accuracy levels shall be adopted. For land based surveys (a) Fundamental horizontal accuracy of 5cm or better (b) Fundamental vertical accuracy of 5cm or better (c) More than 50 points shall be measured per sq. m and for aerial based surveys (a) Fundamental horizontal accuracy of 5 cm or better (b) Fundamental vertical accuracy of 5 cm or better (c) More than 10 points shall be measured per sq. m. To establish accuracy, a check point survey using DGPS (for horizontal accuracy) and Auto Level (for vertical accuracy) shall be carried out to establish the fundamental horizontal and vertical accuracy. A minimum of 25 check points, or check points once every 4 km should be established, and these should be strictly different from any geo-referencing or control network points.

3. The following are the set of deliverables which should be submitted after completion of survey:

(a). Raw DGPS data for the entire highway length and adjoining areas of interest

(b). Point cloud data or equivalent for the entire highway length and adjoining areas of interest in a format/ platform as per industry good practice which shall be amenable to operations by <Agency>/ Consultant. <Agency> may decide about format/ platform of point cloud data

(c). Topographic map of scale 1:1000 of the entire highway length and adjoining areas of interest

(d). Contour map of 50 cm of entire highway length and adjoining areas of interest

(e). Cross section of the highway at every 50 m in drawing format.

(f). Develop a digital elevation/surface model (bare earth model from survey data) digital terrain model combining topographic data from LiDAR, road inventory and other available sources of data for use while modeling the road alignment and road and structure design.

(g). For land based surveys, Mobile LiDAR (Light Detection and Ranging) or better technology that can meet above requirements shall be adopted. For aerial based surveys, Aerial Mobile LiDAR (Light Detection and Ranging) or better technology that can meet above requirements shall be adopted. Where possible, mobile/terrestrial LiDAR and total station or better studies should be used to supplement aerial LiDAR for the final alignment chosen. Aerial based surveys shall be used as the primary source of topographical data only in cases where a new/green field alignment is being planned and/or major junctions are being planned where it is necessary to significantly increase the survey corridor beyond the capabilities of mobile LiDAR. In shadow areas such as invert levels below culverts, terrestrial LiDAR shall be used where LiDAR or better technologies cannot survey accurately, traditional methods of Total Station/ Auto Level shall be used to complete the study.

(h). In case of mobile LiDAR or better technology, 360 degree panoramic images of the entire highway length and adjoining areas of interest shall be submitted. In case of aerial LiDAR or better technology, ortho-images of the entire highway length and adjoining areas of interest shall be submitted.

(i). The detailed field surveys would essentially include the following activities:

i. Topographic Surveys along the Existing Right of Way (ROW): Carrying out topographic survey using LiDAR or better technology along the existing road and realignments, wherever required and properly referencing the same with reference pillars fixed on either side of the centre-line at safe places within the ROW

ii. The detailed field surveys would essentially include the topographic surveys along the proposed location of bridge and alignment of approach road.

iii. The detailed topographic surveys should be carried out along the approach roads alignment and location of bridge approved by <Agency>.

iv. Collection/ Extraction of details for all features such as structures (bridges, culverts etc.) utilities, existing roads, electric and telephone installations (both O/H as well as underground), huts, buildings, fencing and trees (with girth greater than 0.3metre) oil and gas lines etc. falling within the extent of survey.

4. The width of survey corridor will generally be as given under:

(i). The width of the survey corridor should take into account the layout of the existing alignment including the extent of embankment and cut slopes and the general ground profile. While carrying out the field surveys, the widening scheme (i.e. right, left or symmetrical to the centre line of the existing carriageway) should be taken into consideration so that the topographic surveys cover sufficient width beyond the centre line of the proposed divided carriageway. Normally the surveys should extend a minimum of 30 m beyond either side of the centre line of the proposed divided carriageway or land boundary whichever is more.

(ii). In case the reconnaissance survey reveals the need for bypassing the congested locations, the traverse lines would be run along the possible alignments in order to identify and select the most suitable alignment forthe bypass. The detailed topographic surveys should be carried out along the bypass alignment approved by <Agency>. At locations where grade separated intersections could be the obvious choice, the survey area will be suitably increased. Field notes of the survey

should be maintained which would also provide information about traffic, soil, drainage etc.

(iii). The width of the surveyed corridor will be widened appropriately where developments and / or encroachments have resulted in a requirement for adjustment in the alignment, or where it is felt that the existing alignment can be improved upon through minor adjustments.

(iv). Where existing roads cross the alignments, the survey will extend minimum of 100 m either side of the road centre line and will be of sufficient width to allow improvements, including at grade intersection to be designed.

8. The surveyed alignment shall be transferred on to the ground as under:

i. Reference Pillar and Bench Mark / Reference pillar of size 15 cm X 15 cm X 45cm shall be cast in RCC of grade M 15 with a nail fixed in the centre of the top surface. The reference pillar shall be embedded in concrete upto a depth of 30cm with CC M10 (5 cm wide all around). The balance 15 cm above ground shall be painted yellow. The spacing shall be 250m apart, incase Bench Mark Pillar coincides with Reference Pillar, only one of the two need be provided.

ii. Establishing Bench marks at site connected to GTS Bench marks at an interval of 250 metres on Bench mark pillar made of RCC as mentioned above with RL and BM No. marked on it with red paint.

iii. **Boundary Pillars**- Wherever the proposed alignment follows the existing alignment, the boundary pillars shall be fixed by the DPR consultant at an interval of 200m on either side of proposed Right of Way. Wherever there is a proposal of realignment of the existing Highway and/or construction of New Bypasses, Consultant shall fix boundary pillars along the proposed alignment on the extreme boundary on either side of the project Highway at 50 m interval. Boundary pillars shall be strictly provided as per IRC:25:1967.

4.11.2.1 Longitudinal and Cross-Sections

The topographic surveys for longitudinal and cross-sections shall cover the following:

i. Longitudinal section levels along final centre line shall be taken at every 10 m interval. The levels shall be taken at closer intervals at the curve points, small streams, and intersections and at the locations of change in elevation. The interval shall also be modified as per IRC:SP-19 for rolling, mountainous & steep terrain.

ii. Cross sections at every 50 m interval in full extent of survey covering sufficient number of spot levels on existing carriageway and adjacent ground for profile correction course and earth work calculations. Cross sections shall be taken at closer interval at curves. The interval shall be modified as per IRC SP 19 for rolling, mountainous & steep terrain.

iii. Longitudinal section for cross roads for length adequate for design and quantity estimation purposes.

iv. Longitudinal and cross sections for major and minor streams shall cover Cross section of the channel at the site of proposed crossing and few cross sections at suitable distance both upstream and downstream, bed level upto top of banks and ground levels to a sufficient distance beyond the edges of channel, nature of existing surface soil in bed, banks & approaches, longitudinal section of channel showing site of bridge etc. These shall be as per recommendations contained in IRC Special Publication No. 13 (Guidelines for the Design of Small Bridges and Culverts) and provisions of IRC:5 ("Standard Specifications & Code of Practice for Road Bridges, Section 1 – General Features of Design").

2. At feasibility study stage cross sections at 50m interval may be taken.

3. Consultants shall also develop an as-is map of the road including:

i. Geo-referenced digital map of as-is project highway

ii. Earth surface, road layers, utilities, buildings and trees with feature data extracted and mapped in layers, marked on the map and tabulated data provided separately.

iii. All road, surface, sub surface inventory, pavement investigation and soil survey data to be super-imposed as layers using geo-referencing data

4.11.2.2 Details of utility Services and Other Physical Features

1. The Consultants shall collect details of all important physical features along the alignment. These features affect the project proposals and should normally include buildings and structures, monuments, burial grounds, cremation grounds, places of worship, railway lines, stream / river / canal, water mains, sewers, gas/oil pipes, crossings, trees, plantations, utility services such as electric, and telephone lines (O/H & U/G) and poles, optical fibre cables (OFC) etc. The survey would cover the entire right-of-way of the road on the adequate allowance for possible shifting of the central lines at some of the intersections locations.

2. Consultant shall also map out sub-surface utilities. Accurate mapping and resolution of all sub-surface utilities up to a depth of 4 m shall be carried out. Differentiation between sub-surface utilities such as live electric cables, metallic utilities and other utilities shall be indicated and sub-surface utilities radargrams further processed into utility maps in formats such as PDF, JPEG and AutoCAD shall be furnished. To meet the accuracy levels, consultant shall use Ground Penetrating Radar, Induction Locator or better technologies.

3. The information collected during reconnaissance and field surveys shall be shown on a strip plan so that the proposed improvements can be appreciated and the extent of land acquisition with LA schedule, utility removals of each type etc. assessed and suitable actions can be initiated. Separate strip plan for each of the services involved shall be prepared for submission to the concerned agency.

4.11.3. Road and Pavement Investigations

The Consultants shall carry out detailed field studies in respect of road and pavement. The data collected through road inventory and pavement investigations should be sufficient to meet the input requirements of HDM-IV.

4.11.3.1 Road Inventory Surveys

1. Detailed road inventory surveys shall be carried out to collect details of all existing road and pavement features along the existing road sections using the technology i.e Network Survey vehicles. The inventory data shall include but not limited to the following:

i. Terrain (flat, rolling, mountainous);

ii. Land-use (agricultural, commercial, forest, residential etc) @ every kilometre;

iii. Carriageway width, surfacing type @ every 500m and every change of feature whichever is earlier;

iv. Shoulder surfacing type and width @ every 500m and every change of feature whichever is earlier;

v. Sub-grade / local soil type (textural classification) @ every 500m and every change of feature whichever is earlier;

vi. Horizontal curve; vertical curve

vii. Road intersection type and details, at every occurrence;

viii. Retaining structures and details, at every occurrence;

ix. Location of water bodies (lakes and reservoirs), at every occurrence;

x. Height of embankment or depth of cut @ every 200m and every change of feature whichever is earlier.

xi. Land width i.e. ROW

xii. Culverts, bridges and other structures (type, size, span arrangement and location)

xiii. Roadside arboriculture

xiv. Existing utility services on either side within ROW. There shall be a provision of utility corridor for appropriate categories / combination of utilities in the construction of new 4/6 laning of National Highways. Such structures shall be located at appropriate location preferably as close to the extreme edge of Right of Way (RoW). In this connection, guidelines contained in IRC:98 shall be followed.

xv. General drainage conditions

xvi. Design speed of existing road

2. The data should be collected in sufficient detail. The data should be compiled and presented in tabular as well as graphical form. The inventory data would be stored in computer files using simple utility packages, such as EXCEL.

4.11.3.2 Pavement Investigation

1. Pavement Composition

i. The data concerning the pavement composition may be already available with the PWD. However, the consultants shall make trial pits to ascertain the pavement composition. The test pit interval will be as per Para 4 below.

ii. For each test pit, the following information shall be recorded:

- test pit reference (Identification number, location):
- pavement composition (material type and thickness); and
- subgrade type (textural classification) and condition (dry, wet)
- embankment (composition and geometry)

2. Road and Pavement Condition Surveys

i. Detailed field studies shall be carried out to collect road and pavement surface conditions. The data should generally cover:

- pavement condition (surface distress type and extent);
- shoulder condition;
- embankment condition; and
- drainage condition

Pavement Condition

- cracking(narrow and wide cracking), % of pavement area affected;

- raveling, % of pavement area affected;
- potholing, % of pavement areaaffected;
- edge break, length (m); and,
- rut depth, mm

Shoulder Condition

- Paved: Same as forpavement
- Unpaved: material loss, rut depth and corrugation,
- Edge drop, mm.

Embankment Condition

- general condition; and
- extent of slope erosion

ii. The objective of the road and pavement condition surveys shall be to identify defects and sections with similar characteristics. All defects shall be systematically referenced, recorded and quantified for the purpose of determining the mode of rehabilitation.

iii. In addition to visual means, the pavement condition surveys shall be carried out using Network Survey vehicles mounted with equipments such as high resolution cameras, digital laser profilometer, transverse profiler- the data from which should be geo-referenced using a DGPS receiver and in vehicle data processing software or equivalent technology to accurately measure the pavement surface properties covered earlier. This pavement condition survey shall also be used as a repository for civil work and shall be carried out as per the directions of <Agency>.

iv. Supplemented by actual measurements and in accordance with the widely accepted methodology (AASHTO, IRC, OECD, TRL and World Bank Publications) adapted to meet the study requirements. The measurement of rut depth would be made using standard straight edges.

v. The shoulder and embankment conditions shall be evaluated by visual means and the existence of distress modes (cuts, erosion marks, failure, drops) and extent (none, moderate, frequent and very frequent) of such distress manifestations would be recorded.

vi. For sections with severe distresses, additional investigations as appropriate shall be carried out to determine the cause of such distresses.

vii. Middle 200m could be considered as representative sample for each one km. of road and in case all other things are considered similar.

Drainage Condition

- General condition
- Connectivity of drainage turnouts into the natural topography
- Condition in cut sections
- Condition at high embankments

The data obtained from the condition surveys should be analyzed and the road segments of more or less equal performance may be identified using the criteria given in IRC: 81-1997.

3. Pavement Roughness

i. The roughness surveys shall be carried outusing a network survey vehicle mounted laser profilometer or better technology with specifications as described in para 2 above

i(a) In addition, the following criteria should be met by the process of defect detection:

- Roughness measurement with outputs of both raw longitudinal profiles and IRI calculation shall be reported at 100m referenced to the preceding LRP. The roughness must meet ASTM-E950 (equivalent to Class I road profiler).

- The IRI shall be determined for both wheelpaths over a minimum length of 250m for a minimum of 6 calibration sites with a roughness range between 2m/km and 8m/km. Calibration shall be made for speeds of 20, 30, 40, 50, 60 km/h.

ii. The surveys shall be carried out along the outer wheel paths. The surveys shall cover a minimum of two runs along the wheel paths for each direction.

iii. The results of the survey shall be expressed in terms of BI and IRI and shall be presented in tabular and graphical forms. The processed data shall be analyzed using the cumulative difference approach to identify road segments homogenous with respect to surface roughness.

4. Pavement Structural Strength

1. **The Consultants shall carry out structural strength surveys for existing pavements using** Falling Weight Deflectometer (FWD) in accordance with IRC 115 or IRC 117 as the case may be.

i. It is suggested that the deflection surveys may be carried out as per the scheme given below:

- mainline testing; and,
- Control section testing.

ii. The deflection tests for the mainline shall be carried out at every 500 m along theroad sections covered under the study. The control section testing shall involve carrying out deflection testing for each 100 m long homogenous road segment along the road sections. The selection of homogenous segment shall be based on the data derived from pavement condition surveys. The total length of such homogenous segments shall not be less than 100 m per kilometre. The deflection measurements for the control section testing should be at an interval of not more than 10 m.

iii. Test pits shall be dug at every 500 m and also along each homogeneous road segment to obtain pavement composition details (pavement course, material type and thickness) so as to be able to study if a correlation exists between deflection and composition. If so, the relationship may be used while working out the overlay thickness for the existing pavement.

iv. Falling weight deflectometre surveys may not be carried out for severely distressed sections of the road warranting reconstruction. The Consultants, immediately upon the award of the contract, shall submit to <Agency> the scheme describing the testing schedule including the interval. The testing scheme shall be supported by data from detailed reconnaissance surveys.

v. It is mandatory for the consultant to use Falling weight deflectometre or alternative better technique for the evaluation of pavement strength, details of such methods or innovative features for deflection testing using Falling weight deflectometre along with the methodology for data analysis, interpretation and the use of such data for pavement overlay design purposes using IRC or any other widely used practices, such as AASHTO guidelines, should be got approved by <Agency>. The sources of such methods should be properly referenced.

4.11.3.3 Subgrade Characteristics and Strength

2. Based on the data derived from condition (surface condition, roughness) and structural strength surveys, the project road section should be divided into segments homogenous with respect to pavement condition and strength. The delineation of segments homogenous with respect to roughness and strength should be done using the cumulative difference approach (AASHTO, 1993).

2. The data on soil classification and mechanical characteristics for soils along the existing alignments may already be available with the PWD. The testing scheme is, therefore, proposed as given under:

   (i). For the widening (2-Laning) of existing road within the ROW, the Consultants shall test at least three sub-grade soil samples for each homogenous road segment or three samples for each soil type encountered, whichever is more.

   (ii). For the roads along new alignments, the test pits for sub grade soil shall be @5km or for each soil type, whichever is more. A minimum of three samples should be tested corresponding to each homogenous segment.

3. The testing for subgrade soil shall include:

   (i). in-situ density and moisture content at each test pit

   (ii). Field CBR using DCP at each test pit

   (iii). Characterization (grain size and Atterberg limits) at each test pit and,

   (iv). Laboratory moisture-density characteristics (modified AASHTO compaction);

   (v). Laboratory CBR (unsoaked and 4-day soak compacted at three energy levels) and swell.

4. For problematic soils, the testing shall be more rigorous. The characteristics with regard to permeability and consolidation shall also be determined for these soils. The frequency of sampling and testing of these soils shall be finalized in consultation with the <Agency> officers after the problematic soil types are identified along the road sections.

5. The laboratory for testing of material should be got approved from <Agency> before start of work.

4.11.4 Investigations for Bridges and Structure

4.11.4.1 Inventory of Bridges, Culverts and Structures

The Consultants shall make an inventory of all the structures (bridges, viaducts, ROBs/RUB and other grade separated structures, culverts, etc.) along the road under the project. The inventory for the bridges, viaducts and ROBs shall include the parametres required as per the guidelines of IRC-SP:35. The inventory of culverts shall be presented in a tabular form covering relevant physical and hydraulic parametres.

4.11.4.2 Hydraulic and Hydrological Investigations

1. The hydrological and hydraulic studies shall be carried out in accordance with IRC Special Publication No. 13 ("Guidelines for the Design of Small Bridges and Culverts") and IRC:5 ("Standard Specifications & Code of Practice for Road Bridges, Section I General Feature of Design"). These investigations shall be carried out for all existing drainage structures along the road sections under the study.

2. The consultant shall also collect information on observed maximum depth of scour.

3. In respect of major bridges, history of hydraulic functioning of existing bridge, if any, under flood situation, general direction of river course through structure, afflux, extent and magnitude of flood, effect of backwater, if any, aggradation/degradation of bed, evidence of scour etc. shall be used to augment the available hydrological data. The presence of flood control/irrigation structures, if affecting the hydraulic characteristics like causing obliquity, concentration of flow, scour, silting of bed, change in flow levels, bed levels etc. shall be studied and considered in design of bridges. The details of any future planned work that may affect the river hydraulics shall be studied and considered.

4. The Consultants shall make a desk study of available data on topography (topographic maps, stereoscopic aerial photography), storm duration, rainfall statistics, top soil characteristics, vegetation cover etc. so as to assess the catchment areas and hydraulic parametres for all existing and proposed drainage provisions. The findings of the desk study would be further supplemented and augmented by a reconnaissance along the area. All-important hydrological features shall be noted during this field reconnaissance.

5. The Consultants shall collect information on high flood level (HFL), low water levels (LWL), high tide level (HTL), low tide level (LTL) where applicable, discharge velocity etc. from available past records, local inquiries and visible signs, if any, on the structural components and embankments. Local inquiries shall also be made with regard to the road sections getting overtopped during heavy rains.

6. Conducting Model studies for bridges is not covered in the scope of consultancy services. If Model study is envisaged for any bridge, requirement of the same shall be spelt out in the RPF documents separately indicating scope and time frame of such study. Salient features of the scope of services to be included for model study are given in the supplement- II Terms of Reference.

4.11.4.3 Condition Surveys for Bridges, Culverts and Structures

1. The Consultants shall thoroughly inspect the existing structures and shall prepare a report about their condition including all the parametres given in the Inspection pro-forma of IRC-SP:35. The condition and structural assessment survey of the bridges / culverts / structures shall be carried out by senior experts of the Consultants.

3. For the bridges identified to be in a distressed condition based upon the visual condition survey, supplementary testing shall be carried out as per IRC-SP:35 and IRC-SP:40. Selection of tests may be made based on the specific requirement of the structure.

3. The assessment of the load carrying capacity or rating of existing bridges shall be carried out under one or more of the following scenarios:

    i. when the design live load is less than that of the statutory commercial vehicle plying or likely to ply on bridge;

    ii. if during the condition assessment survey and supplementary testing the bridge is found to indicate distress of serious nature leading to doubt about structural and /

or functional adequacy, and

iii. Design live load is not known nor are the records and drawings available.

4. The evaluation of the load carrying capacity of the bridge shall be carried out as per IRC-SP:37 ("Guidelines for Evaluation of Load Carrying Capacity of Bridges"). The analytical and correlation method shall be used for the evaluation of the load carrying capacity as far as possible. When it is not possible to determine the load carrying capacity of the bridge using analytical and correlation method, the same shall be carried out using load testing. The consultant has to exhaust all other methods of evaluation of strength of bridges before recommending to take up load testing of bridges. Road closure for testing if unavoidable shall be arranged by <Agency> for limited duration say 12 hours or so.

5. Consultant shall carry out necessary surveys and investigations to establish the remaining service life of each retainable bridge or structure with and without the proposed strengthening and rehabilitation according to acceptable international practice in this regard.

4.11.4.4 Geo-technical Investigations and Sub-Soil Exploration

1. The Consultants shall carry out geo-technical investigations and sub-surface explorations for the proposed Bridges / Road over bridges/ tunnels/ viaducts/ interchanges etc., along high embankments and any other location as necessary for proper design of the works and conduct all relevant laboratory and field tests on soil and rock samples. The minimum scope of geo-technical investigations for bridge and structures shall be as under:

S.No.	Description	Location of Boring
1	Overall length = 6 – 30 m	One abutment location and at least one intermediate location between abutments for structures having more than one span
2	Overall length = 30 – 60 m	One abutment location and at least one intermediate location between abutments for structures having more than one span.
3	Overall length >60 m	Each abutment and each pier locations.

2. The deviation(s), if any, by the Consultants from the scheme presented above should be approved by <Agency>.

3. However, where a study of geo-technical reports and information available from adjacent crossings over the same waterway (existing highway and railway bridges) indicates that subsurface variability is such that boring at the suggested spacing will be insufficient to adequately define the conditions for design purposes, the Consultants shall review and finalize the bore hole locations in consultation with the <Agency> officers.

4. Geotechnical Investigations and Sub-soil Exploration shall be carried out to determine the nature and properties of existing strata in bed, banks and approaches with trial pits and bore hole sections showing the levels, nature and properties of various strata to a sufficient depth below the level suitable for foundations, safe intensity of pressure on the foundation strata, proneness of site to artesian conditions, seismic disturbance and other engineering properties of soil etc. Geotechnical investigation and Sub-soil Exploration will be done as per IRC 78.

5. The scheme for the borings locations and the depth of boring shall be prepared by the Consultants and submitted to <Agency> for approval. These may be finalized in consultation with <Agency>.

6. The sub-soil exploration and testing should be carried out through the Geotechnical Consultants empanelled by MORT&H. The soil testing reports shall be in the format prescribed in relevant IRC Codes.

7. For the approach road pavement, bore holes at each major change in pavement condition or in deflection readings or at 2 km intervals whichever is less shall be carried out to a depth of at least 2 m below embankment base or to rock level and are to be fully logged. Appropriate tests to be carried out on samples collected from these bore holes to determine the suitability of various materials for use in widening of embankments or in parts of new pavement structure.

4.11.5. Material Investigations

1. The Consultants shall identify sources (including use of fly-ash/ slag), quarry sites and borrow areas, undertake field and laboratory testing of the materials to determine their suitability for various components of the work and establish quality and quantity of various construction materials and recommend their use on the basis of techno-economic principles. The Consultants shall prepare mass haul diagram for haulage purposes giving quarry charts indicating the location of selected borrow areas, quarries and the respective estimated quantities.

"Environment friendly materials"

"As per MORTH circular No. RW /NH-33044/53/2013-S&R(R) dated 20th November, 2013, alternative pavement materials and technologies for road construction shall be assessed and compared in the design stage. The alternative resulting in substantial reduction in GHG emission and with least life cycle cost shall be recommended for implementation.

Technical and economic feasibility of using industrial byproducts, recyclable and waste materials shall be assessed depending on their availability in the concerned region.

2. It is to be ensured that no material shall be used from the right-of-way except by way of leveling the ground as required from the construction point of view, or for landscaping and planting of trees etc. or from the cutting of existing ground for obtaining the required formation levels.

3. Environmental restrictions, if any, and feasibility of availability of these sites to prospective civil works contractors, should be duly taken into account while selecting new quarry locations.

4. The Consultants shall make suitable recommendations regarding making the borrow and quarry areas after the exploitation of materials for construction of works.

5. TheMaterial Investigation aspect shall include preparation and testing of bituminous mixes for various layers and concrete mixes of different design mix grades using suitable materials (binders, aggregates, sand filler etc.) as identified during Material Investigation to conform to latest MoRT&H specification.

4.12 Detailed Design of Road and Pavements, Bridges, Structures

4.12.1 General

1. The Consultants are to carryout detailed designs and prepare working drawings for the following:

   i. High speed highway with divided carriageway configuration complete in all

respects with service roads at appropriate locations;

ii. Design of pavement for the additional lanes and overlay for the existing road, paved shoulders, medians, verges;

iii. Bridges, viaduct/subways and other grade separated structures including ROBs/RUBs etc.

iv. At-grade and grade-separated intersections, interchanges (if required);

v. ROB for railway crossings as per the requirement and the standards of the Indian Railways; and,

vi. Prepare alignment plans, longitudinal sections and cross-sections @ 50m intervals;

vii. Designs for road furniture and road safety/traffic control features;

viii. Designs and drawings for service road/under passes/overpass / cattle passes tree planting/fencing at locations where necessary / required

ix. Toll plazas and office-cum-residential complex for <Agency> (one for each civil contract package)

x. Short bypasses at congested locations

xi. Drainage design showing location of turnouts, out falling structures, separate drawings sheet for each 5 km. stretch.

xii. Bridges and structures rehabilitation plan with design and drawings

xiii. Traffic amenities (Parking Areas, Weighing Station and Rest Areas, etc.).

xiv. Design of pavement for approach road

xv. Design of river bank protection/training works. Innovative type of structures with minimum joints, aesthetically, pleasing and appropriate to the topography of the region shall be designed wherever feasible.

4.12.2. Design Standards

1. The Consultants shall evolve Design Standards and material specifications for the Study primarily based on IRC publications, MoRT&H Circulars and relevant recommendations of the international standards for approval by <Agency>.

2. The Design Standards evolved for the project shall cover all aspects of detailed design including the design of geometric elements, pavement design, bridges and structures, traffic safety and materials.

4.12.3. Geometric Design

1. The design of geometric elements shall, therefore, take into account the essential requirements of such facilities.

2. Based on the data collected from reconnaissance and topographic surveys, the sections with geometric deficiencies, if any, should be identified and suitable measures for improvement should be suggested for implementation.

3. The data on accident statistics should be compiled and reported showing accident type and frequency so that black spots are identified along the project road section. The possible causes (such as poor geometric features, pavement condition etc.) of accidents should be investigated into and suitable cost-effective remedial measures suggested for implementation.

4. The detailed design for geometric elements shall cover, but not be limited to the following major aspects:

   i. horizontal alignment;

   ii. longitudinal profile;

   iii. cross-sectional elements, including refuge lane (50m) at every 2kms.

   iv. junctions, intersections and interchanges;

   v. bypasses; and,

   vi. service roads as and when require i.e built up area.

5. The alignment design shall be verified for available sight distances as per the standard norms. The provision of appropriate markings and signs shall be made wherever the existing site conditions do not permit the adherence to the sight distance requirements as per the standard norms.

6. The consultants shall make detailed analysis of traffic flow and level of service for the existing road and workout the traffic flow capacity for the improved project road. The analysis should clearly establish the widening requirements with respect to the different horizon periods taking into account special problems such as road segments with isolated steep gradients.

7. In the case of closely spaced cross roads the Consultant shall examine different options such as, providing grade separated structure for some of them with a view to reduce number of at-grade crossings, services roads connecting the cross-roads and closing access from some of the intersections and prepare and furnish appropriate proposals for this purpose keeping in view the cost of improvement, impact on traffic movement and accessibility to cross roads. The detailed drawings and cost estimate should include the provisions for realignments of the existing cross roads to allow such arrangements.

8. The Consultant shall also prepare design of grade separated pedestrian crossings (viaducts) for large cross traffic of pedestrians and / or animalson the basis of passenger and animal cross traffic surveys conducted.

9. The Consultant shall also prepare details for at-grade junctions, which may be adopted as alternative to the grade separated structures. The geometric design of interchanges shall take into account the site conditions, turning movement characteristics, level of service, overall economy and operational safety.

10. The Consultants shall prepare design and other details in respect of the parallel service roads in urbanized locations and other locations to cater to the local traffic, their effect of the viability of the project on commercial basis if service roads are constructed as part of the project and the implications of not providing the service roads.

11. The consultant shall prepare complete road and pavement design including drainage for new bypass option identified around congested town en-route.

4.12.4. Pavement Design

1. The detailed design of pavement shall involve:

   i. strengthening of existing road pavement and design of the new pavement if any, if the findings of the traffic studies and life-cycle costing analysis confirm the requirement for widening of the road beyond 2lane undivided carriageway standard;

ii. Pavement design for bypasses; and,

iii. Design of shoulders.

2. The design of pavement shall primarily be based on IRC publications.

3. The design of pavement shall be rigorous and shall make use of the latest Indian and International practices. **The design alternatives shall include both rigid and flexible design options. The most appropriate design, option shall be established on life-cycle costing and techno-economic consideration.**

4. For the design of pavement, each set of design input shall be decided on the basis of rigorous testing and evaluation of its suitability and relevance in respect of in-service performance of the pavement. The design methodology shall accompany the design proposals and shall clearly bring out the basic assumptions, values of the various design inputs, rationale behind the selection of the design inputs and the criteria for checking and control during the implementation of works. In other words, the design of pavement structure should take due account of the type, characteristics of materials used in the respective courses, variability of their properties and also the reliability of traffic predictions. Furthermore, the methodology adopted for the design of pavement shall be complete with flowcharts indicating the various steps in the design process, their interaction with one another and the input parametre required at each step.

5. For the design of overlays for the existing 2-lane pavement, the strengthening requirement shall duly take into account the strength of the existing pavement vis-à-vis the remaining life. The overlay thickness requirements shall be worked out for each road segment homogenous with respect to condition, strength and sub- grade characteristics. The rehabilitation provisions should also include the provision of regulating layer. For existing pavement with acceptable levels of cracking, provision of a crack inhibiting layer should also be included.

5 (a) For rehabilitation and strengthening, consultant shall consider the alternatives of rehabilitating the existing pavement, overlaying with the same or alternate pavement type (e.g. white/black topping) and also the option of removal and replacement of existing pavement layers and chose the best alternative basis lifecycle costing, and any local considerations such as material availability, time available for construction etc.

6. Latest techniques of pavement strengthening like provision of geo-synthetics and cold/hot pavement recycling should be duly considered by the consultant for achieving economy. The use of technology particularly environment friendly technology viz. recycling of bituminous mixes, warm mixes and soil stabilization etc. should be adopted wherever feasible. Clause 519 of the "Specifications for Road and Bridge Works" (Fifth Revision) covers specifications for recycling of existing bituminous pavement materials to upgrade the pavements. These provisions not withstanding, recycling of existing bituminous materials is yet to be implemented in most of the <Agency> projects. The reclaiming and reprocessing of pavement materials involve both design (how the pavement should be designed using reclaimed materials with the given properties) and technology (the methods to reclaim and reprocess, equipment, knowhow and quality) issues. After addressing these issues, the recycling of pavements will be environmentally and economically better option for rehabilitation, repair or reconstruction compared to the use of fresh or virgin materials. Indian Road Congress has published IRC: 120-2015 on "recommended practice for recycling of bituminous pavements" giving a detailed procedure for its implementation

7. The paved shoulders shall be designed as integral part of the pavement for the main carriageway. The design requirements for the carriageway pavement shall, therefore, be applicable for the design of shoulder pavements. The design of granular shoulder should

take into account the drainage considerations besides the structural requirements.

8. The pavement design task shall also cover working out the maintenance and strengthening requirements and periodicity and timing of such treatments.

4.12.5. Design of Embankments

1. The embankments design should provide for maximum utilization of locally available materials consistent with economy. Use of fly ash wherever available with in economical leads must be considered. In accordance with Government instructions, **use of fly ash within 300 km from Thermal Power Stations is mandatory** as per extra ordinary Gazette Notification No. S.O. 254 (E) Part Section – III – Sub Section (ii) dated 25th January, 2016 and subsequent amendment, if any of Ministry of Environment, Forest and Climate change, New Delhi.

2. The Consultants shall carry out detailed analysis and design for all embankments of height greater than 6 m based on relevant IRC publications.

3. The design of embankments should include the requirements for protection works and traffic safety features.

4.12.6. Design of Bridges and Structures

1. The data collected and investigation results shall be analyzed to determine the following:

i. HFL
ii. LWL
iii. LBL
iv. Erodibility of bed/scour level
v. Design discharge
vi. Linear waterway and effective linear waterway
vii. Likely foundation depth
viii. Safe bearing capacity
ix. Engineering properties of sub soil
x. Artesian conditions
xi. Settlement characteristics
xii. Vertical clearance
xiii. Horizontal clearance
xiv. Free board for approach road
xv. Severity of environment with reference to corrosion
xvi. Data pertaining to seismic and wind load
xvii. Requirement of model study etc.

2. The Consultant shall prepare General Arrangement Drawing (GAD) and Alignment Plans the salient features of the bridges and structures proposed to be constructed / reconstructed along the road sections covered under the Study. These salient features such as alignment, overall length, span arrangement, cross section, deck level, founding level, type of bridge components (superstructure, substructure, foundations, bearings, expansion joint, returnwalls etc.) shall be finalized based upon hydraulic and geo-technical

studies, cost effectiveness and ease of construction. The GAD shall be supplemented by Preliminary designs. In respect of span arrangement and type of bridge a few alternatives with cost-benefit implications should be submitted to enable <Agency> to approve the best alternative. After approval of alignment and GAD the Consultant shall prepare detailed design as per IRC codes /guidelines and working drawings for all components of bridges and structures.

3. The location of all at-grade level crossings shall be identified falling across the existing level crossings for providing ROB at these locations. The Consultants shall prepare preliminary GAD for necessary construction separately to the Client. The Consultant shall pursue the Indian Railways Authorities or/and any statutory authority of State/Central Government for approval of the GAD from concerned Authorities.

4. GAD for bridges/structures across irrigation/water way channels shall be got approved from the concerned Irrigation/Water way Authorities. Subsequent to approval of GAD and alignment plan by <Agency>, the Consultants shall prepare detailed design as per IRC codes/guidelines for all components of the bridges and structures.

5. Subsequent to the approval of the GAD and Alignment Plan by <Agency> and Railways, the Consultant shall prepare detailed design as per IRC and Railways guidelines and working drawings for all components of the bridges and structures. The Consultant shall furnish the design and working drawings for suitable protection works and/or river training works wherever required.

6. Dismantling/reconstruction of existing structures shall be avoided as far as possible except where considered essential in view of their poor structural conditions/ inadequacy of the provisions etc.

7. The existing structures having inadequate carriageway width shall be widened/reconstructed in part or fully as per the latest MoRT&H guidelines. The Consultant shall furnish the detailed design and working drawings for carrying out the above improvements.

8. Suitable repair/rehabilitation measures shall be suggested in respect of the existing structures as per IRC-SP:40 along with their specifications, drawings and cost estimate in the form of a report. The rehabilitation or reconstruction of the structures shall be suggested based on broad guidelines for rehabilitation and strengthening of existing bridges contained in IRC-SP:35 and IRC-SP:40.

9. Subsequent to the approval of the GAD and the alignment plan by <Agency>, detailed design shall also be carried out for the proposed underpasses, overpasses and interchanges.

10. The Consultants shall also carry out the design and make suitable recommendations for protection works for bridges and drainage structures.

11. In case land available is not adequate for embankment slope, suitable design for RCC retaining wall shall be furnished. However, RES wall may also be considered depending upon techno-economic suitability to be approved by <Agency>.

12. All the bridge structures having a length of 100 m or less can be used for tapping of water for serving dual purpose i.e., to cross the water body or to store water, if technically feasible. Therefore, such structures shall be designed as bridge cum barrage structures (bridge cum bandhara). Ministry's guidelines in this regard issued vide letter no. RW/NH-34066/89/2015-S&R(B) dated 18.04.2017 may be referred.

4.12.7. Drainage System

1. The requirement of roadside drainage system and the integration of the same with proposed cross-drainage system shall be worked out for the entire length of the project road section.

2. In addition to the roadside drainage system, the Consultants shall design the special drainage provisions for sections with super-elevated carriageways, high embankments and for road segments passing through cuts. The drainage provisions shall also be worked out for road segments passing through urban areas.

3. The designed drainage system should show locations of turnouts/outfall points with details of outfall structures fitting into natural contours. A separate drawing sheet covering every 5 km. stretch of road shall be prepared.

4. The project highway shall be designed to have well designed efficient drainage system, which shall be subsurface, as far as possible. While constructing the underpasses, the finished road level shall be determined so as to ensure that the accumulation of rain water does not take place and run-off flows at the natural ground level. The drains, wherever constructed, shall be provided with proper gradient and connected to the existing outlets for final disposal.

5. The rain water harvesting requirements be assessed taking into consideration the Ministry of Environment & Forest Notification Dt. 14.01.1997 (as amended on 13.01.1998, 05.01.1999 & 06.11.2000). The construction of rainwater harvesting structure is mandatory in and around water scarce / crisis areas notified by the Central Ground Water Board. The provisions for rainwater harvesting be executed as per the requirements of IRC:SP:42-2014 (Guidelines for Road Drainage) and IRC:SP:50-2013 (Guidelines on Urban Drainage).

6. All the bridge structures having a length of 100m or less can be used for tapping of water for serving dual purpose i.e. to cross the water body and to store water, if technically feasible. Therefore, such structures should be designed as bridge cum barrage structures (bridge cum bandhara). Ministry's guidelines in this regard issued vide letter no. RW/NH-34066/59/2015-S&R(B) dated 18.04.2017 may be referred.

7. The locations of the culverts should be planned in such a way that the proposed culvert covers optimum catchment area & the location shall be decided on the basis of topographical survey, local rainfall data, gradient of natural ground and enquiry from the local habitants. All culverts should preferably be box culverts as pipe culverts get filled up with silt, which is rarely cleared.

4.12.8. Traffic Safety Features, Road Furniture and Road Markings

1. The Consultants shall design suitable traffic safety features and road furniture including traffic signals, signs, markings, overhead sign boards, crash barriers, delineators etc. The locations of these features shall be given in the reports and also shown in the drawings.

2. The Consultant should make the provisions for "the overhead (gantry-mounted) signs on roads with two or more lanes in the same direction" as per provisions of IRC-67. The minimum height of gantry mounted signbe 5.5 m above the highest point at the carriageway.

3. Road safety shall be the focus of design. The roads shall be forgiving, having self-explaining alignment, safe designed intersections / interchanges segregation and safe crossing facilities for VRUs with crash barriers at hazardous locations. The details of traffic signs

and pavement markings with their locations, types and configuration shall be shown on the plan so that they are correctly provided.

4. DPR shall undergo the exercise of Road Safety Audit through the Road Safety Auditor (separate from design team) and recommendations mentioned be incorporated.

5. Road markings and proper signage constitute another important aspect of the Road safety. The DPR shall contain a detailed signage plan, indicating the places, directions, distances and other features, duly marked on the chainage plan. It shall specify the suitable places where FoBs are to be provided. Road marking and signage plan shall be included in DPR and shall be specifically approved by the <Agency>.

6. Advanced Traffic Management System (ATMS) shall be in place for all 4/6 lane roads of <Agency> being put to tolling. This would provide real time information, guidance and emergency assistance to users. ATMS would include outdoor equipment including emergency call boxes, variable message sign systems, meteorological data system, close circuit TV camera (CCTV) system in addition to any other equipment required to meet the objective. Indoor equipment would include large display board, central computer with Network Management System, CCTV monitor system and management of call boxes system with uninterrupted power supply, all housed in a central control centre. In this connection, <Agency>'s policy circular no.11041/218/2007-Admn dated 15.09.2016 may be referred.

7. As availability of suitable sight distance has a large effect on road safety, the alignment of all the NHs should be finalized in such a way so as to have doublethe stopping sight distance available to the road users at all locations.

4.12.9. Arboriculture and Landscaping

The Consultants shall work out appropriate plan for planting of trees (specifying type of plantation), horticulture, floriculture on the surplus land of the right-of way with a view to beautify the highway and making the environment along the highway pleasing. These activities should be included in the TOR for contractor/concessionaire and the cost of these activities shall also be added to the total project cost for civil works. The existing trees / plants shall be retained to the extent possible. The Transplantation of trees shall also be proposed wherever feasible.

4.12.10. Toll Plaza

1. The Consultants shall identify the possible toll plaza location(s) based on the data and information derived from the traffic studies and a study of the existing physical features including the availability of land. The location of the plaza should keep in view that the project road is to be developed as a partially access controlled highway facility and it is required to collect toll on rational basis from as much of the vehicular traffic as possible consistent with economy of collection and operations. The location of the toll plaza should be finalized in consultation with <Agency>.

2. The minimum number of toll lanes at the toll plazas should be carefully designed taking into consideration the projected peak hour tollable traffic, permissible service time, adopted toll collection system and the capacity of service lanes. The number of lanes at any toll plaza would, however, be not less than four times the number of lanes for which the highway has been designed. Eventually, all the lanes have to be designed / equipped with Electronic Toll Collection (ETC) systems and one lane at the extreme outer side for Over Dimensioned Vehicles (ODV) should be earmarked in each direction.

3. Car lanes and lanes for commercial vehicles shall be earmarked at the toll plaza with outer lanes earmarked for the commercial vehicles. At least 50% of the total lanes on each side

shall be equipped with weigh-in-motion facility for dedicated use by commercial vehicles followed by a static weigh bridge on either side. Number of lanes with weigh-in-motion facility may be suitably increased depending on proportion of commercial vehicles in total trafficProvision should be kept for acquisition and earmarking of about one acre area for parking of the overloaded vehicles.

4. Toll Plaza shall be designed as per IRC 84.

4.12.11. Weighing Station, Parking Areas and Rest Areas

1. The consultant shall select suitable sites for weighing stations, parking areas and rest areas and prepare suitable separate designs in this regard. The common facilities like petrol pump, first-aid medical facilities, police office, restaurant, vehicle parking etc. should be included in the general layout for planning. For petrol pump, the guidelines issued by OISD of Ministry of Petroleum shall be followed. The facilities should be planned to be at approximately 50 km interval. At least each facility (1 no.) is foreseen to be provided for this project stretch. Weighing stations can be located near toll plazas so that overloaded vehicles can be easily identified and suitably penalized and unloaded before being allowed to proceed further. The type of weighing system suitable for the project shall be brought out in the report giving merits of each type of the state-of-the art and basis of recommendations for the chosen system.

2. The Consultant should take into consideration the provisions for persons with disabilities (PwD) in way side amenity centres / rest areas and provide ramp facilities, exit / entrance door with minimum clear opening of 900 mm and special toilet facilities for use of handicapped persons. The consultant shall also take into consideration, the provisions for Pedestrians facilities as per IRC-103.

4.12.12 Miscellaneous Works

1. The Consultants shall make suitable designs and layout for miscellaneous works including rest areas, bus bays, vehicle parking areas, telecommunication facilities etc. wherever appropriate.

2. The Consultants shall prepare the detailed scheme and lay out plan for the works mentioned in Para 1.

3. The Consultants shall prepare detailed plan for the traffic management and safety during the construction period.

4.13 Environment and Social Impact Assessment

The consultant shall under take the detailed environmental and social impact assessment in accordance with the standard set by the Government of India for projects proposed to be funded by MORT&H/ <Agency>. In respect of projects proposed to be funded by ADB loan assistance, Environmental Assessment Requirements, Environmental Guidelines for selected infrastructure projects, 1993 of Asian Development Bank shall be followed. Similarly, for projects proposed to be funded by World Bank loan assistance, World Bank Guidelines shall be followed.

4.13.1 Environmental Impact Assessment

Environment impact assessment or initial environment examination be carried out in accordance with ADB's Environmental Assessment Requirements of ADB 1998 guidelines for selected infrastructure projects 1993 as amended from time to time/World Bank Guidelines / Government of India Guidelines, as applicable

1. The consultant should carry out the preliminary environmental screening to assess the direct and induced impacts due to the project.

2. The consultant shall ensure to document baseline conditions relevant to the project with the objective to establish the benchmarks.

3. The consultant shall assess the potential significant impacts and identify the mitigation measures to address these impacts adequately.

4. The consultant shall do the analysis of alternatives incorporating environmental concerns. This should include with and without scenario and modification incorporated in the proposed project due to environment considerations.

5. The consultant shall give special attention to the environmental enhancement measures in the project for the following:

   (a) Cultural property enhancement along the highways

   (b) Bus bays and bus shelters including a review of their location,

   (c) Highway side landscape and enhancement of the road junctions,

   (d) Enhancement of highway side water bodies, and

   (e) Redevelopment of the borrow areas located on public land.

6. The consultant shall prepare the bill-of-quantities (BOQ) and technical specifications for all items of work in such a way that these may be readily integrated to the construction contracts.

7. The consultant shall establish a suitable monitoring network with regard to air, water and noise pollution. The consultant will also provide additional inputs in the areas of performance indicators and monitoring mechanisms for environmental components during construction and operational phase of the project.

8. The consultant shall provide the cost of mitigation measures and ensure that environmental related staffing, training and institutional requirements are budgeted in project cost.

9. The consultant shall prepare the application forms and obtain forestry and environmental clearances from the respective authorities including the SPCBs and the MOEF on behalf of <Agency>. The consultants will make presentation, if required, in defending the project to the MOEF Infrastructure Committee.

10. The consultant shall identify and plan for plantation and Transplantation of the suitable trees along the existing highway in accordance with IRC guidelines.

11. The consultant shall assist in providing appropriate input in preparation of relevant environment and social sections of BPIP.

12 Provision should be made for Noise Barriers wherever (especially where project highway passes through dense habitation) required as a mitigation measure against noise pollution and nuisance. Their location, dimension, type, material and shapes should be determined and defined in environment impact assessment studies forming part of DPR.

4.13.2 Social Assessment

1 The consultant would conduct base line socio-economic and census survey to assess the

impacts on the people, properties and loss of livelihood. The socio economic survey will establish the benchmark for monitoring of R&R activities. A social assessment is conducted for the entire project to identify mechanisms to improve project designs to meet the needs of different stakeholders. A summary of stakeholder discussions, issue raised and how the project design was developed to meet stakeholders need would be prepared.

2 The consultant shall prepare Land Acquisition Plan and assist <Agency> in acquisition of land under various Acts.

4.13.3 The consultant would prepare Resettlement and Rehabilitation Plan and assess feasibility and effectiveness of income restoration strategies and suitability and availability to relocation sites. The resettlement plan which accounts for land acquisition and resettlement impacts would be based on a 25% socio-economic survey and 100 % census survey of project affected people which provides the complete assessment of the number of affected households and persons, including common property resources. All untitled occupants are recorded at the initial stages and identify cards will be issued to ensure there is no further influx of people in to the project area. All consultations with affected persons (to include list of participants) should be fully documented and records made available to <Agency>.

- Assessment on the impact of the project on the poor and vulnerable groups along the project road corridor.
- Based on the identified impacts, developing entitlement matrix for the project affected people.
- Assessment on social issues such as indigenous people, gender, HIV/AIDS, labourers including child labour.
- Implementation budgets, sources and timing of funding and schedule of tasks.
- Responsibility of tasks, institutional arrangements and personnel for delivering entitlement and plans to build institutional capacity.
- Internal and external monitoring plans, key monitoring indicators and grievance redress mechanism.
- Incorporating any other suggestions of the ADB/ World Bank/ <Agency>, till the acceptance of the reports by the ADB/ World Bank/ <Agency>

4.13.4Reporting Requirements of EIA

- The consultant would prepare the stand-alone reports as per the requirement of the ADB/World Bank /<Agency>, as applicable, with contents as per the following:
- Executive Summary
- Description of the Project
- Environmental setting of the project.
- Identification and categorization of the potential impacts (during pre-construction, construction and operation periods).
- Analysis of alternatives (this would include correlation amongst the finally selected alternative alignment/routing and designs with the avoidance and environmental management solutions).
- The public consultation process.
- Policy, legal and administrative framework. This would include mechanisms at the states and national level for operational policies. This would also include a

description of the organizational and implementation mechanism recommended for this project.

- Typical plan or specific designs for all additional environmental items as described in the scope of work.
- Incorporating any other as per the suggestions of the ADB/WorldBank/ <Agency>, till the acceptance of the reports by the ADB/ World Bank/<Agency>, as applicable.
- EMP Reports for Contract Package based on uniform methodology and processes. The consultant will also ensure that the EMP has all the elements for it to be a legal document. The EMP reports would include the following:
- Brief description of the project, purpose of the EMP, commitments on incorporating environmental considerations in the design, construction and operations phases of the project and institutional arrangements for implementing the EMP.
- A detailed EMP for construction and operational phases with recourse to the mitigation measures for all adverse impacts.
- Detailed plans for highway-side tree plantation (as part of the compensatory afforestation component).
- Environmental enhancement measure would be incorporated.
- Enhancement measures would include items described in the scope of work and shall be complete with plans, designs, BOQ and technical specifications.
- Environmental monitoring plans during and after construction including scaling and measurement techniques for the performance indicators selected for monitoring.
- The EMP should be amendable to be included in the contract documents for the works.
- Incorporating any other as per the suggestions of the ADB/ World Bank/ <Agency>, till the acceptance of the reports by the ADB/ World Bank /<Agency> as applicable.

4.13.5Reporting requirements of RAP

Analysis on the resettlement plan be conducted based on ADBs Hand Book on Resettlement, A Guide to Good practice 1998 as amended time to time/ World Bank Guidelines / Government of India Guidelines, as applicable.

- Executive summary
- Description of project
- Objectives of the project.
- The need for Resettlement in the Project and evaluation of measures to minimize resettlement.
- Description and results of public consultation and plans for continued participation of PAPs.
- Definition of PAPs and the eligibility criteria.
- Census and survey results- number affected, how are they affected and what impacts will they experience.
- Legal and entitlement policy framework- support principles for different categories of impact.

- Arrangements for monitoring and evaluation (internal and external)
- Implementation schedule for resettlement which is linked to the civil works contract
- A matrix of scheduled activities linked to land acquisition procedures to indicate clearly what steps and actions will be taken at different stages and the time frame
- The payment of compensation and resettlement during the acquisition process
- An itemized budget (replacement value for all assets) and unit costs for different assets

5.1 Land Acquisition

5.1.1 Overall program management of all activities pertaining to Land Acquisition

5.1.1.1 Coordinate all activities necessary for accurate and timely publication of notifications as per NH Act including but not limited to

i. Identify all land parcels that need to be acquired as part of project highway

ii. Conduct Joint Measurement Survey in conjunction with CALA, <Agency> and state revenue department to verify land records

iii. Conduct valuation of land and associated assets (structures, trees, crops etc.) and liaison with authorities of State Government for authentication of the valuation

5.1.1.2 Liaison with relevant state departments throughout land acquisition process

i. Liaison with State Government departments including but not limited to Land Revenue Office (or Tehsil), Sub - Registrar office, Directorate of Surveys and with other State departments (like Public works department, horticulture department etc.) to expedite the land acquisition process

ii. Co-ordinate collection of all the necessary land record documents and information required to support CALA/CALA staff during the LA process

5.1.1.3 Facilitate communication between <Agency> (PIU) and CALA throughout land acquisition process

i. Ensure prompt official communication (including delivery of documents and notifications) between the office of Competent Authority for Land Acquisition (CALA) and <Agency>

5.1.1.4 Support CALA and PIU with manpower and resources CALA throughout land acquisition process

i. Ensure presence of adequate manpower like surveyors, revenue inspectors, assistants, peons, computer operators as required to support CALA, PIU, RO in the LA process corresponding to respective project

ii. Ensure comprehensive quality checks (4 Eye Checks) for all the notifications prepared before submission in the Bhoomi Rashi portal

5.1.2 Assist CALA and <Agency> (PIU) in the publication of notifications

5.1.2.1 Provide copy of following documents to PIU - 1 soft copy (less than 3MB combined) + 1 hard copy, on finalization of alignment and approval of the alignment from the competent authority

i. Index Map: Document showing alignment of proposed highway overlaid on a detailed political map of the region

ii. Alignment plan: Engineering plan detailing relative position of Proposed Right of Way to existing road, bypasses, realignments significant structures, affected villages and chainage

iii. **<Agency>** project sanction document detailing chainage, length, scheme code and land acquisition requirements (Total Land Required, Land available, land to be acquired etc.)

5.1.2.2 Conduct enquiry at Village Administrative Office along approved alignment to ensure inclusion of all villages

5.1.2.3 Ensure correct spelling of taluks and villages according to local revenue records (Jamabandi) or State Government land record website. The same should be done for English and Hindi

5.1.2.4 Obtain approval of taluk names, village names and other details mentioned in 3a from CALA office

5.1.2.5 Co-ordinate with PIU and District Collector/State Government in obtaining appointment order for CALA

5.1.2.6 Co-ordinate with NIC to ensure correct village names and spelling are included in Bhoomi Rashi portal

5.1.2.7 Assist PIU in creating 3a notification and preamble on Bhoomi Rashi along with all supporting documents in format prescribed to be sent for approval to <Agency> HQ

5.1.3 Assist CALA and <Agency> (PIU) in the publication of 3A notification

5.1.3.1 Co-ordinate collection of all village maps from state land revenue department

i. Ensure all village maps are collected from the Taluk Office/Regional Deputy Director of Survey and Land Records and bear a saleable copy mark.

5.1.3.2 Co-ordinate collection of all survey maps for all the affected survey numbers in the proposed right of way from state land revenue department

i. Ensure collection of digitized survey maps from the state revenue department prepared using CollabLand software of NIC for the purposes of land acquisition activities, wherever available

ii. Ensure all survey maps collected are scaled to 1:500, 1:1000 or 1:2000

iii. Ensure survey maps contain all necessary information including boundary dimensions, ladder diagrams, topographical details, sub division details and adjoining survey numbers as available, in line with the norms of the State Government

iv. Verify the level of accuracy in the maps and their suitability for the purposes of supporting the land acquisition effort for the project road in terms of both dimensional accuracy and details available

v. Ensure consistency between the revenue maps and other land records (Record of Rights, Tenancy and Crops /A-Register etc.) and correct the maps/records in case of inconsistency. Ensure, the corrected maps are vetted by the Village Administrative Officer

5.1.3.3 Ensure collection of geo referenced control points capable of being imported into appropriate GIS system

i. Conduct an alignment walk-through and ensure details of the ground control points include village stones, suitable land details and permanent geographical features are collected

ii. Ensure a minimum of 10 control points are identified and geo-referenced for every 1 km

iii. Ensure the Geo-location information from the control points are imported into the GIS system, to aid in superimposition of alignment map and the digitized village map. Suitable land details and features should also be added to the GIS system to enable review of individual land parcels.

5.1.3.4 Ensure accurate digitization and projection of village maps on GIS system

i. Consultant should ensure complete digitization of the area containing the Proposed Right of Way

ii. Where digitized revenue maps are unavailable or are deemed to be insufficient for the purposes of this project, the consultant shall digitize the survey maps of the area falling in and surrounding the existing and PROW, keeping the following in mind:

1. Create digitized maps of individual survey numbers using the procedure used by the land revenue department to recreate revenue maps such as using ladder diagrams, grid dimensions etc., using CollabLand software, wherever possible
2. Input numerical measurements mentioned in the ladder diagram/grid dimensions/survey boundaries in CollabLand or similar software to ensure accuracy of digital map
3. Stitch the digitized survey maps to recreate a scaled and digitized village map depicting all the survey numbers affected by the proposed right of way

iii. Ensure that the digitized map exactly matches the original map like a contact print and contain all information contained in the original survey map

iv. Ensure an accuracy of 1mm or higher in a 1:1000 scale, as this translates into an accuracy of 1 m or higher on ground

v. In digitization and feature addition, the consultant shall endeavor to follow any standards, requirements and formats laid down by the relevant state/ central government agency for land ownership and revenue management or that set by the authority involved in digitization of land records

1. Where applicable, the consultant shall share back the digitized cadastral maps in both soft and hard copy with the relevant local agency or state government

5.1.3.5 Ensure accurate projection of survey revenue maps on Google Earth or similar GIS software necessarily having the following layers

i. Alignment Map

ii. Digitized Village Map

iii. Topographical details as collected during topographical survey using LiDAR/. Imaging

iv. Geo-referenced control points imported into GIS software

5.1.3.6 Ensure proper superimposition of the alignment map, digitized village map by accurately matching the topographical details and geo-referenced ground control points on both the layers.

i. Divide the village maps at every 500 meters (in case of the same village) to ensure proper projection of the planar map on Google Earth or equivalent

ii. Adjust the digitized map to exactly match the ground situation using the geo-referenced ground control points identified

5.1.3.7 Accurately identify extent of area encroached by alignment in survey numbers/sub division numbers using appropriate software (ArcGIS/AutoCAD, etc) based on the superimposition of the alignment map on the digitized village map

5.1.3.8 Co-ordinate collection all the relevant revenue records from state revenue department required to ascertain type and nature of land

i. Collect the updated land revenue records with details on survey numbers, sub-division, land type, land nature and owner from the Taluk office

5.1.3.9 Prepare and submit 3A draft and LA plan in the format prescribed by <Agency>

5.1.3.10 Co-ordinate submission of copies of LA plan and Alignment map to CALA offices through PIU required for verification of 3A draft in the format prescribed by the CALA Office

5.1.3.11 Facilitate CALA staff in verification of the draft 3A document

5.1.3.12 Assist CALA staff in preparation of 3A notification, preamble and forwarding letter to be forwarded to PIU

5.1.3.13 Assist PIU in uploading 3A notification (as declared by CALA) along with preamble on Bhoomi Rashi

i. Provide computer operators to upload 3A notification on Bhoomi Rashi

ii. Ensure the 3A submitted on Bhoomi Rashi matches the signed copy verbatim and no changes are made

5.1.3.14 Provide copy of 3A Gazette notification to the office of the CALA on publication in the Gazette

5.1.3.15 Prepare 3A notification in vernacular language to be sent to newspaper for 3A(3) notification

i. Ensure the translated 3A sent to the newspaper matches the 3A Gazette copy verbatim and no changes are made

5.1.3.16 Co-ordinate with the CALA to get a signed copy of the press ready version along with the file reference number needed for future reference at the CALA office

5.1.3.17 Assist PIU in coordinating with newspaper agency to ensure publication of 3A notification in 2 newspapers: 1 Vernacular + 1 Other

5.1.3.18 Provide copies of newspaper publication of 3A notification to the CALA and PIU

5.1.3.19 Ensure all activities are planned and adequate manpower is made available to ensure the prescribed timelines are adhered to

i. Ensure submission of 3A to the PIU in prescribed format within 30 days of 3a publication

ii. Ensure publishing of 3A in Gazette by pursuing the same with relevant stakeholder within 14 days of submission of final 3A to the PIU

iii. Provide adequate manpower including but not limited to AutoCAD draftsmen, liaison officers, computer operators, retired tahsildars, etc. to ensure mandated timelines are met

iv. Ensure adequate resources including but not limited to computers, software licenses, scanner, printer etc. are deployed to ensure mandated timelines are met

5.1.4 Assist CALA and <Agency> (PIU) in conduction of 3C enquiry and compilation of final orders

5.1.4.1 Co-ordinate with CALA for scheduling public hearings as necessitated by section 3C of NH Act 1956

5.1.4.2 Assist CALA staff in sending notices to petitioners on respective hearing dates either through newspaper notifications to be published in 2 newspapers: 1 Vernacular + 1 other or through respective village administrative offices

5.1.4.3 Provide copies of newspaper publication/ notices of 3C notification to the office of the CALA

5.1.4.4 Assist CALA staff in receiving and compiling of objections

5.1.4.5 Assist CALA during objection hearings, recording of hearings, ensuring compliance of corresponding orders and notification of final CALA order to petitioners

5.1.4.6 Assist CALA staff in dispatching and ensuring delivery of final 3C orders to petitioners in a timely manner and obtain acknowledgement of receipt of 3C orders from the aggrieved parties

5.1.5 Assist CALA and <Agency> (PIU) in conducting Joint Measurement Survey

5.1.5.1 Co-ordinate with the CALA office and state government departments and obtain all permissions necessary to conduct JMS and center line marking

5.1.5.2 Ensure laying of boundary pillars in an accurate and expedited manner

i. Ensure use of Differential GPS or Total Station systems to conduct center line marking

ii. Ensure placing of boundary pillars (left and right) and the center line peg (in case of brownfield sections), center line pillar (in case of greenfield sections) at 50-meter intervals, clearly demarcating the Proposed Right of Way.

iii. Ensure all boundary pillars are provided and planted as per IRC:25:1967

iv. Ensure that the boundary stones are secured at location

v. Provide daily reports to PIU and CALA office by mail indicating progress of boundary stone marking in terms of length and chainage covered

vi. Retain a Total Station system, controller and a prism holder for the entire duration of the JMS to ensure prompt assistance to the survey team

5.1.5.3 Ensure accurate and timely conduction of JMS for the complete length of the project

i. Provide scaled revenue maps, latest ownership records, village map and other revenue documents necessary for conducting JMS

ii. Arrange retired revenue sub inspectors of survey and chainmen to conduct Joint Measurement Survey at the consultant's cost

iii. Ensure accurate measurement of revenue survey plots with respect to PROW of project, by identifying physical features present on the ground & the survey sketches, measuring the distance of the PROW stone from the physical features and marking the distance on the survey sketch

iv. Ensure marking of PROW on scaled revenue maps indicating extent of encroachment into survey numbers/sub division numbers

v. Ensure surveyors collect details of structures and trees present in sub-divisions during JMS

vi. Ensure accurate calculation of area affected in each sub-division

vii. Ensure sub-division records are prepared as per the guidelines of the state revenue surveyor clearly indicating the name of the land owner as per latest ownership record

viii. Ensure sub-division records divide affected sub-divisions clearly indicating portion of land vested with the owner and portion of land acquired by <Agency>

ix. Ensure submission of JMS records in format expected by the CALA office along with all supporting documents

x. Co-ordinate with local land revenue office in updating of all land records as per sub-division records submitted to CALA office, including vesting of acquired land in the name of Government of India, post publication of the 3D notification

xi. Provide daily reports to PIU and CALA office by mail indicating progress of JMS in terms of length, villages and number survey numbers covered

5.1.5.4 Assist land revenue department in conducting pre-scrutiny

i. Ensure all records are submitted at Taluk office in the correct format

ii. Facilitate creation of new sub-divisions based on the sub division records submitted by the survey team, including vesting of acquired land in the name of Government of India, post publication of the 3D notification

iii. Provide daily reports to PIU and CALA office by mail indicating progress of pre-scrutiny in terms of number of villages covered

5.1.5.5 Co-ordinate with CALA team and PIU to facilitate site inspection

5.1.6 Assist CALA and <Agency> (PIU) in the publication of 3D notification

5.1.6.1 Prepare 3D draft based on 3A notification and scrutinized JMS statements in the format prescribed by <Agency>

5.1.6.2 Co-ordinate submission of copies of 3D draft and scrutinized JMS Statements to the office of the CALA for verification

5.1.6.3 Facilitate CALA staff in verification of the draft 3D version

i. Ensure presence of surveyors to clarify/rectify any issue that may arise during verification, both during on-ground inspection as well as during the document verification

5.1.6.4 Assist CALA staff in preparation of 3D notification, preamble and forwarding letter to be forwarded to PIU

5.1.6.5 Assist PIU in uploading 3D notification (as declared by CALA) along with preamble on Bhoomirashi

i. Provide computer operators to upload 3D notification on Bhoomirashi

ii. Ensure the 3D submitted on Bhoomirashi matches the signed copy verbatim and no changes are made

5.1.6.6 Provide copy of 3D Gazette notification to the office of the CALA on publication in the Gazette

5.1.6.7 Prepare 3D notification in vernacular language to be sent to newspaper

i. Ensure the translated 3D sent to the newspaper matches the 3D Gazette copy verbatim and no changes are made

5.1.6.8 Co-ordinate with the CALA to get a signed copy of the press ready version along with the file reference number needed for future reference at the CALA office

5.1.6.9 Assist PIU in coordinating with newspaper agency to ensure publication of 3A notification in 2 newspapers: 1 Vernacular + 1 Other

5.1.6.10 Provide copies of newspaper publication of 3D notification to the CALA and PIU

5.1.6.11 Ensure all activities are planned and adequate manpower is made available to ensure the prescribed timelines are adhered to

i. Ensure submission of 3D statement along with sub-division records to the PIU in prescribed format within 45 days of 3A publication

ii. Ensure publishing of 3D in Gazette by pursuing the same with relevant stakeholder within 15 days of submission of final 3D to the PIU

iii. Provide adequate manpower including but not limited to surveyors, revenue inspectors, chain-men, liaison officers, computer operators, central line marking teams, helpers, etc. to ensure mandated timelines are met

iv. Ensure adequate resources including but not limited to computers, boundary pillars, Total Station/DGPS systems, vehicles etc. are deployed to ensure mandated timelines are met

5.1.7 Assist the CALA in the declaration of award (3G)

5.1.7.1 Assist CALA in drafting public notice inviting claims (under sub-section 3 of section 3G) from all persons interested in the land tobe acquired and 3D notification to be published in 2 local newspaper - 1 vernacular and 1 other.

5.1.7.2 Co-ordinate with <Agency>/CALA on publishing of claim invitation notification in 2 local newspapers - 1 vernacular and 1 other. The public notice inviting claims (under sub-section 3 of section 3G) from all persons interested in the land to be acquired can be issued along with the newspaper publication of 3D notification

5.1.7.3 Provide 1 copy of newspaper notification of 3D and claim invitation to CALA, Ward, Panchayat, Circle office, police station and Collector office.

5.1.7.4 Assist CALA during claim hearings, record hearings and compliance of corresponding orders

i. Collate ownership claims and the documents received during the claim hearings

ii. Assist the office of the CALA in verifying the claims and in finalizing the land owners

5.1.7.5 Assist CALA office in collection of sales statistics and market value (Guideline value/ Collector rates) from the relevant State Government department

i. Collect the sales statistics for 3 years prior to the date of the 3A notification from the Sub-Registrar's Office

ii. Assess the sales statistics to evaluate the nature of land for all the sale deeds based on the land records available with the State Government (Chitta/ A- Register, etc.)

iii. Compute the average of the top 50% of the sales statistics after eliminating the outliers, with proper justification

iv. Collect the Guideline Value/ Prevalent market rates, as issued by the order of the Competent Authority of the State Government for all the relevant villages

v. Collect the details of the sales of land for public purpose through private negotiation in the recent past for similar type of land

5.1.7.6 Compute land valuation for the all the affected survey numbers in line with RFCTLARR Act and the guidelines issued by MoRTH

5.1.7.7 Conduct valuation of land related assets (Structures, trees, crops etc.) and liaison with respective State authority including but not limited to State Public Works Department, Agriculture, Horticulture, Forest Department, etc. for authentication of the valuation.

5.1.7.8 Assist CALA in 3G award preparation and in drafting 3G award documents along with the required Annexures including but not limited to preparation of field book which contains award by each beneficiary, list of sales statistics considered for finalizing the market value, etc.

5.1.8 Assist <Agency> in obtaining possession of land

5.1.8.1 Co-ordinate delivery of confirmation letter of deposit from PIU to CALA

5.1.8.2 Assist CALA staff in drafting notification for beneficiaries for award collection and vacating the land within 60 days (under section 3E)

5.1.8.3 Co-ordinate serving of notice to all beneficiaries for collection of award and to vacate the land within 60 days (under section 3E)

5.1.8.4 Co-ordinate collection of certificate of possession from CALA

5.1.8.5 Assist and liaison with competent authority for Land acquision in getting mutation of land done in the name of <Agency>. Also incorporate status of mutation of land in Monthly Progress Report (MPR).

5.1.9 Publication of Gazette Notifications relating to Land Acquisition:

5.1.9.1 Cost for publication of Gazette Notifications relating to land acquisition in Newspapers shall be borne by the <Agency>.

5.2 Utility shifting proposal and estimates

5.2.1 Identify type and location of all existing utilities within the proposed ROW

1. Consultant will review information available with all utilities agencies in the region, consult maps/plans available with <Agency>, MoRTH and state road agencies, consult with locals and municipal bodies to ascertain the presence and location of utilities , including but not limited to water-mains, gas, telephone, electricity and fiber-optic installations in and around the project road

2. Deploy ground penetrating radar, inductor locators or better technology to accurately map the location, type and size of utilities in the ROW of the project road as required in the section of this TOR

3. Develop a detailed strip plan and digitized maps showing:

    i. type, size and current location of all the utilities identified

    ii. relative offset from the centerline

    iii. existing right of way

5.2.2 Plan for utilities in future road design

1. Consultants need to identify utilities that will require shifting to enable construction of the proposed project road

2. Incorporate space required for elevated and under-ground utilities corridors and utilities crossings as required for existing and future utilities in consultation with user departments

5.2.3 Develop a utilities relocation plan

1. Consultants need to develop and submit a utilities relocation plan in consultation with <Agency> and user departments clearly identifying current utilities and suggested relocations along with crossings as required

2. Plan and conduct discussions, consultations and joint site visits required for the planning of utilities shifting and the development of required drawings and proposals

3. Prepare necessary details, documents and suggested relocation plan to be submitted to user department

4. Develop initial cost estimates based on suggested relocation plan and the latest available schedule of rates for inclusion in the cost of the project at the time of approval

5.2.4 Estimates and approvals

1. Consultants need to obtain draft utilities shifting proposal from user departments for all utilities identified for shifting along project road

2. Prepare utility shifting cost estimates using latest schedule of rates and obtain approval from user departments

3. Review final designs submitted, cost estimates, complete checklist, obtain required declarations and submit to <Agency> for approval

4. Work with user department, <Agency> as required to incorporate any changes requested in shifting proposal and cost estimate

5. Obtain all required utilities shifting proposal estimates and required approvals from both user departments and <Agency>within the time stipulated in DPR contract

5.3 Estimation of Quantities and Project Costs

1. The Consultants shall prepare detailed estimates for quantities (considering designs and mass haul diagram) and project cost for the entire project (civil packages wise), including the cost of environmental and social safeguards proposed based on MoRT&H's Standard Data Book and market rate for the inputs. The estimation of quantities shall be based on detailed design of variouscomponents of the projects. The estimation of quantities and costs would have to be worked out separately for civil work Package as defined in this TOR.

2. The Consultants shall make detailed analysis for computing the unit rates for the different items of works. The unit rate analysis shall duly take into account the various inputs and their basic rates, suggested location of plants and respective lead distances for mechanized construction. The unit rate for each item of works shall be worked out in terms of manpower, machinery and materials.

3. The project cost estimates so prepared for <Agency>/ADB/WB projects are to be checked against rates for similar on-going works in India under <Agency>/WorldBank/ ADB financed road sector projects.

4. The Consultant should work out the quantity of Bitumen, Steel and Cement likely to be used in the project and indicate in the summary sheet.

5. The consultant shall furnish cost comparison amongst conventional and with the use of New/alternative Material and Technology to arrive at the estimated cost. The estimated cost as proposed by the consultant shall be cost effective as well as environment friendly.

6. Viability and Financing Options and Bidding process

1. The Project Road should be divided into the traffic homogenous links based on the findings of the traffic studies. The homogenous links of the Project Road should be further subdivided into sections based on physical features of road and pavement, sub-grade and drainage characteristics etc. The economic and commercial analysis shall be carried out separately for each traffic homogenous link as well as for the Project Road.

2. The values of input parametres and the rationale for their selection for the economic and commercial analyses shall be clearly brought out and got approved by <Agency>.

3. For models to be used for the economic and the commercial analyses, the calibration methodology and the basic parametres adapted to the local conditions shall be clearly brought out and got approved by <Agency>.

4. The economic and commercial analyses should bring out the priority of the different homogenous links in terms of project implementation.

6.1. Economic Analysis

1. The Consultants shall carry out economic analysis for the project. The analysis should be for each of the sections covered under this TOR. The benefit and cost streams should be worked out for the project using HDM-IV or other internationally recognized life-cycle costing model.

2. The economic analysis shall cover but be not limited to be following aspects:

   i. assess the capacity of existing roads and the effects of capacity constraints on vehicle operating costs (VOC);

   ii. calculate VOCs for the existing road situation and those for the project;

   iii. quantify all economic benefits, including those from reduced congestion, travel distance, road maintenance cost savings and reduced incidence of road accidents; and,

   iv. estimate the economic internal rate of return (EIRR) for the project over a30-year period. In calculating the EIRRs, identify the tradable and non- tradable components of projects costs and the border price value of the tradable components.

   v. Saving in time value.

3. Economic Internal Rate of Return (EIRR) and Net Present Value (NPV), "with "and "without time and accident savings" should be worked out based on these cost-benefit stream. Furthermore, sensitivity of EIRR and NPV worked out forth different scenarios as given under:

   Scenario – I Base Costs and Base Benefits

   Scenario - II Base Costs plus 15% and Base Benefits

   Scenario - III Base Costs and Base Benefits minus 15%

   Scenario – IV Base Costs plus 15% and Base Benefits minus 15%

   The sensitivity scenarios given above are only indicative. The Consultants shall select the sensitivity scenarios taking into account possible construction delays, construction costs overrun, traffic volume, revenue shortfalls, operating costs, exchange rate variations, convertibility of foreign exchange, interestrate volatility, non-compliance or default by contractors, political risks and force majeure.

4. The economic analysis shall take into account all on-going and future road and transport infrastructure projects and future development plans in the project area.

6.2 Financial Analysis

6.2.1 Need for financial analysis

1. It is envisaged that project stretches should be implemented in a commercial, PPP funded format

2. Therefore, the Consultant will need to study the financial viability of the project under various available commercial formats and suggest a mode of funding and execution that is most likely to be successful

3. The consultant shall study the financial viability of the project under several different traffic volume, user fee scenarios and funding options to arrive at the optimal execution mode and funding modalities

6.2.2 Financial analysis of the project

1. The Consultants shall in consultation with <Agency> finalize the format for the analysis and the primary parameters and scenarios that should be taken into account while carrying out the commercial analysis

2. The Financial analysis for the project should cover financial internal rate of return, projected income statements, balance sheets and fund flow statements and should bring out all relevant assumptions.

3. The financial analysis should cover identification, assessment, and mitigating measures for all risks associated with the project. The analysis shall cover, but be not limited to, risks related to construction delays, construction costs overrun, traffic volume, revenue shortfalls, operating costs, exchange rate variations, convertibility of foreign exchange, interest rate volatility, non-compliance or default by contractors, political risks and force majeure.

4. The sensitivity analysis should be carried out for a number of probabilistic scenarios.

6.2.3 Outputs from financial analysis

1. The financial model so developed shall be handed over to and be the property of <Agency>.

2. The consultant shall also suggest positive ways of enhancing the project viability and furnish different financial models for implementing on BOT format

6.3 Bidding process

6.3.1 Consultant shall assist the authority in preparing the required bid documents and support the authority through the bidding process

6.3.2 Preparation of documents

1. The consultant shall prepare all required bid documents and technical schedules required for the bidding of the project

2. The Consultants shall prepare separate documents for each type of contract (EPC/PPP) for each package of the DPR assignment

3. The consultant shall assist authority in reviewing bid documents and in making any changes required basis their findings or the and finalising bid documents

4. The consultant shall assist the authority in collecting and providing all required supporting documents for initiating bid as defined by the SOP for contracting

5. The DPR consultant may be required to prepare the Bid Documents, based on the feasibility report, due to exigency of the project for execution if desired by <Agency>.

    a. To enable this, consultant should study the financial viability and financial options for the project for modes such as BOT Toll/Annuity during the feasibility stage.

6. Provide any and all clarifications required by the authority or other functionaries such as the financial consultant and legal advisor as required for the financial appraisal and legal scrutiny of the Project Highway and Bid Documents.

7. The consultant shall be guided in its assignment by the Model Concession/ Contract Agreements for PPP/ EPC projects, as applicable and the Manual of Specifications and Standards for two/ four/ six laning of highways published by IRC (IRC:SP:73 or IRC:SP:84 or IRC:SP:87, as applicable) along with relevant IRC codes for design of long bridges.

a. It is suggested that consultant should go through the EPC/PPP documents of ministry before bidding the project.

6.3.3 Support during the bidding process

1. Consultant shall support <Agency> through the entire bid process and shall be responsible for sharing the findings from the preparation stages during the bid process.

2. The consultant shall ensure participation of senior team members of the consultant during all interaction with potential bidders including pre-bid conference, meetings, site visits etc.

3. During the bid process for a project, the consultant shall support the authority in:

   a. Responding to all pre-bid technical queries

   b. Preparation of detailed responses to the written queries raised by the bidders

4. The consultant shall assist <Agency> and its functionaries as needed in the evaluation of technical bids

7. Time period for the service

1. Time period envisaged for the study of the project is indicated in **Annexure-I to LOI.** The final reports, drawings and documentation shall be completed within this time schedule.

2. <Agency> shall arrange to give approval on all sketches, drawings, reports and recommendations and other matters and proposals submitted for decision by the Consultant in such reasonable time so as not to delay or disrupt the performance of the Consultant's services.

8. Project Team and Project Office of the Consultant

1. The Consultants shall be required to form a multi-disciplinary team for this assignment. The consultants' team shall be manned by adequate number of experts with relevant experience in the execution of similar detailed design assignments.

2. List of suggested key personnel to be fielded by the consultant with appropriate man-month of consultancy services is given in APPENDIX-IA (Part-I) as per client's assessment.

3. A Manning Schedule for key personnel mentioned above is enclosed as APPENDIX-IA (Part-I) along with broad job- description and qualification as APPENDIX-IB (Part-I). The information furnished in APPENDIX-I & II (Part-I) are to assist the Consultants to understand the client's perception about these requirements and shall be taken by the Consultants for the purpose of Financial Proposal and deployment schedule etc. in technical proposal to be submitted by them. Any deviation proposed may be recorded in the comments on TOR. **Key personnelsas mentioned in LOI will be evaluated at the time of evaluation of technical proposal**. Consultants are advised in their own interest to frame the technical proposal in an objective manner as far as possible so that these could be properly assessed in respect of points to be given as part of evaluation criteria as mentioned in Data sheet. The bio-data of the **required** key personnel should be signed on every sheet by the personnel concerned and the last sheet of each bio-data should also be signed by the authorized signatory of the Consultants.

4. The Consultants shall establish an office at the project site manned by senior personnel

during the course of the surveys and investigations. All the project related office work shall be carried out by the consultant in their site office unless there are special reasons for carrying out part of the office work elsewhere for which prior approval of <Agency> shall be obtained. The address of the site office including the personnel manning it including their Telephone and FAX numbers will be intimated by the Consultant to <Agency> before commencement of the services.

5. All key personnel and sub professional staff of the DPR Consultants shall use the fingerprint based (biometric) attendance system for marking their daily attendance. Attendance shall be marked at least once a day and anytime during the day. Biometric Attendance System shall be installed by the DPR Consultants at its own cost at the site office and design office in order to facilitate the attendance marking. A copy of attendance records shall be attached at the time of submission of their bills to the <Agency> from time to time. Proper justification shall be provided for cases of absence of key personnel/ sub-professional staff which do not have prior approval from Project Director of Concerned stretch. If <Agency> so desires, it shall facilitate electronic linking of the attendance system with the Central Monitoring System of <Agency>.

9. Reports to be submitted by the Consultant to <Agency>

9.1 All reports, documents and drawings are to be submitted separately for each of the traffic homogenous link of the Project Road. The analysis of data and the design proposals shall be based on the data derived from the primary surveys and investigations carried out during the period of assignment. The sources of data and model relationships used in the reports shall be indicated with complete details for easy reference.

9.2 Project preparation activities will be split into eight stages as brought out below.

No	Stage	Key activities	Report/deliverable submitted
1	Inception	Project planning and mobilization	Inception Report and QAP
2	Feasibility	Alignment finalization, preliminary surveys	Alignment Options Report and Feasibility Report
3	LA and Clearances I	LA, utilities identification; creation of draft notifications and proposals	Strip Plan, LA Report (3a, 3A), Clearances and Utility Shifting proposals
4	DPR	Detailed design of highway, preparation of detailed project report with drawings	Draft DPR Report, Final DPR Report, documents and drawings
5	Technical Schedules	Preparation of bid documents and technical schedules	Civil Works Contract Agreement and Schedules
6	(i) LA II (ii) Project Clearances	*Land acquisition process, obtaining final utilities estimates and required clearances*	JMS and *3D Report, Final Project Clearances and Utilities Report*
7	LA III- Award Determination	Land acquisition award determination	*3G Report*
8	LA IV- Possession	*Obtaining possession of land*	*Land Possession Report*

Preliminary design work should commence without waiting for feasibility study to be completed. Stage 3, 5 and 6 shall run in parallel with Stage 2 and 4

For stages 7 and 8 consultant will be required to submit a report at the completion of 90% of the activities for that stage. In addition, an updated report will need to be submitted at the completion of all land acquisition activities covering receipt of 100% of the land possession certificates for the land parcels pertaining to the project road.

9.3 Timelines for the submission of reports and documents

Consultant shall be required to complete, to the satisfaction of the client, all the different stages of study within the time frame indicated in the schedule of submission in para 10 pertaining to Reports and Documents for becoming eligible for payment for any part of the next stage.

10 Reports and Documents to be submitted by the Consultant to <Agency>

1. The Consultant shall submit to the client the reports and documents in bound volumes (and not spiral binding form) after completion of each stage of work as per the schedule and in the number of copies as given in Enclosure-I. Further, the reports shall also be submitted in floppy diskettes / CD's in addition to the hardcopies as mentioned in Enclosure-I. Consultant shall submit all other reports mentioned specifically in the preceding paras of the TOR.

2. The time schedule for various submissions prescribed at Sl. No.1 above shall be strictly adhered to. No time overrun in respect of these submissions will normally be permitted. Consultant is advised to go through the entire terms of reference carefully and plan his work method in such a manner that various activities followed by respective submissions as brought out at Sl.No.1 above are completed as stipulated. Consultant is, therefore, advised to deploy sufficient number of supporting personnel, both technical and administrative, to undertake the project preparation activities in construction package (Section) simultaneously. As far as possible, the proposal should include complete information such as number of such persons, name, position, period of engagement, remuneration rate etc. The Consultant is also advised to start necessary survey works from the beginning so as to gain time in respect of various other activities in that stage.

3. DPR Deliverables in each stage of project

1. The key stages, activities and deliverables for the detailed project report are as described in these documents

2. The following section describes the detailed requirements for each report that needs to be submitted

3. Consultants are also advised to refer to ENCLOSURE-II

4. Formats for submission of Reports and Documents to understand any additional format and content requirements

5. All reports must be submitted along with the relevant checklist form completed and signed off by the consultant

STAGE 1

10.1 Quality Assurance Plan (QAP) Document

1. Immediately upon the award, the Consultants shall submit four copies of the QAP document covering all aspects of field studies, investigations design and economic financial analysis. The quality assurance plans/procedures for different field studies, engineering surveys and investigation, design and documentation activities should be presented as separate sections like engineering surveys and investigations, traffic surveys, material geo-technical and sub-soil investigations, road and pavement investigations, investigation and design of bridges & structures, environment and R&R assessment, economic & financial analysis, drawings and documentation; preparation, checking, approval and filing of calculations, identification and traceability of project documents etc. Further, additional information as per format shall be furnished regarding the details of personnel who shall be responsible for carrying out/preparing and checking/verifying various activities forming part of feasibility study and project preparation, since inception to the completion of work. The field and design activities shall start after the QAP is approved by <Agency>.

2. Data formats for report and investigation result submission

   i. Required data formats for some reports, investigations and documents are discussed in ENCLOSURE-II

   ii. Formats for submission of Reports and Documents.

   iii. The consultants will need to propose data formats for use in all other field studies and investigations not covered in enclosure II.

   iv. The proposed data forms will need to be submitted for the approval of <Agency> after the commencement of services.

10.2 Inception Report (IR)

1. The report shall cover the following major aspects:

   i. Project appreciation;

   ii. Detailed methodology to meet the requirements of the TOR finalized in consultation with the <Agency> officers; including scheduling of various sub activities to be carried out for completion of various stages of the work; stating out clearly their approach & methodology for project preparation after due inspection of the entire project stretch and collection/ collation of necessary information;

   iii. Task Assignment and Manning Schedule;

   iv. Work programme;

   v. Proforma for data collection;

   vi. Design standards and proposed cross-sections;

   vii. Key plan and Linear Plan;

   viii. Development plans being implemented and/or proposed for implementation in the near future by the local bodies and the possible impact of such development plans on the overall scheme for field work and design for the study;

   ix. Quality Assurance Plan (QAP) finalized in consultation with <Agency>;

x. Draft design standards; and

2. The requirements, if any, for the construction of bypasses should be identified on the basis of data derived from reconnaissance and traffic studies. The available alignment options should be worked out on the basis of available maps. The most appropriate alignment option for bypasses should be identified on the basis of site conditions and techno-economic considerations. Inception Report should include the details regarding these aspects concerning the construction of bypasses for approval by <Agency>.

   i. Bypasses should be identified on the basis of data derived from reconnaissance and initial traffic information/traffic studies

   ii. The available alignment options should be worked out on the basis of available topographic maps, publicly available mapping services or remote sensing based topography and land use maps

   iii. The most appropriate alignment option for bypasses should be identified on the basis of site conditions and techno-economic considerations

10.3 Alignment options report

1. Basis review of the existing project road, local traffic patterns and initial reconnaissance surveys, the consultant shall present possible alignment alternatives for the project road

2. Alignment options should include but not be limited to:

   (i) Greenfield sections of the road

   (ii) New alignments due to lack of RoW, opportunity to shorten road etc.

   (iii) New/Re-alignment to cater to local traffic and o-d points

   (iv) Re-alignment due to changes in local network and/or surrounding road network

   (v) Bypasses as suggested and approved in alignment report

   (vi) Re-alignment due to need to improve road geometry

   (vii) Provision of ROBs, flyovers and other structures

3. The alignment report shall contain:

   i. Drivers for re-alignment of road and re-alignment needed as discussed in para 2 above

   ii. Alignment alternatives for each section where re-alignment of road is needed

   iii. Analysis of alignment alternatives bringing out the pros and cons of each alternative including, but not limited to: new construction required, land acquisition requirements, environmental impact, utilities and structures affected, cost of construction, road geometry and road safety aspects, input from local consultation, <Agency> views

   iv. Recommendations from among the alignment options presented for the authority to consider

      a. Consultant will enable authority to visualize and compare alignment options by providing alignment options in a GIS environment that should include, but not be limited to:

         i. Road alignment alternative centerlines

         ii. Digital elevation model of the region

         iii. Land use / land cover information

         iv. Hydrology information

         v. Surrounding road network including key NH, SH, MDR and ODRs

         vi. Key O/D points and urban settlements

         vii. High resolution satellite/airborne imagery of the region

10.4 Feasibility Report

1. The consultant shall commence the Feasibility Study of the project in accordance with the accepted IR and the report shall contain the following:

   i. Executive summary

   ii. Overview of <Agency> organization and activities,and project financing and cost

recovery mechanisms

iii. Project description including possible alternative alignments/bypasses and technical/engineering alternatives

iv. Methodology adopted for the feasibility study

v. Socio economic profile of the project areas

vi. Indicative design standards, methodologies and specifications

vii. Traffic surveys and analysis

viii. Environmental screening and preliminary environmental assessment

ix. Initial social assessment and preliminary land acquisition/resettlement plan

x. Cost estimates based on preliminary rate analysis and bill of quantities,

xi. Cost analysis of all alternate identifiedalignments

xii. Economic and financial analysis

xiii. Conclusions and recommendations

2. In view of para 1 above the consultant has to submit the following documents insix sets:

i. **Technical Specifications:** The MORT&H's Technical Specifications for Road and Bridge works shall be followed for this study. However, Volume-IV: Technical Specifications shall contain the special technical specifications which are not covered by MORT&H Specifications for Roads and Bridges (latest edition / revision) and also specific quality control norms for the construction of works.

ii. **Rate Analysis:** This volume will present the analysis of rates for all items of works. The details of unit rate of materials at source, carriage charges, any other applicable charges, labourrates, and machine charges as considered in arriving at unit rates will be included in this volume.

iii. **Cost Estimates:** This volume will present the each item of work as well as a summary of total cost.

iv. **Bill of Quantities:** This volume shall contain the detailed Bill of Quantities for all items of works

3. The basic data obtained from the field studies and investigations shall be submitted in a separate volume as an Appendix to Feasibility Report.

4. The Final Feasibility Study Report incorporating comments, revisions and modifications suggested by <Agency> shall be submitted within 15 days of receipt of comments from <Agency> on draft feasibility study report.

10.5 Strip Plan and Clearances

1. The Consultants shall submit the following documents:

   i. Details of the center line of the proposed widened NH along with the existing and proposed right-of-way limits to appreciate the requirements of land acquisition;

   ii. The information concerning the area including ownership of land to be acquired for the implementation of the project shall be collected from the revenue and other concerned authorities and presented along with the strip plans;

   iii. Strip plans showing the position of existing utilities and services indicating clearly the position of their relocation;

   iv. Details for various clearances such as environment and forest clearances;

   v. Separate strip plan showing shifting / relocation of each utility services in consultation with the concerned local authorities;

   vi. The utility relocation plans should clearly show existing right-of-way and pertinent topographic details including buildings, major trees, fences and other installations such as water-mains, telephone, telegraph and electricity poles, and suggest relocation of the services along with their crossings the highway at designated locations as required and prepare necessary details for submission tothe Service Departments;

   vii. Detail schedules for acquisition of additional landand additional properties in consultation with the revenue authorities; and

   viii. Land Acquisition Plan shall be prepared after digitization of cadastral/land revenue maps. The digitized map shall exactly match the original map, like a contact print, since the dimensions and area of plots, or the whole village is to be extracted from the map itself. An accuracy of 1mm or higher in a 1:1000 scale map shall be ensured, as this translates into an accuracy of 1 m or higher on ground.

2. The strip plans and land acquisition plan shall be prepared on the basis of data from reconnaissance and detailed topographic surveys.

3. The Report accompanying the strip plans should cover the essential aspects as given under:

   i. Kilometre-wise Land Acquisition Plan (LAP) and schedule of ownership thereof and Costs as per Revenue Authorities and also based on realistic rates.

   ii. Details of properties, such as buildings and structures falling within the right-of-way and costs of acquisition based on realistic rates.

   iii. Kilometre-wise Utility Relocation Plan (URP) and costs for relocation per civil construction package as per concerned authorities.

   iv. Kilometre-wise account in regard to felling of trees of different type and girth and value estimate of such trees based on realistic rates obtainable from concerned District forest office.

4. The strip plans shall clearly indicate the scheme for widening. The views and suggestions of the concerned State PWDs should be duly taken into account while working out the widening scheme (left, right or symmetrical). The widening scheme shall be finalized in consultation with <Agency>.

5. Kilometre-wise Strip Plans for section (Package) shall be prepared separately for each concerned agency and suggested by <Agency>.

10.6 Land Acquisition Report

1. Consultant shall submit a detailed land acquisition plan that provides details on kilometre-wise land acquisition requirements, all required details and draft notifications made.

2. The Land acquisition plan and report shall be prepared and submitted for each section (package). Details shall also be submitted in land acquisition proforma to be supplied by <Agency>, in both Hindi and English languages.

3. The Land Acquisition Plan shall be prepared after digitization of cadastral/land revenue maps as per clause of this TOR

    i. Land parcels identification should be verified by superimposing the proposed road corridor RoW on the geo-located cadastral map to ensure all affected land parcels have been accounted for and land area to be acquired is accurately determined

4. The land acquisition plan shall present details concerning the land area to be acquired in conjunction with the strip plan:

    i. Kilometer-wise existing and proposed RoW on either side of the proposed centreline

    ii. Detail schedules of additional land to be acquired, land ownership and other required details as per revenue records

    iii. Details of properties, such as buildings and structures falling within the right-of way

    iv. Costs of acquisition as per revenue authorities and also based on realistic market derived rates

    v. Detail schedules for acquisition of additional land and additional properties in consultation with the revenue authorities;

5. The land acquisition plan shall report the progress of the land acquisition process under the NH Land Acquisition act

    i. All required details on land parcels to be acquired

    ii. Copies draft 3a and 3A notifications and approvals from <Agency>

    iii. Copies of published notifications, communication with CALAs and current status land acquisition process

    iv. Village, district and CALA wise summary of land to be acquired, current status of process and notifications published

6. The estimated cost of land acquisition shall invariably be worked out realistically for all projects before finalization of 3(D) notifications for publication so as enable taking a conscious decision regarding the feasibility of acquiring the land or exploring of other alternatives (such as following alternative alignments, etc.).

7. The land acquisition report should be prepared in consultation with affected persons, non-governmental organisations and concerned government agencies and should cover land acquisition and resettlement plan and estimated costs of resettlement and rehabilitation of affected persons.

10.7 Utility relocation plan

1. The consultant shall prepare a kilometre-wise Utility Relocation Plan (URP) and costs for relocation per civil construction package as per estimates from concerned authorities

2. The utility relocation shall contain details regarding:

    i. All utilities identified in the existing and proposed road RoW such as water-mains, telephone, telegraph and electricity poles

    ii. Those utilities that will require shifting to enable construction of the project road

    iii. All necessary details required for submission of utilities shifting proposals to the concerned user agencies

    iv. Copies of utilities shifting proposals made to the concerned user agencies along with suggested relocation of services along with their crossings across the project road at designated locations as required

    v. Details of consultations made with local people and user agencies

    vi. Preliminary scheme for shifting and cost estimates for shifting as per the concerned authorities

    vii. Separate strip plan showing shifting/relocation of each utility services prepared in consultation with the concerned local authorities

    viii. Draft map and plans showing road centerline, existing right of way, proposed right of way, pertinent topographic details and existing and proposed location of utilities

10.8 Clearances report

1. The consultant shall prepare a report regarding all other clearances required to enable the construction of the project road such as environment, forest, tree cutting and railways clearances

2. The clearances report shall include kilometre-wise requirement of all clearances required presented along with the strip plan including, but not limited to:

    i. Requirements for environmental clearances along the project corridor

    ii. Requirements for forest clearances including type of forest affected, extent of land area needing diversion

    iii. Account of required felling of trees of different type and girth and value estimate of such trees based on realistic rates obtainable from concerned District forest office

    iv. Plan of compensating afforestation, its land requirement with specific locations and cost involved for undertaking all activities in this regard.

    v. Requirements for wildlife clearances

    vi. Requirements for CRZ clearances

    vii. ROB/RUBs along the project corridor to be constructed, widened or modified in any form requiring clearances from the railways

    viii. Clearances from Irrigation Authorities regarding Irrigation structures, etc.

3. The clearances report shall also include:

    i. Details of proposals made to concerned agencies and departments

ii. Date of submission of clearances proposals, Environmental impact assessment report to the competent authority

iii. Copies of all actual clearance proposals made or drafts of proposals yet to be submitted

iv. Information regarding points of contact, current status of proposals made, key issues raised and clear next steps to obtaining clearances

4. The consultant shall also assist in attending to queries raised/ furnishing of clarifications towards securing applicable clearances.

STAGE: 4

10.9 Draft Detailed Project Report (DPR)

1. The draft DPR Submission shall consist of construction package-wise Main Report, Design Report, Materials Report, Engineering Report, Drainage Design Report, Economic and Financial Analysis Report, Environmental Assessment Report including Resettlement Action Plan (RAP), Package-wise bid Documents and Drawings.

2. The Report volumes shall be submitted as tabulated in para 10 above.

3. The Documents and Drawings shall be submitted for the Package and shall be in the following format:

Reports

i. **Volume-I, Main Report:** This report will present the project background, social analysis of the project, details of surveys and investigations carried out, analysis and interpretation of survey and investigation data, traffic studies and demand forecasts designs, cost estimation, environmental aspects, economic and commercial analyses and conclusions. The report shall include Executive Summary giving brief accounts of the findings of the study and recommendations. A sample executive summary has been enclosed in Appendix VIII.

The Report shall also include maps, charts and diagrams showing locations and details of existing features and the essential features of improvement and upgrading. The Environmental Impact Assessment (EIA) Report for contract package shall be submitted as a part of the main report.

The basic data obtained from the field studies and investigations and input data used for the preliminary design shall be submitted in a separate volume as an Appendix to Main Report.

ii. **Volume - II, Design Report:** This volume shall contain design calculations, supported by computer printout of calculations wherever applicable. The Report shall clearly bring out the various features of design standards adopted for the study. The design report will be in two parts. Part-I shall primarily deal with the design of road features and pavement composition while Part-II shall deal with the design of bridges, tunnels and cross-drainage structures. The sub-soil exploration report including the complete details of boring done, analyses and interpretation of data and the selection of design parametres shall be included as an Appendix to the Design Report.

The detailed design for all features should be carried out as per the requirements of the Design Standards for the project. However, there may be situations wherein it has not been possible to strictly adhere to the design standards due to the existing siteconditions, restrictions and other considerations. The report should clearly bring outthe details of these aspect and the standards adopted.

iii. **Volume - III, Materials Report:** The Materials Report shall contain details concerning the proposed borrow areas and quarries for construction materials and possible sources of water for construction purposes. The report shall include details on locations of borrow areas and quarries shown on maps and charts and also the estimated quantities with mass haul diagram including possible end use with leads involved, the details of sampling and testing carried out and results in the form of important index values with possible end use thereof.

The materials Report shall also includedetails of sampling, testing and test results obtained in respect physical properties of subgrade soils. The information shall be presented in tabular as well as in graphical representations and schematic diagrams. The Report shall present soil profiles along the alignment.

The material Report should also clearly indicate the locations of areas with problematic soils. Recommendations concerning the improvement of such soils for use in the proposed construction works, such as stabilization (cement, lime, mechanical) should be included in the Report.

iv. **Volume - IV, Environmental Assessment Report including Environmental Management Plan (EMP) & Resettlement Action Plan (RAP):** The Report shall be prepared conforming to the Guidelines of the Government of India, State Government and World Bank / ADB as appropriate for construction package.

v. **Volume-V, Technical Specifications:** The MORT&H's Technical Specifications for Road and Bridge works shall be followed for this study. However, Volume IV: Technical Specifications shall contain the special technical specifications which are not covered by MOST Specifications for Roads and Bridges (latest edition / revision) and also specific quality control norms for the construction of works.

vi. **Volume - VI, Rate Analysis:** This volume will present the analysis of rates for all itemsof works. The details of unit rate of materials at source, carriage charges, any other applicable charges, labour rates, machine charges as considered in arriving at unit rates will be included in this volume.

vii. **Volume - VII, Cost Estimates:** This volume will present the contract package wise cost of each item of work as well as a summary of total cost.

viii. **Volume - VIII, Bill of Quantities:** This volume shall contain the package-wise detailed Bill of Quantities for all items of works.

ix. **Volume - IX, Drawing Volume:** All drawings forming part of this volume shall be 'good for construction' drawings. All plan and profile drawings will be prepared inscale 1:250V and 1:2500H scale to cover one km in one sheet. In addition this volume will contain 'good for construction' drawings for the following:

- Horizontal Alignment and Longitudinal Profile.
- Cross-section @ 50m interval along the alignment within ROW
- Typical Cross-Sections with details of pavement structure.
- Detailed Working Drawings for individual Culverts and Cross Drainage Structures.
- Detailed Working Drawings for individual Bridges, tunnels and Structures.
- Detailed Drawings for Improvement of At-Grade and Grade-Separated
- Intersections and Interchanges.
- Drawings for Road Sign, Markings, Toll Plazas, and other Facilities.
- Schematic Diagrams (linear chart) indicating but be not limited to be following:
- Widening scheme;
- Locations of median openings, intersections, interchanges, underpasses, overpasses, bypasses;

- Locations of service roads;
- Location of traffic signals, traffic signs, road markings, safety features; and,
- Locations of toll plaza, parking areas, weighing stations, bus bays, rest areas, if any.
- Drawings for toll plaza, Bus Bays, Parking areas, Rest areas, weighing stations etc. All drawings will be prepared in A2 size sheets. The format for plan, crosssection and profile drawings shall be finalized in consultation with the concerned <Agency> officers. The drawings shall also include details of all BM and reference pillars, HIP and VIP. The co-ordinates of all points should be referenced to a common datum, preferably GTS referencing system. The drawings shall also include the locations of all traffic safety features including traffic signals, signs, markings, crash barriers, delineators and rest areas, busbays, parking areas etc.
- The typical cross-section drawings should indicate the scheme for future widening of the carriageway. The proposed cross-sections of road segment passing through urban areas should indicate the provisions for pedestrian movements and suitable measures for surface and sub-surface drainage and lighting, as required.
- Digital drawings of proposed highway and features

b. The consultant shall deliver the final road alignment geometry, proposed road way model and all proposed structures in a 3D engineered model with all the required features as proposed in Enclosure II

c. The consultant shall also provide digital versions of all drawings stated in para 1 above in the format proposed in Enclosure II

4. The draft Detailed Project report of specialized projects will be scrutinized by the Peer Review consultant appointed by <Agency>. The peer Review Consultant will be retired professional in the field, drawn from the various Central/State Highway/Road Work departments having adequate knowledge in the field. One professional will be earmarked from the standing panel of Peer Review consultant approved by <Agency> for each DPR. The Peer Review consultant will scrutinize the draft DPR within 15 days of submission and the observations will be complied with and incorporated in the final DPR.

10.10 Final Detailed Project Report, Documents and Drawings (6 Sets)

1. The Final package-wise DPR consisting of Main Report, Design Report, Drainage Design Report and Materials Report, incorporating all revisions deemed relevant following receipt of the comments from <Agency> on the draft DPR shall be submitted as per the schedule given in Enclosure-I.

STAGE: 5

10.11 Bid documents and Technical Schedules

1. Bid documents

a. The consultant shall prepare bid documents for EPC, PPP or other modes of contracting as suggested by <Agency>

b. Individual bid documents will be submitted for each mode suggested and for each individual package or section identified for execution

c. Consultant shall assemble and provide all supporting documents from the DPR assignment that will be required for the bid, in the format required by the contracting SOP in force at the time of bidding or as maybe required by the authority

2. Technical Schedules

a. The consultant shall submit a Draft Contract/Concession Agreement derived from the Master Contract/Concession Agreement maintained by the authority with all required modifications and inclusions made with reference to the

b. The agreement submitted shall contain all required technical schedules updated with the pertinent project details and data required

c. Draft agreement and schedules shall be finalised in consultation with the authority and submitted for further processing and use with the contractor/concessionaire awarded the bid packages

STAGE: 6

10.12 LA & Clearances II Report

Land acquisition report II

1. The consultant shall prepare and submit a second report on Land Acquisition providing details of further land acquisition activity, relevant documentation and notifications until 3D and report the outcomes of the joint measurement survey

2. The land acquisition report shall contain:

   i. Current status of land acquisition at a village, district and CALA level

   ii. Dates and details of all land acquisition related notifications published, proceedings/hearings held and objections raised

   iii. Draft, final (as declared by CALA where applicable) and published 3a, 3A and 3D notifications

   iv. Date of joint measurement survey by village, key proceedings and outcomes

   v. Detailed schedule of information regarding land to be acquired with information on land area, land type, nature of land use, ownership status, and area to be acquired by survey number and list of structures by plot

   vi. The report shall also contain updated sketches of alignment, updated land parcels to be acquired

   vii. All relevant information in this report shall be verified by the consultant with the land revenue department, and CALA office

Clearances Report II

1. The consultant shall obtain all the necessary project related clearances such as environment, forest and wildlife clearance from MOEF, Railways in respect of ROB/ RUBs, Irrigation Deptt, CRZ clearances from concerned authorities, and any other concerned agencies by the end of this stage

2. The final approvals shall be obtained and submitted to <Agency> so that project implementation can begin straight away

3. The accompanying report on clearances shall include:

    i. An updated list of all clearances required, current status, expected completion date in case the clearance is pending, key issues and suggested next steps

    ii. Details of all public hearings, consultations and meetings conducted in the process of obtaining the required clearances

    iii. Date/details of proposals submitted and estimated date for issue of clearances

    iv. Date and details of all joint measurement and site inspection surveys completed

    v. Date of final approval of clearances if any

    vi. Copies of all clearances obtained

Utilities Report II

1. Consultant shall obtain final utility clearances from the relevant user agencies to enable shifting of the utilities from project road

2. A report shall be submitted on the final completion status and costs of utilities shifting along with other final clearances and land acquisition II report

3. The final utilities clearances report shall contain a summary view of utilities shifting: type and extent of utility, length of road affected, chainage, user agency, point of contact and approver at agency, date of approval at agency and <Agency>, shifting estimate, agency/super vision fees, executing agency – user agency or <Agency>

4. In addition, for each utility to be shifted, the report shall contain:

    i. Copies of actual approvals granted at user agency and <Agency>

    ii. Cost estimates and shifting plans approved, demand note from agency

    iii. Approved utilities shifting proposal including strip plan showing scheme of shifting

    iv. Map and design/engineering drawings of existing utility and shifting to be executed

    v. Details of approved contractors, schedule of rates for state and bank account/deposit details for agency

    vi. Finance pro-forma, utilities checklist, no upgradation certificate and other documentation as maybe required by <Agency> at the time of approval

Stage 7: Award Determination

10.13 Submission of Award Determination Report

a. Consultant shall submit a report on status of award upon approval by <Agency> of award declared for 90% of linear length as per LA plan or as per the timeline as given in Enclosure I, whichever is earlier

b. The Consultant shall also submit an updated report containing all required details upon approval of award by <Agency> of 100% of land required to be acquired

c. The Land award report shall contain details of:

i. Summary of compensation award status by village including:

1. total private and public land being acquired for the project (sq. m) - by village
2. date of 3A& 3D, final award by CALA, approval by <Agency> by village
3. variation of land area and nature of land use against that notified in 3D with reasons
4. Total award declared by village, claims made by beneficiaries and status of disbursement

ii. In detail for each village:

1. Updated land acquisition tracker containing parcel-wise status of each notification, award and disbursement
2. Method used by CALA for arrival on market value
3. Valuation report and details of Award calculation
4. Claims report (received under sub-section 3 of 3G)
5. Copies of notifications published, certificates received
6. Deviations in area according to CALA from provisions under sec. 26-30

iii. Key issues being faced in completing land acquisition and tentative timeline for completion

iv. A GIS map containing digitised details of land parcels shall be updated with all relevant land possession details and supplied in the agreed digital format

Stage 8: Land Possession

10.14 Submission of land possession report

a) The consultant shall submit a report on status of land possession upon receiving land possession certificates for 90% of linear length as per LA plan or as per the timeline as given in Enclosure I, whichever is earlier

b) The Consultant shall also submit an updated report containing all required details upon completion of 100% of land possession certificates

c) The land possession report shall contain

i. Summary of land possession status by village including:

- total private and public land being acquired for the project (sq. m) - by village
- date of final award by CALA, approval by <Agency>, notification (3E) to owners and receipt of land possession certificates from CALA by village
- Status of disbursement on the date of receipt of land possession certificate

ii. Key issues being faced in completing land acquisition and tentative timeline for completion

iii. Land possession certificates as received from CALA by village

iv. Updated land acquisition tracker containing parcel-wise status of each notification and disbursement status

v. A GIS map containing digitised details of land parcels shall be updated with all relevant land possession details and supplied in the agreed digital format

11. Interaction with <Agency>

1. During entire period of services, the Consultant shall interact continuously with <Agency> and provide any clarification as regards methods being followed and carryout modification as suggested by <Agency>. A programme of various activities shall be provided to <Agency> and prior intimation shall be given to <Agency> regarding start of key activities such as boring, survey etc. so that inspections of <Agency> officials could be arranged in time.

2. The <Agency>officers and other Government officers may visit the site at any time, individually or collectively to acquaint/ supervise the field investigation and survey works. <Agency> may also appoint a Proof Consultant to supervise the work of the DPR consultant including inter-alia field investigation, survey work, Design work and preconstruction activities

3. The consultant shall be required to send 3 copies of concise monthly Progress Report by the 5th day of the following month to the designated officer at his Head Quarter so that progress could be monitored by the <Agency>. These reports will indicate the dates of induction and de-induction of various key personnel and the activities performed by them. Frequent meetings with the consultant at site office or in Delhi are foreseen during the currency of project preparation.

4. All equipment, software and books etc. required for satisfactory services for this project shall be obtained by the Consultant at their own cost and shall be their property.

12. Payment Schedule

1. The Consultant will be paid consultancy fee as a percentage of the contract values as per the schedule given in the Draft Contract Agreement.

13. Data and Software

1. a. Consultants shall also deliver to <Agency> all basic as well as the processed data from all field studies and investigations, report, appendices, Annexure, documents and drawings in a digital format as described in Enclosure II over the course of this assignment and at the submission of the final report in the form of a removable storage device (CD or USB pen drive) and hosted in a secure online file hosting platform

   b. If required by <Agency> the consultant shall arrange at their own cost necessary software for viewing and measurement of imagery/ point cloud data.

      i. **Engineering Investigations and Traffic Studies:** Road Inventory, Condition, Roughness, Test Pit (Pavement composition), Falling Weight Deflectometer (FWD) Material Investigation including test results for subgrade soils, Traffic Studies (traffic surveys), axle load surveys, Sub-soil Exploration, Drainage Inventory, Inventory data for bridge and culverts indicating rehabilitation, new construction requirement etc. in MS EXCEL or any other format which could be imported to widely used utility packages.

      ii. **Topographic Surveys and Drawings:** All topographic data would be supplied in (x, y, z) format along with complete reference so that the data could be imported into any standard highway design software.The drawing files would be submitted in dxf or dwg format.

      iii. **Rate Analysis:** The Consultant shall submit the rate analysis for various works items including the data developed on computer in this relation so that it could be used by the Authority later for the purpose of updating the cost of the project.

      iv. Economic and Financial Analysis

2. **Software**: The Consultant shall also hand-over to <Agency> floppies/CD's containing any general software including the financial model which has been specifically developed for the project.

3. The floppy diskettes/CD's should be properly indexed and a catalogue giving contents of all floppies/CD's and print-outs of the contents (data from field studies topographic data and drawings) should be handed over to <Agency> at the time of submission of the Final Report.

4. Consultant shall include editable soft copies of the final versions of all documents, including but not limited to the strip plan, plan & profile drawings, cross sections of right of way and details of structures as well as any cost workings.

SUPPLEMENT-I

ADDITIONAL POINTS TO BE CONSIDERED FOR HILL ROADS IN ADDITION TO POINTS COVERED IN MAIN TOR

Sr. No.	Clause No. of TOR	Additional points
1.	2.2	a) Provisions of tunnels if required.
2.	2.3	a)Design of tunnels, if required b) Design of protective works, slope stabilization measures, erosion control measures, landslide control/protection measures snowdrift control/snow clearance measures, avalanche protection measures, if required
3.	3	Feasibility study and preparation of detailed project report for hill roads shall be done in accordance with best international practices and wherever practicable/feasible steep gradients and hair pin bends may be avoided by realignments by provision of structures and provision of tunnels if required
4.	4.1	a) Inventory and condition survey for tunnels, if required. b) Identification of faults in rock strata and impact of faults in design of tunnels, if required c) Detailed design of road considering and incorporating specific aspects related to hill region like terrain, topographic conditions, extreme weather conditions, altitude effects etc. d)Design of protective works, slope stabilization measures, erosion control measures, land slide control/protection measures, snow drift control/snow clearance measures, avalanche protection measures, if required e)Design of scenic overlooks/watering points etc.
5.	4.5 (1)	All activities related to field studies, design and documentation shall be done as per the latest guidelines/circulars of MORT&H and relevant publications of the Indian Roads Congress (IRC)/Bureau of Indian Standards (BIS) for hill roads. For aspects not covered by IRC and BIS, international standard practices, such as, British and American Standards may be adopted.
6.	4.7	Review of data and documents pertaining to a) Terrain and soil condition b) Condition of tunnels, if required. c) Sub-surface and geo-technical data for existing tunnels, if required. d) Drawing and details of existing tunnels, if required. e) Existing protective works, erosion control and land slide control/protection works,slope stabilization measures, snow drift control measures, avalanche protection measures f) Existing land slide and snow clearance facilities g) Geological details of rock strata in the area in case of tunnels

Sr. No.	Clause No. of TOR	Additional points
7.	4.11.1(1)	The Consultant should make an in depth study of available geological and Meteorological maps of the area.
8.	4.11.1(2)	The primary tasks to be accomplished during the reconnaissance survey shall also include: a) details of terrain (steep or mountainous), cliffs and gorges, general elevation of the road including maximum heights negotiated by main ascents and descents, total number of ascents and descents, hair pin bends, vegetation etc. b) Climatic conditions i.e. temperature, rainfall data, snowfall data, fog conditions, unusual weather conditions etc. c) Realignment requirements including provision of tunnels, if required. d) Inventory of tunnels and geologically sensitive areas like slip prone areas, areas subject to landslides, rockfall, snow drifts, erosion, avalanche activity etc.
9.	4.11.2.1 (3.ii)	Cross sections shall be taken at every 25 m. in case of hill roads and at points of appreciable changes in soil conditions. While taking cross sections, soil conditions shall also be recorded.
10.	4.11.3.1 (1)	The inventory data shall also include: a)General elevation of road indicating maximum & minimum heights negotiated by main ascents & descents and total no.of ascents & descents. b)Details of road gradients, lengths of gentle & steep slopes, lengths & location of stretches in unstable areas, areas with cliffs, areas with loose rocks, land slideprone areas, snow drift prone areas, no. & location of hairpin bends etc. c)Details of tunnels d)Details & types of protective structures, erosion & land slide control / protection measures, snow drift control measures, avalanche protection / control measures etc.
11.	4.11.3.2 (2)	Pavement: a)Location of crust failures along with their causes b) Conditions of camber/cross falls/super elevations etc., whether affected by subsidence Embankment: Extent of slope erosion on hill and valley side
12.	--	Condition Surveys & Investigation for Slope Stabilization, Erosion Control, Landslide Correction/Protection & Avalanche Protection Measures: a)Inventory & Condition Surveys of Existing Protective/Control Measures: The consultant shall make an inventory of all the structures related to Slope Stabilization, Erosion Control, Landslide Control/protection, Avalanche Protection etc. This shall include details of effectiveness of control measures already done and condition of protective/control structures. b) Landslide Investigation This shall be carried out to identify landslide prone areas, to suggest preventive measures or alternate routes that are less susceptible to landslide hazard. Further in existing slide areas this shall help to identify factors responsible for

Sr. No.	Clause No. of TOR	Additional points
		instability and to determine appropriate control measures needed to prevent or minimize recurring of instability problems.Initial preliminary studies shall be carried out using available contour maps, topographical maps, geological/geo-morphological maps, aerial photographs etc. for general understanding of existing slide area and to identify potential slide areas. This shall be followed by further investigations like geological/geotechnical/hydrological investigation to determine specific site conditions prevailing in the slide area as per relevant IRC specifications/publications, MORT&H circulars and relevant recommendations of the international standards for hill roads. The result of the investigations shall provide basis for engineering analysis and the design of protection/remedial measures.
13.	4.11.4.4	a) For tunnels if required, geotechnical and subsurface investigation shall be done as per IRC:SP:91. b) Geotechnical and subsurface investigation and testing for tunnels shall be carried out through the geotechnical Consultants who have the experience of geotechnical and subsurface investigation in similar project.
14.	4.12.1 (1)	The Consultant shall also carry out detailed designs and prepare working designs for the following: a) Cross sections at every 25 m intervals b) Slope stabilization and erosion control measures c) Design of protection/control structures in areas subject to subsidence, landslides, rock fall, rock slide, snow drifts, icing, scour, avalanche activity etc. d) Design of protective structures in slip prone and unstable areas e) Design of scenic overlooks, watering points etc. f) Safety features specific to hill roads
15.	4.12.2 (1) 4.12.2 (2)	The Consultant shall evolve Design Standards and material specifications for the Study primarily based on IRC publications, MORT&H Circulars and relevant recommendations of the international standards for hill roads for approval by <Agency>. The Design Standards evolved for the project shall cover all aspects of detailed design including the design of geometric elements, pavement design, bridges and structures, tunnels if required, traffic safety and materials.
16.	4.12.3	Wherever practicable/feasible hairpin bends and steep gradients shall be avoided by realignments, provision of structures or any other suitable provisions.
17.	4.12.4	While designing pavement for hill roads specific aspects relevant to hillregions like terrain & topographic conditions, weather conditions, altitude effects etc. shall be duly considered and suitably incorporated in design so that pavement is able to perform well for the design traffic and service life. Effects of factors like heavy rainfall, frost action, intensive snow and avalanche activity, thermal stresses due to temperature difference in day and night, damage by tracked vehicles during snow clearance operations etc. must also be considered along with traffic intensity, its growth, axle loads and design life.

Sr. No.	Clause No. of TOR	Additional points
18.	4.12.5(3)	The design of embankments should include the requirements for protection works and traffic safety features including features specific to hill roads.
19.	4.12.6	Design and Drawing of Tunnels: The Consultant shall prepare design and drawings for tunnels, if required as per the results of feasibility study, as per the relevant specifications of IRC:SP:91/MORT&H and other international specifications.
20.	4.12.7	a) Topography of hills generates numerous water courses and this coupled with continuous gradients of roads in hills and high intensity of rainfall calls for effective drainage of roads. The drainage system shall be designed to ensure that the water flowing towards the road surface may be diverted and guided to follow a definite path by suitable provision of road side drains, catch water drains, interceptors etc. and flow on valley side is controlled so that stability is not affected. b) Further, adequate provision shall be made for sub-surface/subgrade drainage to take care of seepage through the adjacent hill face of the road & underground water flows.
21.	4.12.8	The Consultant shall design suitable traffic safety features and road furniture including traffic signals, signs, markings, overhead sign boards, crash barriers, delineators etc. including any feature specific to hill roads. The locations of these features shall be given in the reports and also shown in the drawings.
22.	4.12.11	The Consultant shall make suitable designs and layout for miscellaneous works including rest areas, bus bays, vehicle parking areas, telecommunication facilities, scenic overlooks, watering points etc. wherever appropriate.
23.	10.9.3	Volume II: Design Report : a) Inventory of protection measures and other structures b) Inventory of tunnels, if required. b) Proposed preliminary designs for tunnels, if required. Volume III: Drawings a) Drawings for protection/control measures and other structures b) Drawings for tunnels, if required.
24.	10.9.3	Volume II: Design Report (Part II) Part II of Design Report shall also deal with design of tunnels, if required and design of other protection/control structures. Volume IX: Drawing Volume This shall also include : a) Detailed working drawings for tunnels, if required. b) Detailed working drawings for protection/control structures

SUPPLEMENT-II

ADDITIONAL REQUIREMENTS FOR BRIDGES

Sr.No.	Clause No. of TOR	*Additional points*
1	4.1	**For standalone bridge projects the scope of work shall include detailed design of approach road extending at least up to 2 km on either side of the bridge**
1.	4.11.4.2(6)	**Model Studies for Bridges** **1. Objective** Physical/ Mathematical Model study for detailed Hydraulic / Hydrologic investigations regarding the proposed bridge for hydraulic design of the bridge and assessment and hydraulic design of required river training works. **2. Methodology** Physical/Mathematical Model study shall be carried out at a reputed/recognized institution. The consultant will be responsible for identifying the institution, supplying Information /Documents /Data required for modal studies as indicated in para 4 below and coordinating the model study with the institution concerned **3. Scope of Work** **3.1 Physical Model study** Physical modeling with appropriate model scale for Hydraulic and Hydrologic Investigations to: i) Finalize span arrangement causing uniformity in flow distribution, and work out the alignment and orientation of river training works and bridge axis. ii) Provide information on estimated/observed maximum depth of scour. iii) Provide information on required river training works for proposed bridge iv) Provide hydraulic design for the bridge and the required river training works. v) Quantify the general direction of river course through bridge, afflux, extent and magnitude of flood, effect of backwater, if any, aggradation/degradation of bed, evidence of scour etc. shall be used to augment the available hydrological data. The presence of flood control/irrigation structures, if affecting the hydraulic characteristics like causing obliquity, concentration of flow, scour, silting of bed, change in flow levels, bed levels etc. shall be studied and considered in Hydraulic design of proposed bridge. The details of any planned work in the immediate future that may affect the river hydraulics shall be studied and considered. vi) Analyze effects of Wind Load on the Structures. **3.2 Mathematical Model study** Mathematical modeling for detailed Hydraulic / Hydrologic

Sr.No.	Clause No. of TOR	*Additional points*
		investigations regarding the proposed new bridge to: i) Finalize the site/location of the proposed new bridge based on mathematical modeling. ii) Provide information on estimated/observed maximum depth of scour. iii) Provide information on required river training works for proposed bridge iv) Provide hydraulic design for the bridge and the required river training works. v) Quantify the general direction of river course through bridge, afflux, extent and magnitude of flood, effect of backwater, if any, aggradation/degradation of bed, evidence of scour etc. shall be used to augment the available hydrological data. The presence of flood control/irrigation structures, if affecting the hydraulic characteristics like causing obliquity, concentration of flow, scour, silting of bed, change in flow levels, bed levels etc. shall be studied and considered in Hydraulic design of proposed bridge. The details of any planned work in the immediate future that may affect the river hydraulics shall be studied and considered. vi) Analyze effects of Wind Load on the Structures **4. Information/Documents/Data required for Physical /Mathematical Model study** i) Plan layouts showing the locations of the proposed bridge as well as the existing bridges /barrages etc., in the vicinity of the proposed bridge with the chainages with respect to a standard reference marked on it. ii) High flood discharges and corresponding flood levels at the locations of the existing bridges in the vicinity of the proposed bridge. iii) General arrangement drawing (GAD) of the existing bridges showing number of spans, pier and well dimensions, founding levels, maximum scour level, the design discharge and the HFL, guide bund details. On this, the plan form of the river course with the bridge alignment may also be shown as far as possible. iv) General arrangement drawing (GAD) of the proposed new bridge showing number of spans, pier and foundation dimensions. On this, the plan form of the river course with the bridge alignment may also be shown as for as possible. v) River cross sections at 500m longitudinal spacing (maximum) up to a distance of 2 times the bridge total length on the upstream side and up to a distance equal to the bridge total length on the downstream with right bank and left bank clearly marked on it. At least one cross section to be provided at the location of the proposed bridge. At each cross section, the bed levels to be taken at a maximum lateral distance of 8 m in flow section and at 25 m in non-flow section respectively. The abrupt variations in the bed levels to be captured by taking measurements at closer locations both in

Sr.No.	Clause No. of TOR	*Additional points*
		longitudinal as well as lateral directions. vi) The cross sections, as for as possible, from high bank to high bank. vii) The longitudinal profile of the river along the length of the proposed alignment. viii) Size distribution of the river bed material and the bore log data at different locations at the site of the proposed bridge. ix) The series of annual peak rainfall and flood of the river for at least 30 years period

SUPPLEMENT-III

ADDITIONAL REQUIREMENT FOR SAFETY AUDIT

The use of checklists is highly recommended as they provide a useful "aide memoire" for the audit team to check that no important safety aspects are being overlooked. They also give to the project manager and the design engineer a sense of understanding of the place of safety audit in the design process. The following lists have been drawn up based on the experience of undertaking systematic safety audit procedures overseas. This experience indicates that extensive lists of technical details has encouraged their use as "tick" sheets without sufficient thought being given to the processes behind the actions. Accordingly, the checklists provide guidelines on the principal issues that need to be examined during the course of the safety audits.

Stage F-During Feasibility Study

1. The audit team should review the proposed design from a road safety perspective and heck the following aspects

CONTENTS	ITEMS
Aspects to be checked	A. Safety and operational implications of proposed alignment and junction strategy with particular references to expected road users and vehicle types likely to use the road. B. Width options considered for various sections. C. Departures from standards and action taken. D. Provision of pedestrians, cyclists and intermediate transport E. Safety implicationsofthe schemebeyond itsphysical limits i.e. how the scheme fits into its environs and road Hierarchy
A1 : General	1. Departures from standards 2. Cross-sectional variation 3. Drainage 4. Climatic conditions 5. Landscaping 6. Services apparatus 7. Lay-byes 8. Footpath 9. Pedestrian crossings 10. Access (minimize number of private accesses) 11. Emergency vehicles 12. Public Transport 13. Future widening 14. Staging of contracts 15. Adjacent development
A2 : Local Alignment	1. Visibility 2. New/Existing road interface 3. Safety Aids on steep hills
A3 : Junctions	1. Minimise potential conflicts 2. Layout 3. Visibility
A4 : Non-Motorised road users Provision	1. Adjacent land 2. Pedestrians 3. Cyclists 4. Non-motorised vehicles

CONTENTS	ITEMS
A5 : Signs and Lighting	1. Lighting 2. Signs/Markings
A6:Construction and Operation	1. Build ability 2. Operational 3. Network Management

Stage 1 – Completion of Preliminary Design

1. The audit team should review the proposed check the following aspects design from a road safety perspective and check the following aspects	
CONTENTS	**ITEMS**
Aspects to be checked	A.Safety and operational implications of proposed alignment and junction strategy with particular references to expected road users and vehicle types likely to use the road. B.Width options considered for various sections. C.Departures from standards and action taken. D.Provision of pedestrians, cyclists and intermediate transport E.Safety implications of the scheme beyond its physical limits i.e. how the scheme fits into its environs and road hierarchy
B1 : General	1. Departures from standards 2. Cross-sectional variation 3. Drainage 4. Climatic conditions 5. Landscaping 6. Services apparatus 7. Lay-byes 8. Footpaths 9. Pedestrian crossings 10. Access (minimize number of private accesses) 11. Emergency vehicles 12. Public Transport 13. Future widening 14. Staging of contracts 15. Adjacent development
B2 : Local Alignment	1. Visibility 2. New/Existing road interface 3. Safety Aids on steep hills
B3 : Junctions	1. Minimise potential conflicts 2. Layout 3. Visibility
B4:Non-Motorisedroad users Provision	1. Adjacent land 2. Pedestrians 3. Cyclists 4. Non-motorised vehicles
B5 : Signs and Lighting	1. Lighting 2. Signs/Markings

B6:Construction and Operation	1. Build ability 2. Operational 3. Network Management

Stage 2 – Completion of Detailed Design

1. The audit team should satisfy itself that all issues raised at Stage 1 have been resolved. Items may require further consideration where significant design changes have occurred. 2. If a scheme has not been subject to a stage 1 audit, the items listed in Checklists B1 to B6 should be considered together with the items listed below.	
CONTENTS	**ITEMS**
Aspects to be checked	A. Any design changes since Stage 1. B. The detailed design from a road safety viewpoint, including the road safety implications of future maintenance (speed limits; road signs and markings; visibility; maintenance of street lighting and central reserves).
C1 : General	1. Departures from standards 2. Drainage 3. Climatic conditions 4. Landscaping 5. Services apparatus 6. Lay-byes 7. Access 8. Skid-resistance 9. Agriculture 10. Safety Fences 11. Adjacent development
C2 : Local Alignment	1. Visibility 2. New/Existing road interface
C3 : Junctions	1. Layout 2. Visibility 3. Signing 4. Lighting 5. Road Marking 6. T,X,Y-junctions 7. All roundabouts 8. Traffic signals
C4:Non-Motorisedroad users Provision	1. Adjacent land 2. Pedestrians 3. Cyclists 4. Non-motorised vehicles
C5 : Signs and Lighting	1. Advanced direction signs 2. Local traffic signs 3. Variable message signs 4. Other traffic signs 5. Lighting 6. Network Management

APPENDIX- VI B

Terms of reference for phase 3: Construction supervision and maintenance

[Note: The term Agreement and caluses thereof refered to the EPC agreement to be entered between Authority and .... contractor for the work of ..... on Engineering Procurement Construction (EPC) basis]

1. Scope

1.1 These Terms of Reference (the "**TOR"**) for the Authority's Engineer are being specified pursuant to the EPC Agreement..... (the "**Agreement**"), which has to be entered into between the Authority and ..... (the "**Contractor**") for **(work...)**on Engineering, Procurement, Construction (EPC) basis.

1.2 The TOR shall apply to construction and maintenance of the Project Highway.

2. Definitions and interpretation

2.1 The words and expressions beginning with or in capital letters and not defined herein but defined in the Agreement shall have, unless repugnant to the context, the meaning respectively assigned to them in the Agreement.

2.2 References to Articles, Clauses and Schedules in this TOR shall, except where the context otherwise requires, be deemed to be reference to the Articles, Clauses and Schedules of the Agreement, and references to Paragraphs shall be deemed to be references to Paragraphs of thisTOR.

2.3 The rules of interpretation stated in Clauses 1.2, 1.3 and 1.4 of the Agreement shall apply, *mutatis mutandis*, to thisTOR.

3. General

3.1 The Authority's Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.

3.2 The Authority's Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement, but subject to obtaining prior written approval of the Authority before determining.

(a) any Time Extension.

(b) Any additional cost to be paid by the Authority to the Contractor;

(c) The Termination Payment; or

(d) Any other matter which is not specified in (a), (b) or (c) above and which creates an obligation or liability on either Party for a sum exceeding Rs. 5,000,000 (Rs. Fifty lakh.)

3.3 The Authority's Engineer shall submit regular periodic reports, once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.

3.4 The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however, that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause 18.2 EPC Agreement.

3.5 TheAuthority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13.

3.6 In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the Authority's Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

4. Role and responsibility of Officers of the Authority

The officer in-charge of the Authority (e.g.PD/RO/CGM/Member in the case of NHAI; RO/CE/ADG in the case of MoRTH projects executed through the State PWDs; and PD/ED/Director in the case of NHIDCL) is responsible for the overall supervision and monitoring of the execution of project as the representative of the owner of the project. The Authority's Engineer is appointed to assist the Authority for carrying out the functions as detailed under clause 18.2 of the EPC Agreement. As such, an officer of the Authority is vested with all such powers and responsibilities as are enjoined upon the Authority's Engineer and is fully competent to issue any instructions for proper monitoring and supervision of the project, either by himself or through the Authority's Engineer. Instructions issued by the concerned officer of the Authority shall have the same effect as that of the Authority's Engineer in terms of this Agreement. Wherever such concerned officer issues any instructions or notice to the Contractor, he shall endorse a copy thereof to the Authority'sEngineer.

5 ConstructionPeriod

5.1 During the Construction Period, the Authority's Engineer shall review and approve the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1.6 of EPC Agreement. The Authority's Engineer shall complete such review and approve and send its observations to the Authority and the Contractor within 15(fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days. In particular, such comments shall

specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

5.2 The Authority's Engineer shall review and approve any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings. The review/approval of drawing should be authenticated by Authority's Engineer.

5.3 Quality Assurance Manual and Plan forms the basis of quality of the work. It is therefore essential that the Quality Assurance Manual and Plan prepared by the Concessionaire be checked and approved. Thus, the Authority's Engineer shall check contents of Quality Assurance Plan and Manual of Concessionaire as per requirements of Quality Management System (as per ISO 9001), IRC Special Publication-112:2017 (Manual for Quality control in Road & Bridge. The Authority's Engineer shall also offer their comments for modifying/ improving the document. After receiving the corrected document, the Authority's Engineer shall review and formally approve the QAM and Quality Plan and send one copy to the Authority. The Authority's Engineer shall complete the review of the methodology proposed to be adopted by the Contractor for executing the Works, and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.

5.4 The Authority's Engineer shall grant written approval to the Contractor, where necessary, for interruption and diversion of the flow of traffic in the existing lane(s) of the Project Highway for purposes of maintenance during the Construction Period in accordance with the provisions of Clause 10.4 EPC Agreement.

5.5 The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the contractor within 7 (seven) days of receipt of such report.

5.6 On a daily basis, the concerned key personnel of Authority Engineer shall inspect the Construction Works. Following activities need to be undertaken during the visits.

- Review of construction including progress, quality and safety of construction
- Inspection of defects and deficiencies in construction works
- Witnessing quality inspection tests at labs established by Concessionaire on a sample basis

Review of quality of work shall be done in reference to Quality Assurance Plan (QAP)/Manual and ISO 9001:2008, IRC: SP: 47-1998 and IRC: SP: 57-2000 for road bridges and roads respectively. The Authority's Engineer also needs to capture following documents and send to <agency> field office via email on a daily basis

- *Scanned copy of filled RFI (Request for Inspection) form including commentary on 'Satisfactory/Unsatisfactory' nature of work completed by Concessionaire*
- *Daily inspection report Proforma as provided in Enclosure I B1*
- *Readings of quality inspection tests witnessed by the Consultant*
- *Minimum 6 high resolution photographs supporting the remarks made by the Authority's Engineer in RFI form*

Team Leader will be responsible for sending daily emails to <agency> office.

5.7 On a monthly basis, the Authority Engineer shall prepare a **Monthly Inspection Report** in accordance with the format prescribed in **Enclosure I B 5** setting forth an overview of the status, progress, quality and safety of construction, including the work methodology adopted, the materials used and their sources, and conformity of Construction Works with the Scope of the Project and the Specifications and Standards. In a separate section of the Inspection Report, the Authority Engineer shall describe in reasonable detail the lapses, defects or deficiencies observed by it in the construction of the Project Highway. The Authority Engineer shall send a copy of its Inspection Report to the Authority and the Concessionaire latest by 7th of every month. Key sections of the Monthly Progress Report are as follows.

S No.	Section	Sub-Sections
1	**Executive Summary**	1.1 Construction progress in current month
		1.2 Summary of strip plan
		1.3 Detailed strip plan
		1.4 Current issues and recommended actions by AE
2	**Project Overview**	2.1 Salient Features of the Project
		2.2 Project Milestones
		2.3 Location Map
		2.4 Key Plan
3	**Critical issues and Actionlog**	3.1 Pending issues and action log
		3.2 Obligations as per contract
4	**Physical Progress**	4.1 Detailed physical progress by component
5	**Land Acquisition andClearances**	5.1 LA summary
		5.2 LA detail by CALA
		5.3 LA detail by village
		5.4 Manpower with each CALA
		5.5 Clearances summary
		5.6 Status of utility shifting
6	**Change of Scope**	6.1 Status of pending COS proposals
7	**Mobilization of Resources**	7.1 Resource mobilization by contractor/ concessionaire
8	**Financial Progress Details**	8.1 Pen picture- Escrow
		8.2 Escrow details
9	**Summary of quality controltests**	9.1 Tests witnessed by IE/AE
		9.2 Tests conducted by IE/AE
10	**Monitoring of maintenance obligations during construction phase**	10.1 Critical issues and action log
		10.2 Cumulative defects and deficiencies
		10.3 Status of damages
11	**Safety features**	11.1 Pen picture on safety features at construction site
		11.2 Accident report
12	**Annexures**	Annexure1:Detailed list of physical components as per Schedule G
		Annexure 2 onwards: Additional details provided by AE

5.8 If at any time during the Construction Period, the Authority Engineer determines that the Concessionaire has not made adequate arrangements for the safety of workers and Users in the zone of construction or that any work is being carried out in a manner that threatens the safety of the workers and the Users, it shall make a recommendation to the Authority forthwith, identifying the whole or part of the Construction Works that should be suspended for ensuring safety in respect thereof.

5.9 The Authority's Engineer shall conduct the pre-construction review of manufacturer's reports and standard samples of manufactured Materials, and such other Materials as the Authority's Engineer may require.

5.10 For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance. For purposes of this, the tests specified in the IRC Special Publication-112:2017 (Manual for Quality control in Road & Bridge works and the Specifications for Road and Bridge Works issued by MORT&H (the "Quality Control Manuals") or any modifications/substitution thereof shall be deemed to be tests conforming to Good Industry Practice for quality assurance.

5.11 The Authority's Engineer shall test check at least 60(sixty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.

5.12 The timing of tests referred to in Paragraph 5.10, and the criteria for acceptance/rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.

5.13 In the event that results of any tests conducted under Clause 11.10 establish any Defects or deficiencies in the Works, the Authority's Engineer shall require the Contractor to carry out remedial measures.

5.14 The Authority's Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Project Highway, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work required on account of a Force Majeure Event, the provisions of Clause 21.6 of EPC Agreement shall apply.

5.15 In the event that the Contractor fails to achieve any of the Project Milestones, the Authority's Engineer shall undertake a review of the progress of construction and identify potential delays, if any. If the Authority's Engineer shall determine that completion of the Project Highway is not feasible within the time specified in the

Agreement, it shall require the Contractor to indicte within 15 (fifteen) days the steps proposed to be take to expedite progress, and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor, the Authority's Engineer shall review the same and send its comments to the Authority and the Contractor forthwith.

5.16 The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.2 of EPC Agreement.

5.17 Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the Users and pedestrians. After the Contractor has carried out remedial measure, the Authority's Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension here under may be revoked.

5.18 In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and users, and requires the Authority's Engineer to inspect such works, the Authority's Engineer shall inspect the suspended works within 3 (three) days of receiving such notice, and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.

5.19 The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-K and issue a Completion Certificate or Provisional Certificate as the case may be. For carrying out functions under this Paragraph and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K. The Authority's Engineer shall use following equipment in carrying out thetests.

S No	Key metrics of Asset	Equipment to be used
1	Surface defects of pavement	Network Survey Vehicle (NSV)
2	Roughness of pavement	Laser Profilometer
3	Strength of pavement	Falling Weight Reflectometer (FWD)
4	Bridges	Mobile Bridge Inspection Unit (MBIU)
5	Road signs and road markings	Retro-reflectometer

6 Maintenance Period

6.1 The Authority's Engineer shall aid and advise the Contractor in the preparation of its monthly Maintenance Programme and for this purpose carry out a joint monthly inspection with Contractor.

6.2 The Authority's Engineer shall undertake regular inspections, at least once every month to evaluate compliance with the Maintenance Requirements and submit a Maintenance Inspection Report to the Authority and the Contractor.

6.3 Visual Inspection of project highway

6.3.1 The Authority Engineer shall carry out visual inspection of entire highway stretch as per the frequency defined in the following table

Nature of defect or deficiency		**Frequency of inspection**
ROADS		
(a)	**Carriageway and paved shoulders**	
(i)	Breach or blockade	Daily
(ii)	Pot holes	Daily
(iii)	Cracking	Weekly
(iv)	Rutting	Weekly
(v)	Bleeding/skidding	Weekly
(vi)	Ravelling/Stripping of bitumen surface	Weekly
(vii)	Damage to pavement edges	Weekly
(viii)	Removal of debris	Daily
(b)	**Hard/earth shoulders, side slopes, drains and culverts**	
(i)	Variation by more than 2% in the prescribed slope of camber/cross fall	Weekly
(ii)	Edge drop at shoulders	Weekly
(iii)	Variation by more than 15% in the prescribed side (embankment) slopes	Weekly
(iv)	Rain cuts/gullies in slope	Weekly
(v)	Damage to or silting of culverts and side drains during and immediately preceding the rainy season	Weekly
(vi)	Desilting of drains in urban/semi-urban areas	Daily
(c)	**Road side furniture including road signs and pavement marking**	
(i)	Damage to shape or position; poor visibility or loss of retro-reflectivity	Daily
(d)	**Street lighting and telecom (ATMS)**	
(i)	Any major failure of the system	Daily
(ii)	Faults and minor failures	Daily
(iii)	Streetlight with Lux Meter	Weekly
(e)	**Trees and plantation**	
(i)	Obstruction in a minimum head-room of 5 m above carriageway or obstruction in visibility of road signs	Daily
(ii)	Deterioration in health of trees and bushes	Weekly
(iii)	Replacement of trees and bushes	Weekly
(iv)	Removal of vegetation affecting sight line and road structures	Weekly
(f)	**Rest areas/Wayside amenities**	
(i)	Cleaning of toilets	Daily
(ii)	Defects in electrical, water and sanitary installations	Daily
(g)	**Toll plaza[s]**	
(i)	Failure of toll collection equipment including ETC or lighting	Daily
(ii)	Damage to toll plaza	Weekly
(h)	**Other Project Facilities and Approach roads**	

(i)	Damage or deterioration in Approach Roads, -[pedestrian facilities, trucklay-bys, bus-bays, bus-shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works]	Daily
(j)	**Incident Management**	

Nature of defect or deficiency		**Frequency of inspection**
(i)	Instances of Incident Management as reported including time of call, response time, services rendered and time of clearing of the Highway.	Daily
(ii)	List of the Incident Management Services rendered.	Weekly
BRIDGES		
(a)	**Superstructure of bridges**	
(i)	Cracks	Weekly
(ii)	Spalling/scaling	Weekly
(b)	**Foundations of bridges**	
(i)	Scouring and/or cavitation	Weekly
(c)	**Piers, abutments, return walls and wing walls of bridges**	
(i)	Cracks and damages including settlement and tilting	Weekly
(d)	**Bearings (metallic) of bridges**	
(i)	Deformation	Weekly
(e)	**Joints in bridges**	
(i)	Loosening and malfunctioning of joints	Weekly
(f)	**Other items relating to bridges**	
(i)	Deforming of pads in elastomeric bearings	Weekly
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weepholes andvent-holes	Weekly
(iii)	Damage or deterioration in parapets and handrails	Weekly
(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	Weekly
(v)	Damage to wearing coat	Weekly
(vi)	Damage or deterioration in approach slabs, pitching, apron, toes, floor or guide bunds	Weekly
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	Weekly

6.3.2 All elements which have daily inspection frequency shall be inspected weekly as well. Similarly, all elements which have weekly inspection frequency shall be inspected monthly as well.

6.3.3 Daily inspection report format and weekly inspection report format has been provided in **IB2** and **Enclosure IB3** of this document respectively. Manpower which needs to conduct visual inspection and mode of reporting is defined in the following table

Frequency of inspection	**Inspection to be carried out by**	**Mode of reporting**
Daily	Sub-professional staff	Soft copy by Email
Weekly	Key personnel	Soft copy by Email
Monthly	Key personnel	Hard copy and Soft copy

6.3.4 High resolution photographs and video of the highway stretches having defects and/or deficiencies shall be submitted along with Weekly Inspection Report and

Monthly Status Report. Summary of key observations around defects and deficiencies in highway stretch shall be reported in Monthly Progress Report and detailed inspection report shall be provided as Annexure to Monthly ProgressReport.

6.3.5 The Authority's Engineer shall also be responsible for inspection and monitoring of Wayside Amenities. ETC (Electronic Toll Collection) and ATMS (Advanced Traffic Management System) and incident management.

6.4 Road conditions surveys

6.4.1 The carrying out of condition surveys will be one of the most important and crucial field tasks under the project. The Authority Engineer shall carry out condition surveys using equipment and following a frequency as defined under.

S No	Key metrics of Asset	Equipment to be used	Frequency of condition survey
1	Surface defects of pavement	Network Survey Vehicle (NSV)	At least twice a year (As per survey months defined for the state basis rainy season)
2	Roughness of pavement	Laser Profilometer	At least twice a year (As per survey months defined for the state basis rainy season)
3	Strength of pavement	Falling Weight Reflectometer (FWD)	At least once a year
4	Bridges	Mobile Bridge Inspection Unit (MBIU)	Atleast twice a year (As per survey months defined for the state basis rainy season)
5	Road signs	Retro-reflectometer	Atleast twice a year (As per survey months defined for the state basis rainy season)

The first equipment based inspection shall be conducted at the time of completion testing. The other inspections shall be conducted before and after the rainy seasons as per the schedule defined in **Enclosure I B 4**, except for FWD testing which shall be conducted once a year.

Calibration of equipment, wherever needed, is required to be done in presence of Competent Authority. Once approval of equipment, the settings and a sample data set is provided by Competent Authority, network level data for entire project stretch can be collected. Month of survey for each state has been defined in **Enclosure I B 4** of this document.

6.4.2 Measurement of pavement surface defects and roughness

i. The Authority Engineer shall use Network Survey Vehicles mounted with equipment such as Laser based automatic crack detection , high resolution digital cameras for RoW and pavement, high accuracy DGPS receiver and in vehicle data processing software or better technology to accurately measure following pavement surface properties

Surface defect	Dimensions to be reported
Cracking	• Length • Width • Depth
Potholes	• Area • Depth
Raveling	• Indicator

Surface defect	Dimensions to be reported
	% • Area
Rutting	• Depth • Width
Concrete Joint/ Faulting	• Length
Roughness	• IRI in both wheel paths

ii. The following criteria shall be met by the process of defects detection

- Measurement of 3D road profile using such technologies as laser scanning or other proven technologies.
- Ability to operate (collect data) at different speeds with a minimum speed of 30km/hr and upto at least 75 km/ hr.
- Profile depth accuracy of 0.5mm
- Capability for lane tracking to control driver wander' and ensure high repeatability of data between surveys.
- Measure at least 3.5m width of highwaylane.
- Transverse Profile including rut depth measurement of pavement surface widths of both carriageway and shoulders. The rut depth data must be convertible to different straightedge lengths (1.8m to 3.5m) and meet industry standards (ASTM E1703 /E1703M).
- Pavement images with capability to automatically identify and rate distresses
- Roughness measurement with outputs of both raw longitudinal profiles and International Roughness Index (IRI) calculation shall be reported atleast 100m referenced to the preceding Location Reference Post (LRP). The roughness must meet ASTM-E950 (equivalent to Class I road profiler). The IRI shall be determined in both wheelpaths.
- Ability to record images at user-defined intervals (e.g. every 5, 10m, etc.)
- Minimum images resolution of 1600x1200
- Outputs must include Standard JPEG image or similar industry standard
- Distance resolution of <1mm,
- Capable of achieving distance accuracy of 0.1% (i.e. within 1m over 1km distance)
- All data outputs should be in a non-proprietary format (e.g. .CSV, .MDB, Excel) and not require specialist software in order to view or format data
- Data should also be capable of being easily formatted into data compatible with HDM-4

iii. The following are the set of deliverables which should be submitted after completion of survey as part of Monthly Progress Report

- Raw data generated from the equipment which are part of Network Survey covering the parameters mentioned in above table. It should also include
    - Survey ID, Description, Date,Lane
    - GPS referenced data for GISmapping
- Videologging
    - Pavement imagery(AVI/JPEG)
    - 360 degree imagery(JPEG)

- Interpretation report covering summary of entire survey and analysis of defects and deficiencies

6.4.3 Measurement of pavement strength

(i) The Authority Engineer shall carry out structural strength surveys for existing pavements using Falling Weight Deflectometer technique in accordance with the procedure given in IRC:115-2014 (Guidelines for Structural Evaluation and Strengthening of Flexible Road Pavements Using Falling Weight Deflectometer (FWD) Technique) and IRC: 117-2015 (Guidelines for the Structural Evaluation of Rigid Pavement by Falling Weight Deflectometer)

(ii) The interval at which deflection measurements are to be taken up are as per IRC:115-2014 / IRC:117-2015. For flexible pavements, the sample size and the interval of the data to be collected depends on the length of the uniform section calculated and condition of the pavement section i.e. 'good', 'fair' and 'poor' for each lane, established on the pavement condition data based on the criterion given in IRC:115-2014. For rigid pavements, the deflection data may be collected at interiors, corners, transverse joints and longitudinal joints in the outer lanes at intervals as specified in IRC:117-2015.

(iii) The following are the set of deliverables which should be submitted after completion of inspection test as part of Monthly Progress Report

- Data report covering following parameters
  - Deflection Bowl (Transient Deflections at seven different points)
  - Corrected Elastic Modulus Bituminous E1
  - Corrected Elastic Modulus Granular E2
  - Corrected Elastic Modulus Subgrade E3
  - Subgrade CBR
- Interpretation report covering summary of entire survey results and analysis of key parameters

6.4.4 The Authority Engineer shall carry out the condition and structural assessment survey of the bridges in accordance with IRC-SP; 35 with the use of Mobile Bridge Inspection unit (MBIU) or better technology.

(i) The following criteria shall be met by the process of bridge condition assessment

- Automatic folding and unfolding of platform
- 90 degree rotation ofplatform
- Sufficient safety features to be incorporated such as dedicated power supply, emergency cut off system,etc
- Complete access to hidden parts of the bridge by the raters

(ii) Detailed bridge inspection report shall be submitted as per the Inspection Proforma provided in IRC-SP35

6.4.5 Measurement of retroreflection of roadsigns

(i) The Authority Engineer shall measure Coefficient of retroreflected luminance RA(night time retro reflection) of road traffic signs using a portable retroreflectometer.

(ii) The following criteria shall be met by the process of road signs retro reflection measurement

- Measurement of retroreflective signs shall be conducted in accordance with ASTM E1709 and ASTM E2540
- Measurement time after pressing trigger shall be less than or equal to 1sec
- Observation angle adjustment from 0.2 degrees to 2.0 degrees
- Entrance angle adjustment from -45 degrees to +45 degrees
- Self-contained commercially available battery
- Inbuilt data storage of at least 2,000 measurements so that data transfer requirement is minimized while the survey is being conducted
- Interface for transferring data from device to Computer
- Built in GPS to capture GPS coordinates of roadsign
- Range shall be at least 0-2000 cd/lx/m^2

(iii) The following are the set of deliverables which should be submitted after completion of survey as part of Monthly Progress Report

- System generated coefficient of retro reflected luminance RA (nighttime retro reflection) of all road signs
- Interpretation report covering analysis of road signs falling in different range of RA and actions to betaken

6.5 The Authority Engineer shall carry out following inspections of ETC lanes at tollplazas on a month basis:

(i) Infrastructure:

- *Availability of civil infrastructure at toll plazas required for installation of ETC systems*
- *Adequacy of hardware, software and other related items as per IHMCL/*MORT&H *technical specifications and requirements*

(ii) Operations:

- *Adherence of various stakeholders (acquirer bank, system integrator, toll*

operator, issuer bank etc) of the ETC system to the service level agreements

- *Efficacy of the ETC system (RFID tagging, AVC, WIM etc) in terms of accuracy and uptime*
- *Tracking and reporting toll plaza experience metrics such as average waiting time, transaction times for different modes of payment (RFID, cash, smart cards, QRcodesetc) and congestion levels (eg. length of queue in different lanes) across 4 different times in a day*
- *Robustness of dispute resolution mechanisms in place for the tag holder and toll operators by the issuer and acquirerbanks*

6.6 The Authority Engineer shall prepare a Monthly Status Report in O&M phase of project in respect of its duties and functions under this Agreement and in accordance with the format prescribed in **Enclosure I B 6**. 1st deliverable of the report which is an executive summary to the main report (Section 1) shall be submitted to the Authority and updated on the PMIS and project specific website by 4th of every month. Main report (Section 2 onwards) shall be submitted to the Authority and updated on the PMIS and project specific website by 7th of every month. Key sections of the Monthly Status Report are as follows;

S.No	Sections	Sub sections
1	**Executive Summary**	1.1 Overall road condition
		1.2 Key reporting metrics
		1.3 Key maintenance activities undertaken
		1.4 Pending issues
		1.5 Recommended actions by AE
		1.6 Strip plan for maintenance
2	**Project Overview**	2.1 Key project details
		2.2 Location map
		2.3 Key plan
		2.4 Summary of project features
		2.5 RoW availability
3	**Critical issues and action taken**	3.1 Issue and action log
		3.2 Summary of deficiencies
		3.3 Obligations as per contract
		3.4 Inspection schedule
4	**Monthly Inspection Report**	4.1 Summary of NCR issued
		4.2 Equipment based inspection report
5	**Monitoring of ETC Lanes**	5.1 Monthly ETC Report
		5.2 On-ground infrastructure report
		5.3 On ground ETC operations & SLA adherence
6	**Status of damages**	6.1 Damages for non completion of project facilities
		6.2 Damages for breach of maintenance activities
		6.3Damages for non completion of major maintenance works

7	**Change of Scope proposals**	7.1 Change of Scope proposals
8	**Status of pending disputes**	8.1 Status of pending disputes
9	**Reports**	9.1 Toll collection statement
		9.2 Accident Report
S.No	**Sections**	**Sub sections**
		9.3 Details of user complaints
		9.4 Encroachment list
		9.5 Lane closure report
10	**Annexures**	AnnexureI-Detailed visual inspection report of project highway
		Annexure II onwards- Additional details provided by AE

6.7 The Authority's Engineer shall specify the tests, if any, that the Contractor shall carry out, or cause to be carried out, for the purpose of determining that the Project Highway is in conformity with the Maintenance Requirements. It shall monitor and review the results of such tests and remedial measures, if any, taken by the Contractor in this behalf.

6.8 In respect of any defect or deficiency referred to in Paragraph 3 of Schedule-E, the Authority's Engineer shall, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards and shall also specify the time limit for repair or rectification of any deviation or deterioration beyond the permissiblelimit.

6.9 The Authority's Engineer shall examine the request of the Contractor for closure of any lane(s) of theProject Highway for undertakings maintenance/repair thereof, and shall grant permission with such modifications, as it may deem necessary, within 5 (five) days of receiving a request from the Contractor. Upon expiry of the permitted period of closure, the Authority's Engineer shall monitor the reopening of such lane(s), and in case of delay, determine the Damages payable by the Contractor to the Authority under Clause 14.5 of EPC Agreement

7 Determination of costs and time

7.1 The Authority's Engineer shall determine the costs, and/or their reasonableness, that are required to be determined by it under the Agreement.

7.2 The Authority's Engineer shall determine the period of Time Extension that is required to be determined by it under the Agreement.

7.3 The Authority's Engineer shall consult each Party in every case of determination in accordance with the provisions of Clause 18.5 of EPC Agreement.

8 Payments

8.1 The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provision of Clause 10.2.4 (d) of EPC Agreement.

8.2 Authority's Engineer shall

(a) within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 19.4, determine the amount due to the Contractor and recommend the release of 90(ninety) percent of the amount so determined as part payment, pending issue of the Interim Payment Certificate; and

(b) within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the Contractor, after adjustments in accordance with the provisions of Clause 19.10 of EPC Agreement.

8.3 The Authority's Engineer shall, within 15 (fifteen) days of receipt of the First stage Maintenance Payment Statement from the Contractor pursuant to Clause 19.6 of EPC Agreement, verify the Contractor's statement and certify the amount to be paid to the Contractor in accordance with the provisions of the Agreement.

8.4 The Authority's Engineer shall certify final payment with 30(thirty) days of the receipt of the final payment statement of Maintenance in accordance with the provisions of Clause 19.16 of EPC Agreement.

9 Other duties and functions

The Authority's Engineer shall perform all other duties and functions as specified in the Agreement.

10 Miscellaneous

10.1 All key personnel and sub professional staff of the Authority Engineer shall use the fingerprint based (biometric) attendance system for marking their daily attendance. Attendance shall be marked atleast once a day and anytime during the day. 1 Biometric Attendance System shall be installed by the Authority Engineer at its own cost at the site office in order to facilitate the attendance marking. More systems can be installed near the project highway upto a maximum of 1 system per 50km in order to encourage frequent visits of project highway by key personnel and sub professional staff. A copy of monthly attendance records shall be attached with Monthly Status

Report. Proper justification shall be provided for cases of absence of key personnel/ sub professional staff which do not have prior approval from Project Director of concerned stretch.

10.2 A copy of all communications, comments, instructions, Drawings or Documents sent by the Authority's Engineer to the Contractor pursuant to this TOR, and a copy of all the test results with comments of the Authority's Engineer thereon, shall be furnished by the Authority's Engineer to the Authority forthwith.

10.3 The Authority's Engineer shall retain at least one copy each of all Drawings and Documents received by it, including 'as – built' Drawings and keep them in its safe custody.

10.4 Within 90 (ninety) days of the Project Completion Date, the Authority's Engineer shall obtain a complete set of as-built Drawings in 2(two) hard copies and in microfilm form or in such other medium as may be acceptable to the Authority, reflecting the Project Highway as actually designed, engineered and constructed, including an as-built survey illustrating the layout of the Project Highway and setback lines, if any, of the buildings and structures forming part of project Facilities; and shall hand them over to the Authority against receipt thereof.

10.5 The Authority's Engineer, if called upon by the Authority or the Contractor or both, shall mediate and assist the Parties in arriving at an amicable settlement of any Dispute between the Parties.

10.6 The Authority's Engineer shall inform the Authority and the Contractor of any event of Contractor's Default within one week of its occurrence.

11. PERFORMANCE CLAUSE

Authority's Engineers shall be expected to fully comply with all the provisions of the `Terms of Reference', and shall be fully responsible for supervising the Designs, Construction and maintenance and operation of the facility takes place in accordance with the provisions of the EPC Agreement and other schedules. Any failure of the Authority Engineer in notifying to Employer and the Contractor on non-compliance of the provisions of the EPC Contract Agreement and other schedules by the EPC Contractor, non-adherence to the provision of ToR and non-adherence to the time schedule prescribed under ToR shall amount to non-performance.

The Authority Engineer shall appoint its authorized representative, who shall issue on behalf of the AE, Completion Certificate along with the Team Leader and shall carryout any such task as may be decided by Employer. The AE shall take prior approval of Employer before issuing Completion Certificate. The proposal submitted shall also include the name of the authorized representative along with the authorization letter and power of attorney.

12. CONSULTANT'S PROPOSAL

12.1 List of key personnel to be fielded by the Consultants shall be as below:

Normal Highway Project:

i. Team Leader Cum Senior Highway Engineer
ii. Resident cum Highway cum pavement Engineer
iii. Senior Quantity cum Material Expert
iv. Senior Bridge Engineer
v. Senior Pavement Specialist
vi. Road/Traffic Safety Expert

Standalone Bridge Project:

i. Team Leader Cum Senior Bridge Construction Engineer
ii. Resident cum Pavement Specialist
iii. Bridge/Structural Engineer
iv. Senior Contract Specialist
v. Road Safety Expert
vi. Senior Quality cum Material Expert

Standalone Tunnel Project:

i. Team Leader Cum Senior Tunnel Expert
ii. Resident cum Excavation Specialist
iii. Senior Geotechnical Expert
iv. Tunnel Design Engineer
v. Tunnel Safety Expert
vi. Senior Contract Specialist
vii. Senior Geologist

12.2 Broad job-description and minimum qualification for key personnel mentioned above is enclosed as **Appendix-IB (Part-I)**. However, higher marks shall be accorded to the Candidate with higher relevant qualification and experience. The **age of the Key Personnel should not be more than 65 years as on date of submission of bid/proposal.** Consultants are advised in their own interest to frame the technical proposal in an objective manner as far as possible so that these could be properly assessed in respect of points to be given as part of evaluation criteria. The bio-data of the key personnel should be signed on every sheet by the personnel concerned and the last sheet of each bio-data should also be signed by the authorised signatory for the Consultant. The key personnel shall also certify at the end of their bio- data proforma that they have not left any of the Employer works without completing of their assignment and have not accepted any other offer at the time of signing of the bio-data and as such shall be available to work with the Authority Engineer. In case

the key personnel leaves the assignment without approval of Employer, Employer would be at liberty to take any appropriate action against that key personnel including debarment. The CV submitted by selected firm/JV shall be hoisted on official website ofEmployer. **It is clarified that CVs for the key Personnel to be deployed during supervision phase shall be submitted at the time of start of construction and supervision work.**

12.3 In addition to above, consultants are required to propose other key personnel, sub-professional staff and other field engineers as detailed in **Appendix-IA (Part-I)** and the minimum qualification requirements for the same is enclosed in **Appendix-IB (Part-I)**.

13. PERIOD OF SERVICES

13.1 The services of an Authority's Engineer will be in phases as per Contract Agreement.

13.1.1 The time period for construction supervision shall be as per Annexure A of LOI.

14. Project Coordinator

The Firm shall appoint a personnel from its head office to act as Project Coordinator for the assignment. He will be authorised to communicate with the Authority in respect of all matters pertaining to the project. The cost of the Project Coordinator shall be incidental to the Consultancy Assignment.

ENCLOSURE-I A

Schedule for submission of Reports and Documents for Phase-1 & 2

StageNo.	Activity	No. ofcopies	TimePeriod in days from date of commencement
1	**Monthly Reports**	3	By 10th day of every month
2	**Inception Report** (i) Draft Inception Report including QAP document (ii) Inception Report including QAP document	 3 3	 21 30
3	**F.S. REPORT** i)Draft Feasibility Study Report including option study report including draft 3(a)report ii)Comments of client iii)Final Feasibility Study Report incorporating compliance of comments of Client	 4 1 4	 90 100 **120**
4	**LA & Clearances I Report** i) Draft LA & Clearances I Report including draft 3(A) report ii) Comments of client iii) Final LA & Clearances I Report incorporating compliance of comments of Client	 4 1 4	 150 **180** 210
5	**Detailed Project Report** i)Draft DPR ii)Comments of client iii)Final DPR incorporating compliance of comments of Client	 4 1 6	 240 270 **300**
6	**Technical Schedules** i) Draft Technical Schedules ii) Comments of client iii) Final technical schedule	 4 1 6	 **240** **270** **300**
7	**Land Acquisition II** **Submission of draft 3D publication report**	4	**350**
8	**Land AcquisitionIII, Award determination (3G)**		**400**
9	**Project Clearances& LA IV Report** **Approval of Project clearances** from Concerned agencies e.g. from MOEF; Rly for approval of GAD and detail engineering drawing of ROB/RUB;	6 Original letters from the concerned agencies and 5	**540**

	Irrigation Dept.,Utility Report and Possession of Land	photocopies of each	

The checklist for different stages of submission of report has been enclosed as under and the same shall be appended with proper references and page numbering. The checklist/s shall be appended with the report without which no payment shall be made.

Schedule for approval of Reports and Documents by PD after submission by Consultant.

StageNo.	Activity	Time Period in days from date of submission of Comment and acceptance by PD/RO
1	**Inception Report**	7 days
2	**Feasibility Study Report** i) Draft Feasibility Study Report including option study report including draft 3(a) report ii) Final feasibility Study report	 15days 7 days
3	**LA & Clearances Report** i) Draft LA & Clearances Report ii) Final LA & Clearances Report incorporating compliance of comments of Client	 15 days 7 days
4	**Detailed Project Report** i) Draft DPR ii) Final DPR incorporating compliance of comments of Client	 30 days 7 days
5	**Technical Schedules** i) Draft Technical Schedules ii) Final technical schedule	 30 days 7 days

The checklist for different stages of submission of report has been enclosed as under and the same shall be appended with proper references and page numbering. The checklist/s shall be appended with the report without which no payment shall be made.

ENCLOSURE- I B1

Daily Inspection Report in construction period Phase 3

Component	Item Description	Description of inspection work carried out	Results of lab tests conducted (Test conducted, Pass/Fail)	Name of key personnel inspecting the work
1. Road works including culverts, and minor bridges	Embankment/ Sub Grade/GSB/WMM/ DBM/BC			
2.MajorBridge works, Flyovers, ROB,RUB,VUP, PUP	Foundation/ Sub structure/ Super structure			
3. Approach to ROB/RUB/ Major Bridges/ Viaduct /	Foundation/ Sub structure/ Super structure			
4. Other Works				

ENCLOSURE- I B2

Daily Inspection Report in O&M period -Phase 3

Nature of defect/ deficiency	Defect found (Yes/No)	If defect found, Chainage &side	Compliance of previous defect (Yes/No/NA)	AE Remarks
ROADS				
Carriageway and paved shoulders				
Breach or blockade				
Pot holes				
Removal of debris				
Hard/earth shoulders, side slopes, drains and culverts				
Desilting of drains in urban/semi- urban areas				
Road side furniture including road signs and pavement marking				
Damage to shape or position;poor visibility or loss of retro-				
Street lighting and telecom (ATMS)				
Any major failure of the system				
Faults and minor failures				
Trees and Plantation				
Obstruction in a minimum head-room of 5m above carriageway or obstruction in visibility of				
Rest areas				
Cleaning of toilets				
Defects in electrical,waterand sanitary installations				
Toll plaza[s]				
Failure of toll collection equipment including ETC or				
Other Project Facilities and Approach roads				
Damage or deterioration in Approach Roads,-[pedestrian facilities, trucklay-bys, bus-bays, bus- shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works]				

ENCLOSURE- I B 3

Weekly Inspection Report in O&M period

Nature of defect or deficiency		Defect found (Yes/No)	If defect found, Chainage &side	Compliance of previous defect (Yes/No/NA)	AE Remarks
ROADS					
(a)	**Carriageway and paved shoulders**				
(i)	Breach or blockade				
(ii)	Roughness value exceeding 2,500mm in a stretch of 1 km (as measured by a standardised roughometer/bump integrator)				
(iii)	Pot holes				
(iv)	Cracking in more than 5% of road surface in a stretch of 1km				
(v)	Rutting exceeding10mm in more than 2% of road surface in a stretch of 1km (measured with 3m straight edge)				
(vi)	Bleeding/skidding				
(vii)	Ravelling/Stripping of bitumen surface exceeding 10 sq m				
(viii)	Damage to pavement edgesexceeding 10 cm				
(ix)	Removal of debris				
(b)	**Hard/earth shoulders,sideslopes,drain sand culverts**				
(i)	Variation by more than 2% in the prescribed slope of camber/crossfall				
(ii)	Edge drop at shoulders exceeding 40mm				
(iii)	Variation by more than15%in the prescribed side (embankment) slopes				
(iv)	Rain cuts/gullies in slope				

Nature of defect or deficiency		Defect found (Yes/No)	If defect found, Chainage &side	Compliance of previous defect (Yes/No/NA)	AE Remarks
(v)	Damage to or silting of culvert sand side drains during and immediately preceding the rainy season				
(vi)	Desilting of drains in urban/semi- urban areas				
(c)	**Roadside furniture including roadsigns and pavement marking**				
(i)	Damage to shape or position; poor visibility or loss of retro-reflectivity				
(d)	**Street lighting and telecom (ATMS)**				
(i)	Any major failure of the system				
(ii)	Faults and minor failures				
(e)	**Trees and plantation**				
(i)	Obstruction in a minimum head-room of 5m above carriageway or obstruction in visibility of				
(ii)	Deterioration in health of trees and bushes				
(iii)	Replacement of trees and bushes				
(iv)	Removal of vegetation affecting sight line and road structures				
(f)	**Rest areas**				
(i)	Cleaning of toilets				
(ii)	Defects in electrical,waterand sanitary installations				
(g)	**Toll plaza[s]**				
(i)	Failure of toll collection equipment including ETC or				
(ii)	Damage to toll plaza				
(h)	**Other Project Facilities and Approach roads**				

Nature of defect or deficiency		Defect found (Yes/No)	If defect found, Chainage &side	Compliance of previous defect (Yes/No/NA)	AE Remarks
(i)	Damage or deterioration in Approach Roads,-[pedestrian facilities, trucklay-bys, bus-bays, bus- shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works]				
BRIDGES					
(a)	**Superstructure of bridges**				
(i)	Cracks				
(ii)	Spalling/scaling				
(b)	**Foundations of bridges**				
(i)	Scouring and/or cavitation				
(c)	**Piers,abutments,return walls and wing walls of bridges**				
(i)	Cracks and damages including settlement and tilting				
(d)	**Bearings (metallic) of bridges**				
(i)	Deformation				
(e)	**Joints inbridges**				
(i)	Loosening and malfunctioning of joints				
(f)	**Other items relating to bridges**				
(i)	Deforming of pads in elastomeric bearings				
(ii)	Gathering of dirt in bearings and joints; or cloggingofspouts,weep holes and				
(iii)	Damage or deterioration in parapets and handrails				
(iv)	Rain-cuts or erosion of banks of the side slopes of approaches				
(v)	Damage to wearing coat				

Nature of defect or deficiency		Defect found (Yes/No)	If defect found, Chainage &side	Compliance of previous defect (Yes/No/NA)	AE Remarks
(vi)	Damage or deterioration in approach slabs, pitching, apron, toes, floor or guide bunds				
(vii)	Growth of vegetation affecting the structure or obstructing the waterway				

ENCLOSURE- I B 4

Month of survey for equipment based road condition assessment

Equipment based road inspection shall be done by the Authority's Engineer twice a year asper the month of the year defined in the following table.

However, since the first survey shall be conducted at the time of completion testing, the following modification to the schedule shall be adopted. For example, if majority of highway length (>50%) passes through a state, where defined survey months are May and November, if completion testing is conducted in April, then the first equipment based survey shall be conducted in the month of April. This shall be considered as the equipment based survey tobe conducted in the month of May. The 2nd equipment based survey shall be conducted in the month of November, the 3rd survey shall be conducted in the month of May and so on. As regards FWD, the first test/survey shall be conducted at the time of completion in April. The 2nd test/survey shall be conducted in April of next year and soon.

Region	State	Survey before rains	Survey after rains
East	Bihar	May	Nov
East	Chhattisgarh	May	Nov
East	Jharkhand	May	Nov
East	Orissa	May	Nov
East	West Bengal	May	Nov
Central	Madhya Pradesh	May	Nov
NE	Arunachal Pradesh	Mar	Oct
NE	Assam	Mar	Oct
NE	Manipur	Mar	Oct
NE	Meghalaya	Mar	Oct
NE	Mizoram	Mar	Oct
NE	Nagaland	Mar	Oct
NE	Sikkim	Mar	Oct
NE	Tripura	Mar	Oct
North	Chandigarh	May	Nov
North	Delhi	May	Nov
North	Haryana	May	Nov
North	Himachal	May	Nov

North	Jammu And Kashmir	May	Nov
North	Punjab	May	Nov
North	Uttar Pradesh	May	Nov
Region	**State**	**Survey before rains**	**Survey after rains**
North	Uttaranchal	May	Nov
South	Andaman And Nicobar Islands	Apr	Nov
South	Andhra Pradesh	Apr	Nov
South	Karnataka	Apr	Nov
South	Kerala	Apr	Nov
South	Pondicherry	Jun	Jan
South	Tamil Nadu	Jun	Jan
West	Dadar Nagar Haveli	Apr	Oct
West	Daman And Diu	Apr	Oct
West	Goa	May	Nov
West	Gujarat	Apr	Oct
West	Maharashtra	May	Nov
West	Rajasthan	Apr	Oct

ENCLOSURE- I B5

MONTHLY PROGRESS REPORT IN CONSTRUCTION PHASE

सड़क परिवहन और राजमार्ग मंत्रालय
MINISTRY OF ROAD TRANSPORT & HIGHWAYS
भारत सरकार Government of India

(PROJECT NAME)

CONSULTANCY SERVICES FOR PROJECT MANAGEMMET CONSULTANCY FOR SUPERVISION OF

[NAME OF CONSULTING FIRM]

MONTHLY PROGRESS REPORT NO.*[XX]* FOR THE MONTH OF: *Month,*

Year

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1 Executive Summary

1.1 Construction progress in current month

Key reporting metrics	Value/ %/ Amount
Scheduled Physical Progress (%)	
Cumulative Physical Progress upto current month (%)	
Physical Progress during current month (%)	
Financial progress (%)	
Cumulative Expenditure till date (Rs Cr)	
Tests passed as % of total tests witnessed by IE	
Tests passed as % of total tests conducted by IE	
Number of pending COS proposals	
Amount for pending COS (Rs Cr)	

1.2 Current issues and recommended actions by IE /AE

1. **Slow Progress of Structures: The progress of structures (especially, major bridges, flyovers and ROB's) is very slow. Overall progress is only XX%. Out of the total YY underpasses not even single underpass structure and its approaches is completed so far. No bridge is open to traffic so far.**

   a. ***Recommendation: Concessionaire should improve the progress of structures. Request for revised work plan from Concessionaire including specific activities on structures.***

2. Status of Change of Scope Proposals: Concessionaire has submitted *Xx No.* Change of Scope proposals. *Yy No.* of them are still pending for decision. Concessionaire has not submitted necessary clarifications /details for the following Changes of Scope in spite of several reminders.

   a. ***Recommendation:*** *Concessionaire to submit all pending clarifications to Authority. Authority and Concessionaire to expedite pending COS proposals.*

1.3 Strip Plan (Summary)

1. Work front Unavailable **& reason for Unavailability**

2. **Length completed by layer(MCW)**

3. **Length completed by layer(Service Road)**

	Length (km)	% Total Pending Length
Total Length	80	
Total Workfront Unavailable	7	12%
Pending Land Acq.	0	0%
Pending Clearances	7	12%
Encumbrances	0	0%

	Length (km)	% Total Length
Total Length	80	
Total Length Completed (Till DBM)	27.5	33%
BC	27	32%
DBM	27.5	33%
WMM	29.5	35%
GSB	32.5	39%
Sub-Grade	35	42%
C&G	47.9	57%

	Length (km)	% Total Length
Total Length	35	
Total Length Completed (Till DBM)	0	0%
BC	0	0%
DBM	0	0%
WMM	0	0%
GSB	0	0%
Sub-Grade	0	0%
C&G	0	0%

1.4 Strip Plan(Details)

Detailedreport

2 ProjectOverview

2.1 Salient Features ofProject

Project Name	
NH No. (New/ Old)	
Scheme/ Phase	
Mode of the Execution (BOTToll/BOTAnnuity/EPC/ HAM/ItemRate/Others)	
No. of Lanes/ Configuration	
Length of the Project (in Km)	
Total Project Cost (in Cr)	
No. of Bypasses (Name of Town, Length)	
No. of Major Bridges (Number and Location)	

No. of Toll Plazas (Number and Location)	
No. of Fly Overs (Number and Location)	
DPR Authority's EngineerName	
Lead & Consortium Members of Banks	
Concessionaire Name (SPV & Parent Company)	
Date of Award (LOA Date)	
Appointed Date	
Concession Period	
Construction Period (in Days)	
O&M Period (in Days)	
Scheduled Date of Completion	
Authority Engineer	
IE / AE Agreement Date	
IE / AE Mobilization Date	

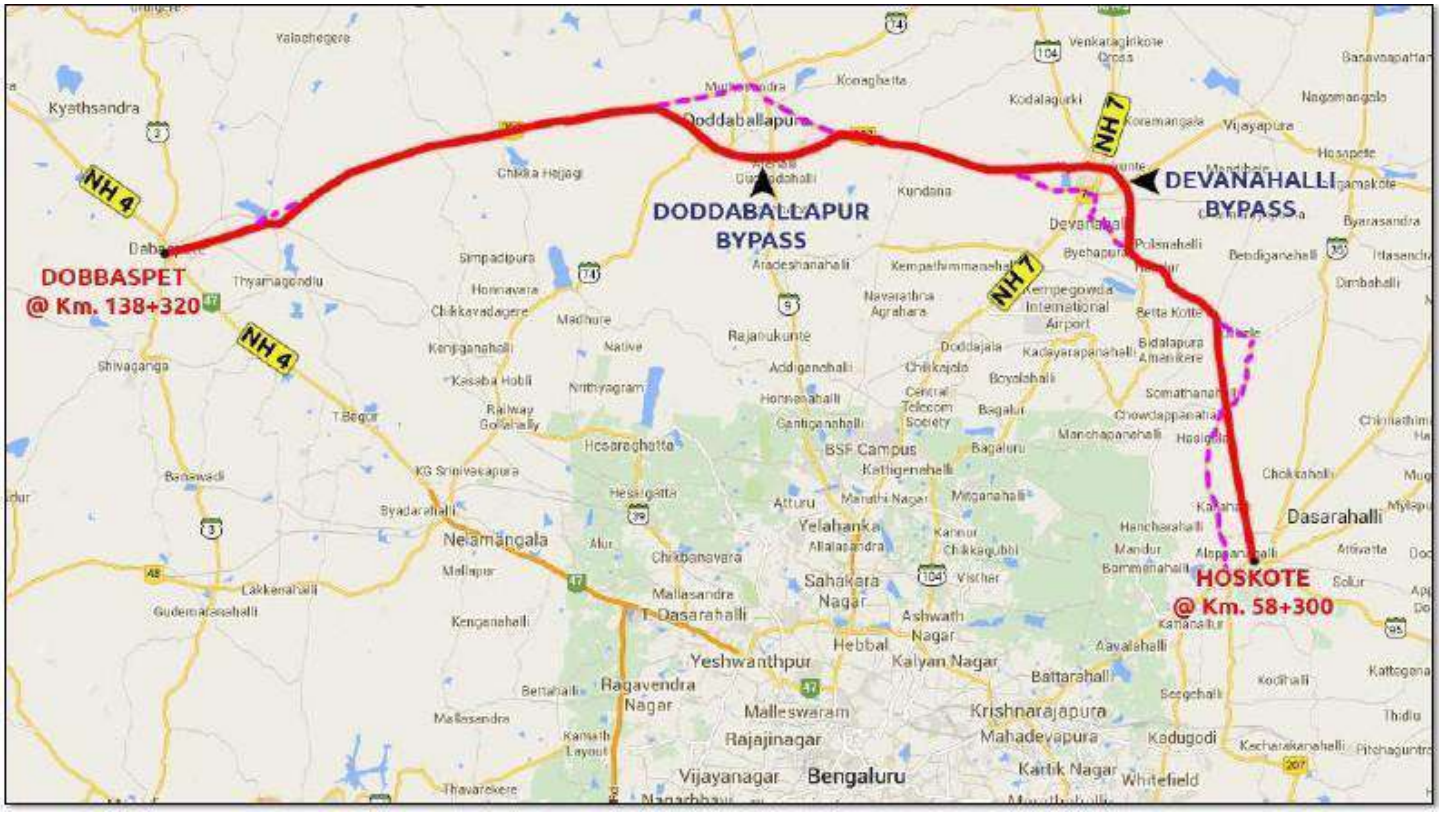
ALL FIGURES & GRAPHS IN TEMPLATES ARE ILLUSTRATIVE. PLEASE ADD ACTUAL DETAILS

2.2 ProjectMilestones

Project Milestone	Description (Days from Appointed Date)	Planned		Actual		Delay (No.of months)	Current Status
		Physical Progress (%)	Scheduled Date	Physical Progress (%)	Revised Date		
Milestone I	*[Description]*	25	*[DD/MM/YYYY]*	25	*[DD/MM/YYYY]*	5	Achieved
Milestone II	*[Description]*	65	*[DD/MM/YYYY]*		*[DD/MM/YYYY]*	22	Started, not achieved
Scheduled Completion	*[Description]*	100	*[DD/MM/YYYY]*		*[DD/MM/YYYY]*	21	Not started

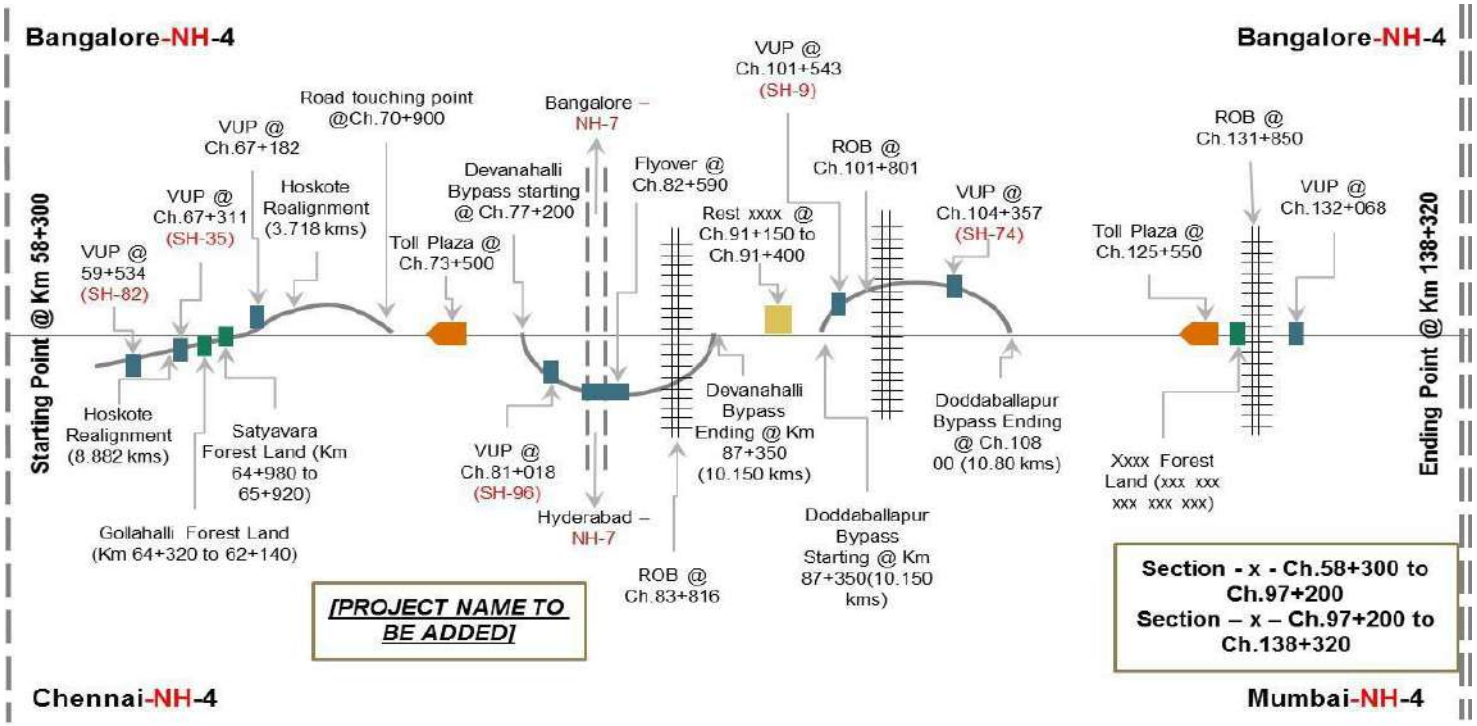
ALL FIGURES & GRAPHS IN TEMPLATES ARE ILLUSTRATIVE. PLEASE ADD ACTUAL DETAILS

2.3 Location Map



ALL FIGURES & GRAPHS IN TEMPLATES ARE ILLUSTRATIVE. PLEASE ADD ACTUAL DETAILS

2.4 Key Plan



[Above image is illustrative only. Please include chainage and name below the axis and list of features above the axis]

ALL FIGURES & GRAPHS IN TEMPLATES ARE ILLUSTRATIVE. PLEASE ADD ACTUAL DETAILS

3 Critical Issues & ActionLog

3.1 Pending Issues & ActionLog

S.No	Issue Description	Type	Ongoing/ New Issue/ Resolv	Concerned Authority	Chainage(s)affected due tothe issue	Length affected	Action(s) taken till now	Action(s) suggested by the AE	Expected date/ Actual Date for resolving
1	**Diversion of Xx ha of forest Land**	Clearance	**Ongoing Issue**	MoEF	*[Chainage]*	4 kms	*1.* Proposal submitted to MoEF Letter sent by RO to MoEF nodal *[DD/MM/YYY]*	Escalateto higherlevelofficers at MoEF	*[DD/MM/YYYY]*
							1. Escalated		

2	**21 Crcompensation disbursement pending**	Land Acquisition	**Resolved**	*[CALAName]*	*[Chainage]*	2.4 km	to chief secretary level through DO from Chairman/ *[DD/MM/YYY]*		*[DD/MM/YYYY]*
3	**Slow progress by concessionaire**	Concessionaire Issue	**New Issue**	*[Concess. Name]*	*[Chainage]*	57 km	None	Project Director to call higheru concessionaire	*[DD/MM/YYYY]*

3.2 Obligations as perContract

Expected Contents & Structure
Please write a summary of non-compliances of contractual obligations highlighting reasons for delay, stating pending actions and their potential risk to the project's progress and recommended actions by the IE. • ***Critical obligation sand constraints of concessionaire as percontract*** • ***Critical obligations of authority as percontract*** • ***Critical pending obligations of IE as percontract*** ***NOTE: Please include important issues requiring intervention of various parties, giving details and background wherever necessary***

ALL FIGURES & GRAPHS IN TEMPLATES ARE ILLUSTRATIVE. PLEASE ADD ACTUAL DETAILS

4 PhysicalProgress

Component	% Weightage	Physical Progress(During Current Month)	Physical Progress (Cumulative, Upto Current Month)
Road Works	35.00%	5%	15.0%
Major Bridge works and ROB / RUB	40.00%	1.20%	26.2%
Structures	21.00%	0.00%	0.8%
Other Works	4.00%	0.00%	0.0%
Physical Progress		2%	42.0%

ALL FIGURES & GRAPHS IN TEMPLATES ARE ILLUSTRATIVE. PLEASE ADD ACTUAL DETAILS

4.1 Detailed Scope of Work & Physical Progress by Component

Component	Cost Weightage in Project (%)	Item Description	Cost Weightage in Component (%)	Plannedin Scope(As perScope ofWork)	Progress till Date	%Physical Progress	Value of Physical Progress (7X4)
1	2	3	4	5	6	7	8
1. Road works including culverts, minor bridges, underpasses, overpasses, approaches to ROB/RUB/ Major Bridges/ Structures (but excluding service roads)	35.00%	1. C&G	5.00%	80 km	45 km	56%	2.8%
		2. Embankment	5.00%	80 km	40 km	50%	2.5%
		3. Sub Grade	5.00%	80 km	35 km	44%	2.2%
		4. GSB	5.00%	80 km	33 km	41%	2.1%
		5. WMM	5.00%	80 km	30 km	38%	1.9%
		6. DBM	5.00%	80 km	28 km	35%	1.8%
		7. BC	5.00%	80 km	27 km	34%	1.7%
2. Major Bridge works and ROB/RUB	40.00%	1. Major Bridges	10.00%	6 No	6 No	100%	10.0%
		2. Minor Bridges	5.00%	23 No	21 No	91%	4.6%
		3. Flyovers	5.00%	2 No	0	0%	0.0%
		4. ROB	5.00%	228 No	121 No	53%	2.7%
		5. VUP	5.00%	11 No	6 No	55%	2.7%

		6. PUP	5.00%	15 No	6 No	40%	2.0%
		7. RUB	5.00%	136 No	114 No	84%	4.2%
3. Structures (elevated sections, reinforced earth)	21.00%	1. Foundation	5.00%	35 km	2.2 km	6%	0.2%
		2. Sub-structure	5.00%	35 km	2.1 km	6%	0.2%
		3. Super-structure	5.00%	35 km	2.1 km	6%	0.2%
		4.ReinforcedEarth Wall	6.00%	35 km	2.1 km	6%	0.2%
4.OtherWorks	4.00%	1. Toll Plaza	4.00%	4 No	0	0%	0.0%
GRANDTOTAL			**100%**				**42.0%**

5 Land Acquisition andClearance

5.1 LASummary

Description	Total Required (ha)	Total in possessionat	Total to be acquired (ha)
Existing ROW	135.00	135.00	0.00
Pvt. Land To be Acquired	240.00	0.000	240.00
Public Land To be Transferred	52.00	50.35	1.65
Grand Total	**427**	**185**	**242**

ALL FIGURES & GRAPHS IN TEMPLATES ARE ILLUSTRATIVE. PLEASE ADD ACTUAL DETAILS

5.2 LA Detail byCALA

CALA	Total Landleft to be Acquired	3H Pend-ing(ha)	3HDone(ha)	3G Pend-ing (ha)	3GDone(ha)	3DPending (ha)	3DDone(ha)	3APending(Ha)	3ADone(ha)	Amount Awarded (Crore	Amount Deposited (Crore Rs.)	Amount Disbursed by CALA(Crore Rs.)	Pending Amount (Crore
CALA1]	150	15	15	15	135	0	150	0	150	396	370	327	43
[CALA2]	67	0	0	0	67	0	67	0	67	132	132	120	23
[CALA 3]	23	23	23	23	0	14	9	0	23	0	0	0	0
Grand	**240**	**38**	**20**	**38**	**20**	**14**	**226**	**0**	**240**	**528**	**502**	**447**	**66**

5.3 LA Detail by Village for each CALA1

Village	Total Landleft to be Acquired(Ha)	3H Pend-ing (ha)	3H Done (ha)	3G Pend-ing (ha)	3G Done (ha)	3D Pending (ha)	3D Done (ha)	3A Pending (Ha)	3A Done (ha)	Amount Awarded(Crore Rs.)	Amount Deposited (Crore Rs.)	Amount Disbursed by CALA (Rs Cr)	Pending Amount (Rs Cr)
[Village 1]	150	15	15	15	135	0	150	0	150	396	370	327	43
[Village 2]	67	0	0	0	67	0	67	0	67	132	132	120	23
[Village 3]	23	23	23	23	0	14	9	0	23	0	0	0	0
Grand Total	**240**	**38**	**202**	**38**	**202**	**14**	**226**	**0**	**240**	**528**	**502**	**447**	**66**

ALL FIGURES & GRAPHS IN TEMPLATES ARE ILLUSTRATIVE. PLEASE ADD ACTUAL DETAILS

5.4 Manpower details ofCALA

CALA	Provided by <Agency> / StateGov	Amins/ Surveyors	Patwaris / Village account	Revenue Inspectors/ Kanung	Tehsildars/ Dep. Tehsildars	Clerks / Sahayaks	Accountants	Computer operators	Peons	Chairman	Total
[CALA 1]	< Agency >	4	1	0	0	3	0	3	1	0	12
[CALA 1]	State Govt	2	0	2	0	0	0	1	0	0	5
[CALA 2]	< Agency >										
[CALA 2]	State Govt										
Grand Total											

5.5 ClearancesSummary

Environment				
Proposal Description	**Status**	**Length Impacted**	**Current Stage**	**Issues/ Comments**
Approval of construction in coastal zone	Obtained	Nil	Completed	
Forest Land				

Proposal Description	Status	Length Impacted	Current Stage	Issues/ Comments
Diversion of Xx ha (*[Chainage]*)	Pending	*[Length in km]*	Completed	Stage 1 clearance pending
Diversion of Xx Ha. (*[Chainage]*)	Obtained	Nil	Ongoing	

ALL FIGURES & GRAPHS IN TEMPLATES ARE ILLUSTRATIVE. PLEASE ADD ACTUAL DETAILS

Wildlife				
Proposal Description	**Status**	**Length Impacted**	**Current Stage**	**Issues/ Comments**
Diversion of Xx Ha. of forest land	Pending	*[Length inkm]*	Ongoing	Queries sent to MoEF by RO, compliance pending
TreeCutting				
Proposal Description	**Status**	**Length Impacted**	**Current Stage**	**Issues/ Comments**
N.A.	N.A.	N.A.	N.A.	N.A.
Railway (ROBs/RUBs)				
Proposal Description	**Status**	**Length Impacted**	**Current Stage**	**Issues/ Comments**
[GAD Number]	Proposal Submitted, Approval pending	*[Chainage]*	Uploaded on portal on *[DD/MM/YYYY]*	N.A.

5.6 Status of utilities shifting

Utility Category	Name	Status	Length affected	Department	Date of requestbyAuthority for estimate	Date when Estimate was Received from	Date of Approval by Authority RO/ HQ	Date of Deposit ofsuper-vision charge	Progress ofPhysical Shifting	Date of Certification from Agency for	Estimate Amount	Issue/ Comments
Water		**Estimate Approved**	*[Length in km]*	*[DEPARTMENT]*	*[DD/MM/YYYY]*	*[DD/MM/YYYY]*	*[DD/MM/YYYY]*	*[DD/MM/*	Not started	TBD		

Electric ity		**Estimate Approved**	*[Length in km]*	*[DEPARTMENT]*	*[DD/MM/YYYY]*	*[DD/MM/YYYY]*	*[DD/MM/YYYY]*	*[DD/MM/YYYY]*	Not started	TBD		
Others		**Estimate Approved**	*[Length in km]*	*[DEPARTMENT]*	*[DD/MM/YYYY]*	*[DD/MM/YYYY]*	*[DD/MM/YYYY]*	*[DD/MM/YYYY]*		TBD		

6 Change of Scope

S No.	Proposal Details	Date of first submission to AE	Current Status	COS Amount	ed/ Actual Date of Approval
1	Construction of *[Flyover Name]* at *[Chainage]*	*[DD/MM/YYYY]*	Approved in principle by Authority. Detailed quantities in proper order yet to be	*[+/- Amount]*	*[DD/MM/YYYY]*
2	Nallah diversion through box culvert at*[Chainage]*	*[DD/MM/YYYY]*	Clarifications to be submitted by Concessionaire , expected	*[+/- Amount]*	*[DD/MM/YYYY]*

7 Mobilization of Resources

S No.	Equipment Name	Make	Model	Age of Equipment	Planned/ Required Quantity	Actual Quantity	DeployedDuringtheMonth	Reason(s) for Under/Over Mobilization	Expected DelayduetoUnder-Mobilization	Remarks
	Excavator/ Poclain					5				
	Paver					2				
	Transit Meter					0				
	Plate Compactors					0				
	[ADD OTHERS]									

8 Financial Progress Details (for PPPprojects)

8.1 Pen Picture -Escrow

TPC (Cr)	Cumulative inflow to Escrow till previous month (Cr)	Cumulative outflow from Escrow till previous month(Cr)	Inflow to Escrow during the month(Cr)	Outflow from Escrow during the month(Cr)
1,206	1,033	900	30	35

Are the Escrow withdrawals in accordance with the order of withdrawal as specified in the Concession Agreement?

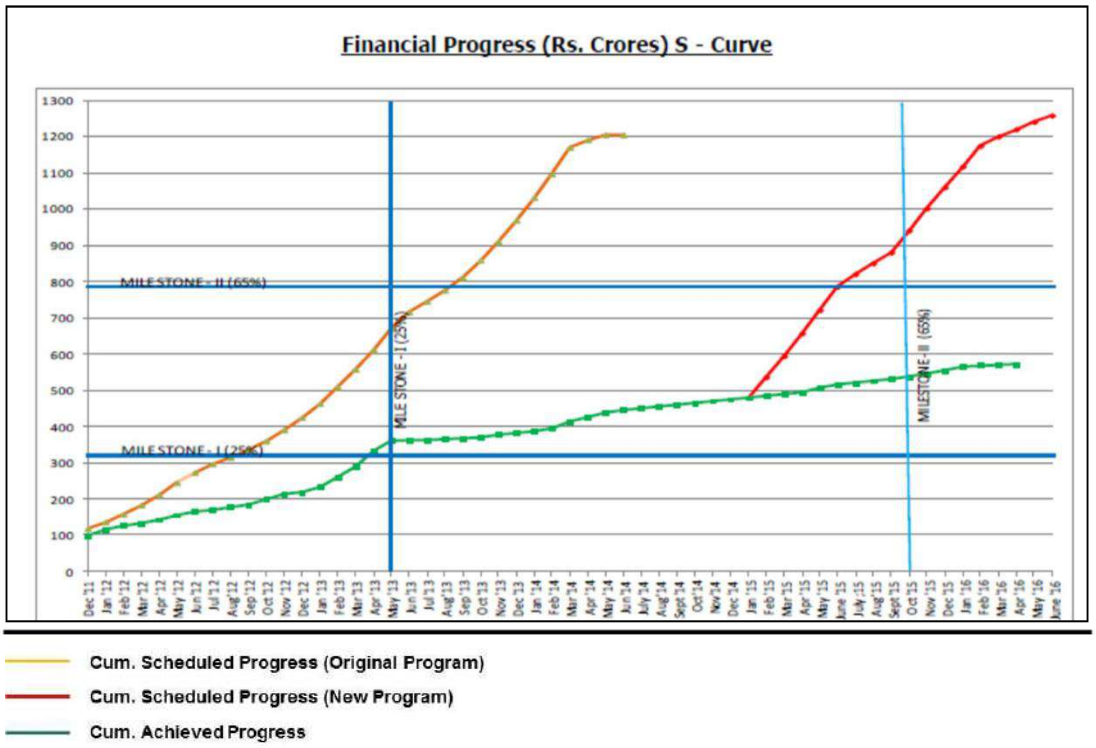
Tick as applicable

If not, details to be provided below:

ALL FIGURES & GRAPHS IN TEMPLATES ARE ILLUSTRATIVE. PLEASE ADD ACTUAL DETAILS

8.2 Escrow details

TPC (Cr)	Cumulative exp. till date (Cr)	EscrowPlan tilldate-Debt(BOT) (Cr)	EscrowPlan till date-Equity(BOT)(Cr)	EscrowPlan till date-VGF (BOT)(Cr)	Escrow Actual till date-Debt(BO	EscrowActual tilldate-Equity(BOT)(Cr)	Escrow Actualtill date-VGF (BOT)(Cr
1,206	1,033	900	306	-	769	264	-



PLEASE EXCLUDE OUTSTANDING MOBILIZATION FEE/ ADVANCE IN S-CURVE

9 Summary of quality controltests

9.1 Tests witnessed by IE/AE

Description	Frequency of tests		Unit	Total test up toPrevious Month			Total test in This Month			Cumulative No. of tests			Remarks
	No.	Qty.		Conducted	Pass	Fail	Conducted	Pass	Fail	Conducted	Pass	Fail	
Sub grade													
Procter test	1	150	m3	0	0	0	0	0	0	0	0	0	
Atterberg Limits	1	150	m3	0	0	0	0	0	0	0	0	0	
Free SwellInde	1	150	m3	0	0	0	0	0	0	0	0	0	
Grain SizeAnalysi	1	150	m3	0	0	0	0	0	0	0	0	0	
C.B.R	1	300	m3	0	0	0	0	0	0	0	0	0	

Granular Sub Base													
Gradation	1	200	m3	151	151	0	5	5	0	156	156	0	
Atterberg Limits	1	200	m3	151	136	15	5	5	0	151	136	15	
Procter test	1	150	m3	0	0	0	0	0	0	0	0	0	
Wet Mix Macadam													
Filter material													
Concrete													
Cement													
Water													
Prime Coat													
Tack coat													
Dense Bituminous Macadam													
Bituminous Concrete													
Bitumen test													
DLC													
Steel													

9.2 Tests conducted by IE /AE

<Quality inspection test results to be reported in a table similar to the table provided in previous section>

ALL FIGURES & GRAPHS IN TEMPLATES ARE ILLUSTRATIVE. PLEASE ADD ACTUAL DETAILS

10 Monitoring of maintenance obligations during construction phase

10.1 Critical issues and actionlog

SNo	IssueDescription	Ongoing/New Issue	Concerned Authority	Chainage(s) affecteddueto theissue	Lengthaffected (km)	Action(s)taken tillnow	Action(s) suggestedbySC	ExpectedDatefor resolvingissue
1	Drying up of plants on median	Ongoing	Concessionair e	*325+200 to 327+800*	2.6	Irregular watering	Replacemen t of plants and daily watering	NA
2	Large potholes	New	Concessionair e	*387+300 LHS*	0.1	None	Filling of potholes	<DD/M M>

10.2 Summary of repair work

SNo	Description	Unit	Total	Work done upto previous month	Work done during reporting month	Balance	Remarks
1	**Carriageway and paved shoulders**						
(a)	Pot Holes	Sqm	42	-	-	42	
(b)	Roughness value exceeding 2,500mm	mm					
(c)	Cracking in more than 5% of road surface	Sqm	7179	-	-	7179	
(d)	Rutting exceeding 10mm in more than 2% of road surface	Sqm	5	-	-	5	
(e)	Bleeding/Skiding	Sqm					
(f)	Ravelling	Sqm					
(g)	Damage to pavement edges exceeding 10cm	m					
2	**Hard/Earth Shoulders**						
SNo	**Description**	**Unit**	**Total**	**Work done upto previous month**	**Work done during reporting month**	**Balance**	**Remarks**

(a)	Rain cuts/ gullies in slope	Cum	650	25	-	625	
(b)	Edge drop at shoulders exceeding 40 mm	m					
3	**Drains and culverts**						
(a)	Cleaning of Culvert	Nos	1	-	-	1	
(b)	Damage to or silting ofculverts						
(c)	Silting of drains in urban/ semi urban areas						
4	**Road furniture**						
(a)	Sign Boards	Nos	456	-	-	456	
(b)	Kilometer Stones						
(c)	Metal Beam Crash Barrier						
(d)	Bus Shelters	Nos	72	4	-	68	
(e)	Junction signs	Nos	26	8	-	18	
(f)	Median Grills	Rmt	894	-	-	894	
(g)	Studs	Nos	5328	-	-	5328	
(h)	Delinators	Nos	8236	-	-	8236	
(i)	Road Marking	Sqm	1899	-	-	1899	
(j)	Kerb Painting	Sqm	4575	-	-	4575	
(k)	Guard Posts	Nos	3657	-	-	3657	
5	**Street lighting and telecom (ATMS)**						
(a)	Street lights	Nos					
(b)	Telecom	Nos					
6	**Trees and plantation**						
(a)	Removalofvegetationa ffectingsightlineand roadstructures	Ha	77.42	-	3.57	73.85	
(b)	Replacement of trees and bushes	Nos	15072	-	-	15072	

SNo	Description	Unit	Total	Work done upto previous month	Work done during reporting month	Balance	Remarks
7	**Buildings and bridges**						

(a)	Rest areas						
(b)	Toll plazas						
(c)	Bridges						

Status of damages

SNo	Period	Amount of damages (Rs)
1	Upto June 2016	
2	Jul 2016	
3	Aug 2016	
4	Sep 2016	
	Total	

11 Safety features

11.1 Pen picture of safety features

Details to be provided after assessment of the site requirement vis-à-vis provisions in the Concession Agreement:

Location of Black Spots	Suggested Remedial Measures within provisions of Concession Agreement	Additional Remedial Measures (if any)	Financial implications of additional Remedial Measures for Authority(Cr.)

11.2 Accident Report

		1	S No	
		1/1/17	Date	
		382/050	Chainage no	
		05:25 pm	Time of accident	
		M	Sex (M/F)	
		2	Accident location	A
		2	Nature of accident	B
		3	Classification of	C
		4	Causes	D
		1	Load conditions of	E
		1	Road condition	F
		-	Intersection type of	G
		1	Weather condition	H
		3	Age of victim	I
		1	Type of victim	J
		3	Type of vehicle	K
		-	Fatal	No of affected persons
		1	Major	
		1	Mino	
		Ambu	Help provided by	

Mapping of report fields to responses

A	1. Urban 2. Rural
B	1.Overturned 2.Head On Collision 3.Hit from Back 4. Hit to Fix Object 5. Right turn Collision 6. Leftturn Collision 7. Veered Out off The Road 8. Hit Pedestrian 9. Unknown/Hit & Ran Away
C	1. Fatal 2. Major injury 3. Minor injury
D	1. Drunken 2. Over Speeding 3. Vehicle out of Control 4. Driven on wrong side 5. Mechanical Problem
E	1. Normally Loaded 2. Overloaded/Handing 3. Empty 4. Unknown
F	1. Straight road 2. Slight Curve 3. Sharp Curve 4. Hump 5. Dip
G	1. T-Junction 2. Y-Junction 3. Four arm Junction 4. Staggered Junction 5. Junction with more than
H	1. Fine/Clear 2. Mist/Fog 3. Cloudy 4. Light Rain 5. Heavy Rain 6. Strong Wind 7. Dust Storm 8. Cold 9. Hot
I	1. 0-18 Years 2. 18-25 Years 3. 25-40 Years 4.40-60 Years 5. 60-80 Years
J	1. Driver 2. Passenger 3. Pedestrian 4. Cyclist 5. Others
K	1. Two Wheeler 2. Auto Rickshaw 3. Car/Jeep 4. Bus 5. Light Truck 6. HeavyTruck 7.Tractor 8. Bicycle 9. Cycle Rickshaw 10. Hand Drawn Cart 11. Animal Drawn Cart

Annexure 1. Detailed List of Physical Components as per Schedule G

Component	Physical Item
Road works including culverts, minor bridges, underpasses, overpasses, approaches to ROB/RUB/ Major Bridges/ Structures (but excluding service roads)	**A- Widening and strengthening of existing road**
	(1) Earthwork up to top of the sub-grade
	(2) Granular work (sub- base, base, shoulders)
	(a) GSB
	(b) WMM
	(3) Shoulders
	(4) Bituminous work
	(a) DBM
	(b) BC
	(5) Rigid Pavement
	Concrete work
	(6) Widening and repair of culverts
	(7) Widening and repair of minor bridges
	B- New realignment/bypass
	(1) Earthwork up to top of the sub-grade
	(2) Granular work (sub- base, base, shoulders)
	(a) GSB
	(b) WMM
	(3) Shoulders
	(4) Bituminous work
	(a) DBM
	(b) BC
	(5) Rigid Pavement
	Concrete work
	C-New culverts,minor bridges, underpasses, overpasses on existing road, realignments, bypasses:
	(1) Culverts
	(2) Minor bridges
	(a) Foundation
	(b) Sub-structure
	(c) Super-structure (including crash barriers etc. complete)
	(3) Cattle/Pedestrian underpasses
	(a) Foundation
	(b) Sub-structure
	(c) Super-structure (including crash barriers etc. complete)
	(4) Pedestrian overpasses
	(a) Foundation
	(b) Sub-structure
	(c) Super-structure (including crash barriers etc. complete)
	(5) Grade separated structures
	(a) Underpasses

Component	Physical Item
	(i) Foundation
	(ii) Sub-structure
	(iii) Super-structure (including crash barriers etc. complete)
	(b) Overpass
	(i) Foundation
	(ii) Sub-structure
	(iii) Super-structure(including crash barriers etc. complete)
	(c) Flyover
	(i) Foundation
	(ii) Sub-structure
	(iii) Super-structure(including crash barriers etc. complete)
	(d) Foot over Bridge
Major Bridge works and ROB/RUB	**A- Widening and repairs of Major Bridges**
	(1) Foundation
	(a) Open Foundation
	(b) Pile Foundation/Well Foundation
	(2) Sub-structure
	(3) Super-structure (including crash barriers etc. complete)
	B- Widening and repair of
	(a) ROB
	(1) Foundation
	(2) Sub-structure
	(3) Super-structure (including crash barriers etc. complete)
	(b) RUB
	(1) Foundation
	(2) Sub-structure
	(3) Super-structure (including crash barriers etc. complete)
	C- New Major Bridges
	(1) Foundation
	(a) Open Foundation
	(b) Pile Foundation/Well Foundation
	(2) Sub-structure
	(3) Super-structure (including crash barriers etc. complete)
	D- New rail-road bridges
	(a) ROB
	(1) Foundation
	(2) Sub-structure
	(3) Super-structure (including crash barriers etc. complete)
	(b) RUB
	(1) Foundation
	(2) Sub-structure
	(3) Super-structure (including crash barriers etc. complete)
Structures (elevated sections, reinforced earth)	**(1) Foundation**
	(2) Sub-structure
	(3) Super-structure (including crash barriers etc. complete)

Component	Physical Item
	(4)Reinforced Earth Wall (includes Approaches of ROB, Underpasses, Overpasses, Flyover etc.
Other Works	**(i) Service roads/ Slip Roads**
	(ii) Toll Plaza
	(iii) Road side drains
	(iv) Road signs, markings, km stones, safety devices, ...
	(a)Road signs, markings, km stones, ...
	(b) Concrete Crash Barrier/ W-Beam Crash Barrier in Road work
	(v) Project facilities
	(a) Bus bays
	(b) Truck lay-byes
	(c) Rest areas
	(vi) Repairs to bridges/structures
	(vii) Road side plantation
	(viii) Protection works
	(a) Boulder Pitching on slopes
	(b) Toe/Retaining wall
	(ix) Tunnel
	(a) Excavation
	(b) Construction of support systemincluding rock bolting, lining etc.
	(c) On complete completion of tunnel
	(x) Miscellaneous

* The above list is illustrative and may require modification as per the actual scope of the work

Annexure 2. Onwards

IE **/ AE** should include comments, status update, data points and reports in following Annexures which have not been included elsewhere in the main report. Such reports may include but not limited to:

- Review status of drawings/ designreports
- Review status of other documents
- Minutes of reviewmeeting
- Detailed Inspection report of projecthighway
- Correspondence details
- Weatherreport
- Organizational chart of Concessionaire / Contractor and IE /AE
- List of labequipment
- Details of usercomplaints
- Project photographs

ENCLOSURE-I B 6

MONTHLY STATUS REPORT IN CONSTRUCTION PHASE

सड़क परिवहन और राजमार्ग मंत्रालय
MINISTRY OF ROAD TRANSPORT & HIGHWAYS
भारत सरकार Government of India

(Project Name)

CONSULTANCY SERVICES FOR PROJECT MANAGEMNT CONSULTANCY FOR SUPERVISION OF

[NAME OF CONSULTING FIRM]

MONTHLY STATUS REPORT NO.*[XX]*

FOR THE MONTH OF: *Month, Year*

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3

1 Executive Summary

1.1 Overall road condition

Road condition	LHS	RHS
Satisfactory road condition	40 km	20 km
Poor road condition	50 km	70 km
Total length of project	**90 km**	**90 km**

1.2 Key reporting metrics

Key metrics	Value/Amount
No of pending NCRs	35
Damages amount recommended on Concessionaire (Rs Cr)	Rs 5.9 Cr
No of pending Change of Scope proposals	2
No of pending disputes	2
Monthly toll collection (Rs Cr) *(If applicable)*	Rs 3.8 Cr
No of accidents	12
No of encroachments	47

1.3 Key maintenance activities undertaken

Asset	Maintenance activities undertaken
Pavement	• Concessionaire has commenced the work for renewal and repair of pavement on the project highway w.e.f 14th September 2016
Shoulder	
Drainage	• Cleaning of drainage in builtup areas n progress
Median	
Road furniture	• Concessionaire has taken up repairs and maintenance of MBCB and electric poles,etc on issuance of NCPs from Authority Engineer
Bridges	
Buildings	• As per provisions of CA and policy decided by MoRTH/<Agency>, 2 ETC lanes at each toll plaza have been operationalised w.e.f. 25th September 2016. The connectivity of ETC lanes with Central Clearing House (CCH) has been achieved and presently ETC lanes are operationalized in Hybrid Mode due to less number of tags purchased by highway users
Horticulture	• Planting of new trees from Chainage 200+300 to 226+650 • Trimming of plants which were causing obstruction to highway users

1.4 Pending issues

- Overlay on the entire stretch of project length of 252 km and service roads has not been taken up by Concessionaire yet since the date of completion of overlay is due

in next 25 days

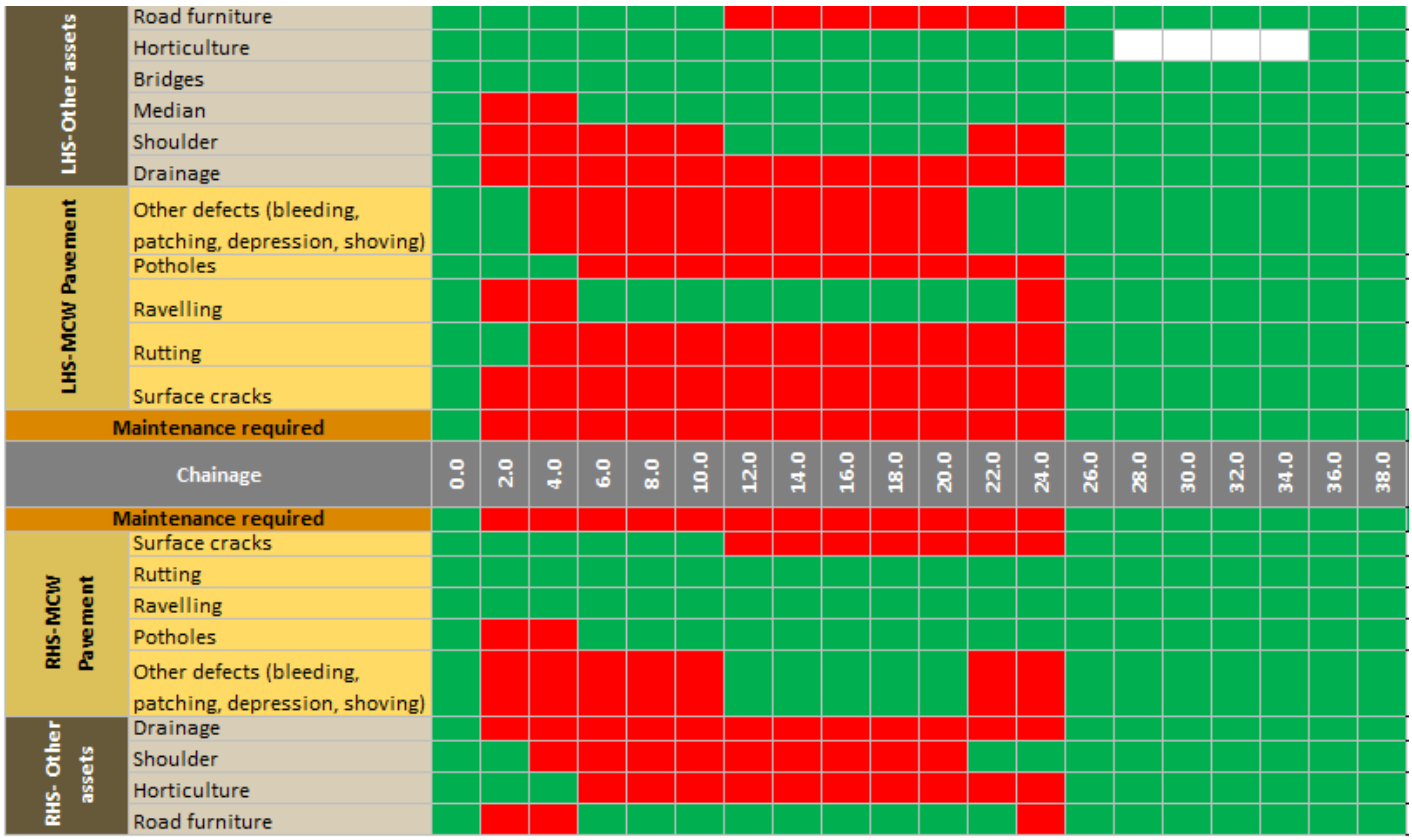
- Over all progress is very slow regarding repair of potholes and rutting on Main Carriageway which is causing inconvenience to highway users and is also a concern from road safety point of view.
- Street lighting in
  - **Anantapur bypass** completed on main carriageway and is energized but for service roads street lighting is pending on bothsides
  - **Kurnool bypass** erection of poles only completed in main carriageway not yet energized till to date, but for service roads not started

1.5 Recommended actions by Authority Engineer

- In spite of the repeated requests, there is no material change in status of works pertaining to repairs/ rectifications of defects on the project highway. AE has recommended the damages of Rs 5.9 Cr on the Concessionaire on account of delay in repairs of defects in road and bridge works in terms of the provision of Clause 15.8.1 of the Concession Agreement. Concessionaire shall be liable for imposition of further damages on similar lines till the date of completion
- Concessionaire is requested to take at most care for completing the overlay before 31.03.2017 since the existing road condition is getting deteriorated day by day causing much inconvenience to the traffic

All figures and graphs in templates are illustrative. Please add actual details.

1.6 Strip Plan for maintenance



Satisfactory road condition (Maintenance not	
Poor road condition (Maintenance required)	

All figures and graphs in templates are illustrative. Please add actual details.

Main report

2 Project Overview

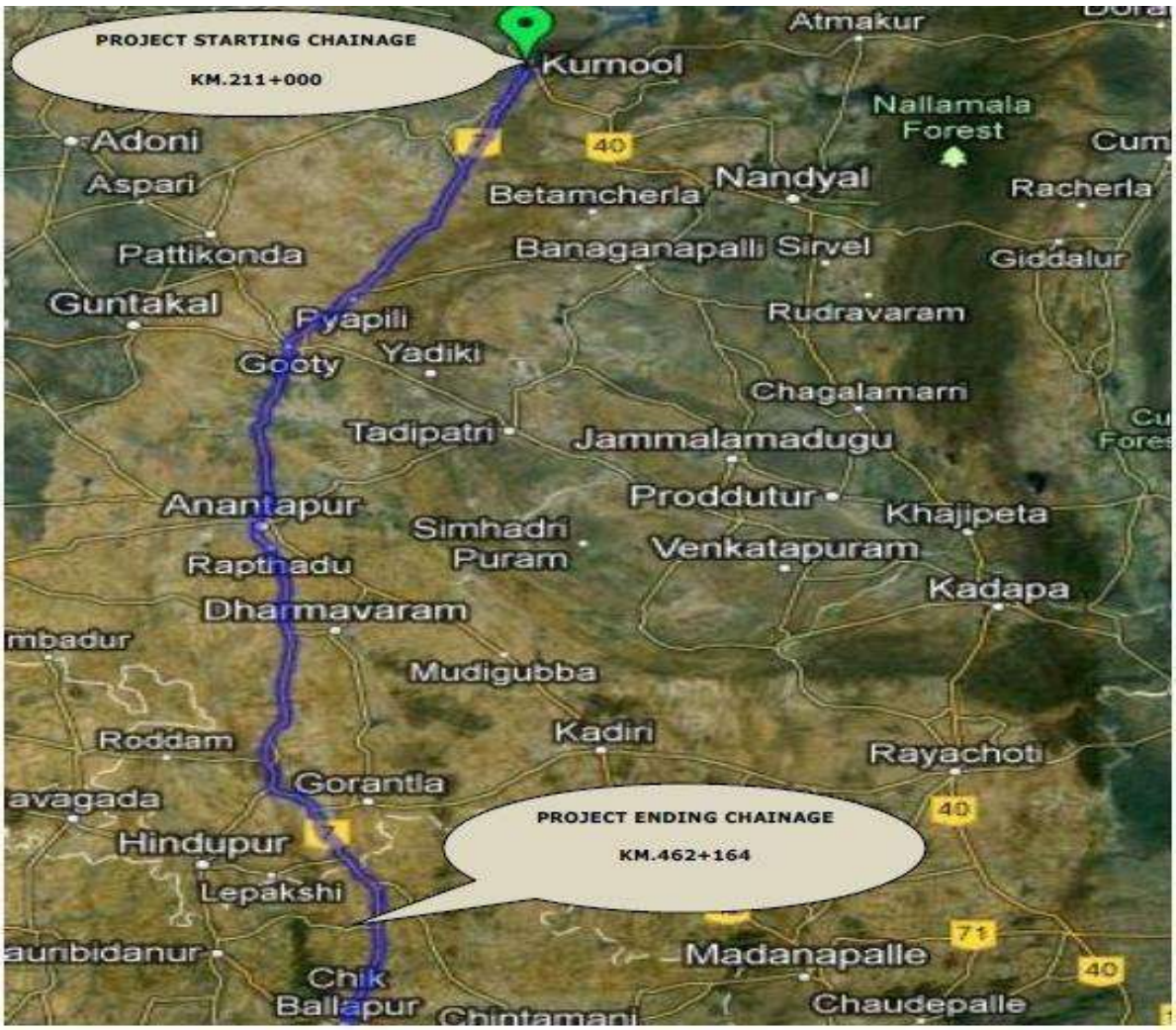
2.1 Key project details

Project Name	
NH no (New/Old)	
Mode of the Project	
No. of Lanes	
Length of the Project	
Total Project Cost	
Concessionaire/ Contractor	
Date of Award (LOA date)	
Appointed Date	
Commercial Operation Date (COD)	
Concession Period	

O&M Period	
Authority Engineer	
AE Agreement Date	
AE Mobilization Date	
AE Scheduled Completion Date	
AE EOT (Extension Of Time)	

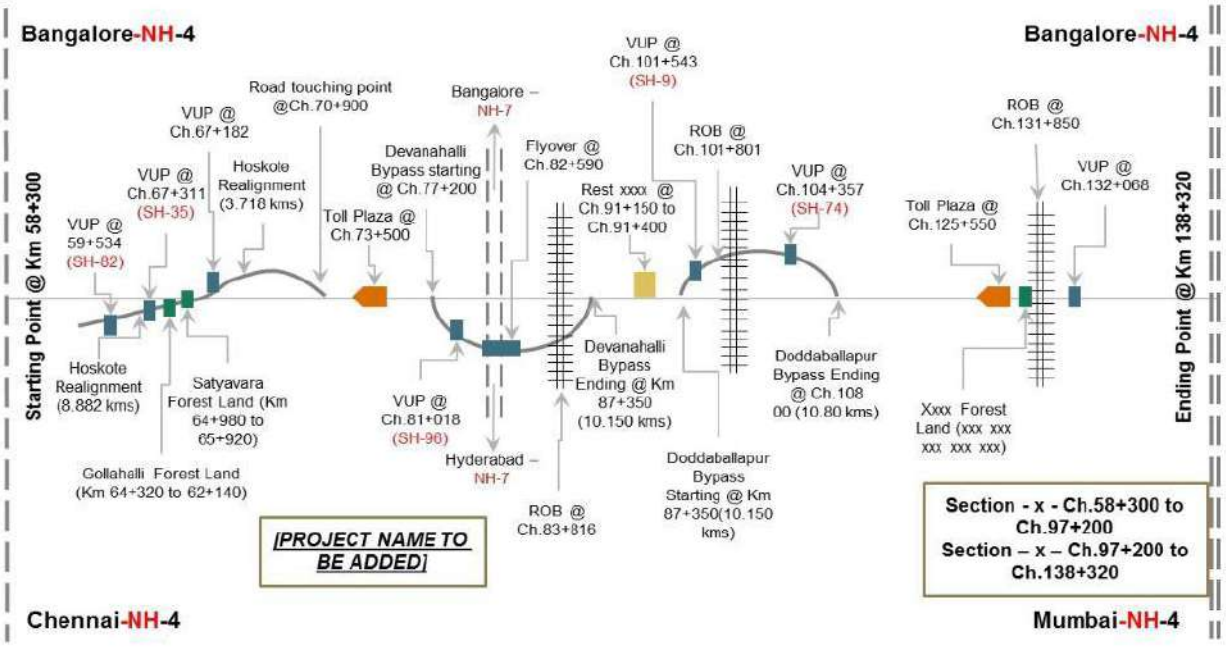
All figures and graphs in templates are illustrative. Please add actual details.

2.2 Location Map



All figures and graphs in templates are illustrative. Please add actual details.

2.3 Keyplan



RoW availability

Width of RoW available on both sides of the highway

LHS-WidthofRoWavailable	>2																			
	20																			
	18																			
	16								16	16	16	16	1	1	1					
	14																			
	12																			
	10																			
	8			8.2	8.2	8.2	8.2	8.2												
	6																			
	4															4.	4.	4.	4.	4.
	2	1.	1.																	
Chaina																				
RHS-WidthofRoWavailable	2																			
	4																			
	6											6.	6.	6.	6.	6.	6.			
	8																			
	10	1	10																	
	12																			
	14																			
	16																			
	18			17.	17.	17.	17.	17.	17.	17.	17.									
	20																			
	>2																	2	2	25

All figures and graphs in templates are illustrative. Please add actual details.

2.5 Summary of project features

SNo	Particulars	Value
1	No of flyovers	2
2	Service Road	45
3	ROBs	5
4	ROB location (chainage)	261.975, 299.606, 350.547, 396.135 & 420.302
5	RUBs	0
6	RUB location (chainage)	NA
7	No of Bypass	7
8	Length of Bypass	43
9	No of Major Bridges	7
10	No of Minor Bridges	67
11	No of Culvert	640
12	No of VUP	16
13	No of PUP/ Cattle Underpass	12
14	No of Major Intersection/ Junction	22
15	No of Toll Plaza	3
16	Location of Toll Plaza (chainage)	
17	No of Truck Laybye	30
18	No of Bus Bays	122
19	No of Wayside Amenities	0
20	Location of Wayside Amenities (chainage)	NA

All figures and graphs in templates are illustrative. Please add actual details.

3 Critical Issues and Action taken

3.1 Issue and actionlog

SNo	IssueDescription	Ongoing/New Issue	Concerned Authority	Chainage(s) affected due to the issue	Length affected (km)	Action(s) taken till now	Action(s) suggested by SC	Expected Date for resolving issue

1	Drying upof plants on median	Ongoing	Concession aire	*325+200 to 327+800*	2.6	Irregular watering	Replacement of plants and daily watering	NA
2	Large potholes	New	Concession aire	*387+300 LHS*	0.1	None	Filling of potholes	<DD/MM>

All figures and graphs in templates are illustrative. Please add actual details.

3.2 Summary of items (Cumulative Observations/Deficiencies)

SNo	Description	Unit	Total	Work doneupto previous month	Work donedurin g reporting month	Balance	Remarks
1	**Carriageway and paved shoulders**						
(a)	Pot Holes	Sqm	42	-	-	42	
(b)	Roughness value exceeding 2,500mm	mm					
(c)	Cracking in more than 5% of road surface	Sqm	7179	-	-	7179	
(d)	Rutting exceeding 10mm in more than 2% of road surface	Sqm	5	-	-	5	
(e)	Bleeding/Skiding	Sqm					
(f)	Ravelling	Sqm					
(g)	Damage to pavement edges exceeding 10cm	m					
2	**Hard/Earth Shoulders**						
(a)	Rain cuts/ gullies in slope	Cum	650	25	-	625	

SNo	Description	Unit	Total	Work done upto previous month	Work done during reporting month	Balance	Remarks
(b)	Edge drop at shoulders exceeding 40 mm	m					
3	**Drains and culverts**						
(a)	Cleaning of Culvert	Nos	1	-	-	1	
(b)	Damage to or silting of culverts						
(c)	Silting of drains in urban/ semi urban areas						

4	**Road furniture**						
(a)	Sign Boards	Nos	456	-	-	456	
(b)	Kilometer Stones						
(c)	Metal Beam Crash Barrier						
(d)	Bus Shelters	Nos	72	4	-	68	
(e)	Junction signs	Nos	26	8	-	18	
(f)	Median Grills	Rmt	894	-	-	894	
(g)	Studs	Nos	5328	-	-	5328	
(h)	Delinators	Nos	8236	-	-	8236	
(i)	Road Marking	Sqm	1899	-	-	1899	
(j)	Kerb Painting	Sqm	4575	-	-	4575	
(k)	Guard Posts	Nos	3657	-	-	3657	
5	**Street lighting and telecom (ATMS)**						
(a)	Street lights	Nos					
(b)	Telecom	Nos					
6	**Trees and plantation**						
(a)	Removal of vegetation affecting sightline and road structures	Ha	77.42	-	3.57	73.85	
(b)	Replacement of trees and bushes	Nos	15072	-	-	15072	
7	**Buildings and bridges**						
(a)	Rest areas						
(b)	Toll plazas						
(c)	Bridges						

3.3 Obligations as per contract

Please write a summary of contractual obligations of Concessionaire and non-compliances of critical obligations highlighting reasons for delay and stating pending actions

- *Critical obligations of Concessionaire as per contract*

- **Non compliances of critical contractual obligations**

3. 4 Major maintenance and Inspection schedule

Item	Responsibility	Last completed on	Due date
Major maintenance	Concessionaire	*[DD/MM/YY]*	*[DD/MM/YY]*
Periodic overlay	Concessionaire	*[DD/MM/YY]*	*[DD/MM/YY]*
Pavement inspection using NSV	Authority Engineer	*[DD/MM/YY]*	*[DD/MM/YY]*
Roughness using Laser Profilometer	Authority Engineer	*[DD/MM/YY]*	*[DD/MM/YY]*
Pavement strength using FWD	Authority Engineer	*[DD/MM/YY]*	*[DD/MM/YY]*
Bridge inspection using MBIU	Authority Engineer	*[DD/MM/YY]*	*[DD/MM/YY]*
Road sign inspection using Reflectometer	Authority Engineer	*[DD/MM/YY]*	*[DD/MM/YY]*
Other			

All figures and graphs in templates are illustrative. Please add actual details.

4 InspectionReport

4.1 Summary of NCR issued

SNo	Highway asset	Total NCR issuedtill previous month (A)	NCR issued in reporting month (B)	NCR closed in reporting month (C)	Balance NCR (A+B-C)
1	Pavement	48	12	25	35
2	Shoulder	7	0	3	4
3	Drainage				
4	Median				
5	Road furniture				
6	Bridges				
7	Buildings				
8	Horticulture				
9	*[Other assets]*				
	Total				

4.2 Equipment based inspection report

				Pavement	Surfac	eDefe	cts		Roughness	Pavem	ent Str	ength
0.000	0.500	L1	2X10	20X352.5X1.2	4X12	25	1.4		4.23	7110	34	14
0.500	1.000	L1	3X5	10X151.5X0.8	3X10	24	1.8		2.68	7430	36	15
1.000	1.500	L1										

Report of equipment based inspection needs be provided as an Annexure to monthly report as per the defined frequency. Following documents/media to be submitted for equipment based inspection.

- Video footage of all cameras installed on Network Survey Vehicle- ROW cameras and pavement camera
- Network Survey Vehicle report capturing dimensions of following key metrics of pavement
  - Cracks
  - Potholes
  - Raveling
  - Bleeding
  - Rutting
  - Texture depth
  - Skid resistance
  - Roughness(IRI)
- Falling Weight Deflectometer (FWD) report capturing following key metrics of pavement strength
  - Deflection Bowl (Transient Deflections at seven different points)
  - Corrected Elastic Modulus Bituminous E1
  - Corrected Elastic Modulus Granular E2
  - Corrected Elastic Modulus Subgrade E3
  - Subgrade CBR
  - Bituminous layer coefficient A1
  - Base layer coefficient A2
  - Granular base layer coefficient A3
  - Modified structural number
- Mobile Bridge Inspection Report (MBIU) capturing following key metrics of bridges

- Condition Approach
- Condition Signs
- Condition Debris
- Condition Joint
- Condition Deck
- Condition Rails
- Condition Protect
- Condition Stream
- Condition Superstructure
- Condition Piers
- Condition Abutment

- Retro reflectometer report capturing following key metrics of road furniture
  - Coefficient of retroreflected luminance RA (night time retroreflection) of road traffic signs

All figures and graphs in templates are illustrative. Please add actual details.

5 Monitoring of ETClanes

5.1 Monthly ETC Report

TYPE OF VEHICLE			For Corresponding month of previous year		For Previous Month		For Current Month		
			No of vehicles	Fee Collected	No of vehicles	Fee Collected	Fee per vehicle	No of vehicles	Fee Collected
A	Car	Total	3845	384500	4659	465,900.00	100	4289	428,900.00
B	LCV	Total	1521	243360	1312	209,920.00	160	1399	223,840.00
C	Bus	Total	2404	793386	2284	765,207.00	201	2349	786,915.00
D	Truck	Total	1603	528924	1523	510,138.00	134	1566	524,610.00
E	3 Axle	Total	18990	6836400	16310	5,953,150.00	365	15127	5,521,355.00
F	MAV	Total	16119	8381880	21111	11,188,830.00	530	18790	9,958,700.00
G	Over Size	Total	1	630	27	17,280.00	640	36	23,040.00
	Total for the Month		49844	18,050,618	52963	19,898,834		49016	18,265,661

5.2 On-ground infrastructure report

Total number of plaza lanes =

Total number of dedicated ETC lanes = Total number of hybrid lanes =

SNo	Description	Total units	Units working	Units damaged/ missing	Equipment owner/ provider	Equipmentas per specifications (Y/N)	Remarks
1	**Hardware**						
(a)	Over-head transceiver	4	3	1	ABC Co.	Y	
(b)	Hand-held reader						
(c)	Lane controller						
(d)	AVC						
(e)	Camera						
(f)	Weigh-in-motion						
(g)	Static weigh bridge						
(h)	Any other items						
2	**Softwares**						

SNo	Description	Total units	Units working	Units damaged/ missing	Equipment owner/ provider	Equipmentas per specifications (Y/N)	Remarks
(a)	Software – Lane/ Plaza level						
(b)	TMS						
(c)	Any other items						

5.3 On-ground ETC operations and SLA adherence

Lane	Average queue length during peaktime	Average queue length duringnon peaktime	Average Transaction time (cash)	Average transaction time (RFID)	Average transaction time(cards)	Average transaction time(wallet)	Average transction time (others)
Lane 1	10 vehicles	5 vehicles	15 seconds	10 seconds	20 seconds	25 seconds	UPI – 20 seconds
Lane 2							
Lane 3							

- Average system uptime =80%
- Transactions uploaded (as per SLA) =80%
- Blacklists uploaded (as per SLA) =50%
- Blacklists downloaded (as per SLA) = 85%

6 Status of Damages for breach of maintenanceactivities

6.1 Damages for non completion of project facilities

SNo	Period	Amount of damages (Rs)
1	Upto June 2016	15,00,35,000
2	Jul 2016	2,00,88,000
3	Aug 2016	2,00,88,000
4	Sep 2016	1,94,40,000
	Total	**20,96,51,000**

Supporting Calculations for damages for Sep 2016

- No of days in Sep =30
- Performance security is Rs 64,80,00,000
- As per CA Clause 12.3.2 damages payable is 0.1% of performance security per day = Rs6,48,000
- Total damages payable = 30 X 6,48,000 = Rs1,94,40,000

6.2 Damages for breach of maintenance activities

SNo	Period	Amount of damages (Rs)
1	Upto June 2016	1,00,35,000
2	Jul 2016	6.63,196
3	Aug 2016	6,63,196
4	Sep 2016	52,22,444
	Total	**1,65,83,836**

Supporting Calculations for damages for reporting month

SNo	Nature of defect	Unit	Total Quantity	Rate	Cost of repair as estimated	Damages as per CA	Damages at higher side	Dateof inspection	No of daysas per CA	Damages from	Noofdays damages	Damages amount

6.3 Damages for non completion of major maintenance/ periodic overlay

SNo	Period	Amount of damages (Rs)
1	June 2016	6,48,000
2	Jul 2016	2,00,88,000
3	Aug 2016	2,00,88,000
4	Sep 2016	1,94,40,000
	Total	**6,02,64,000**

Supporting Calculations for damages for Sep 2016

- No of days in Sep =30
- Performance security is Rs 64,80,00,000
- As per CA Clause 12.3.2 damages payable is 0.1% of performance security per day = Rs6,48,000

 Total damages payable = 30 X 6,48,000 = Rs1,94,40,000

All figures and graphs in templates are illustrative. Please add actual details.

7 *Change of Scope proposals*

SNo	Proposal Details	Date of first submission	Current status	COS Amount	Expected/ Actual date of approval
1	Construction of *[Flyover Name]* at *[Chainage]*	*[DD/MM/YYYY]*	Approved in principle by Authority. Detailed quantitSCs in proper order yet to be submitted	*[+/- Amount]*	*[DD/MM/YYYY]*
2	Nallah diversion through box culvert at *[Chainage]*	*[DD/MM/YYYY]*	Clarifications to be submitted by Concessionaire, expected date *[DD/MM/YYYY]*	*[+/- Amount]*	*[DD/MM/YYYY]*

8 Status of pendingdisputes

SNo	Dispute Details	Date of first submission to AE	Suggested resolution by AE	Dispute Amount (if applicable)	Current stage

1	Increased tollable length to be applicable in toll fee calculations	*[DD/MM/YYYY]*	No merit in increasing tollable length hence no action required by <Agency>	*NA*	SAROD
2	Filling stations energized without obtaining NOC from ministry	*[DD/MM/YYYY]*	<Agency> to consider the Concessionaire's request for intervention and assistance	*[+/- Amount]*	B/w Concessionaire and <Agency>

All figures and graphs in templates are illustrative. Please add actual details.

9 Reports

9.1 Monthly Toll Collection Report (Applicable only if project highway is tolled)

TYPE OF VEHICLE			For Corresponding month of previous year		For Previous Month		For Current Month		
			No of vehicles	Fee Collected	No of vehicles	Fee Collected	Fee per vehicle	No of vehicles	Fee Collected
A	Car	Single	3845	384500	4659	465,900.00	100	4289	428,900.00
		Return	1506	218370	1972	295,800.00	150	1758	263,700.00
		Local	769	38450	979	48,950.00	50	1029	51,450.00
B	LCV	Single	1521	243360	1312	209,920.00	160	1399	223,840.00
		Return	134	31490	162	38,880.00	240	132	31,680.00
		Local	1683	134640	1838	147,040.00	80	1461	116,880.00
C	Bus	Single	2404	793386	2284	765,207.00	201	2349	786,915.00
		Return	359	177903	173	87,567.00	303	203	102,717.00
		Local	277	45738	205	34,782.00	102	318	54,060.00
D	Truck	Single	1603	528924	1523	510,138.00	134	1566	524,610.00
		Return	240	118602	116	58,378.00	202	136	68,478.00
		Local	185	30492	136	23,188.00	68	212	36,040.00
E	3 Axle	Single	18990	6836400	16310	5,953,150.00	365	15127	5,521,355.00
		Return	131	70740	34	18,700.00	550	37	20,350.00
		Local	69	12420	84	15,540.00	185	131	24,235.00
F	MAV	Single	16119	8381880	21111	11,188,830.00	530	18790	9,958,700.00
		Return	2	1550	20	15,800.00	790	35	27,650.00
		Local	6	1560	18	4,770.00	265	8	2,120.00
G	Over	Single	1	630	27	17,280.00	640	36	23,040.00
		Return		0	0	-	965		-

	Size	**Local**		0	0	-	320		-
	Total for the Month		**49844**	**18,050,618**	**52963**	**19,898,834**		**49016**	**18,265,661**

		1	**S No**	
		1/1/17	**Date**	
		382/050	**Chainage no**	
		05:25 pm	**Time of accident**	
		M	**Sex (M/F)**	
		2	**Accident location**	**A**
		2	**Nature of accident**	**B**
		3	**Classification of accident**	**C**
		4	**Causes**	**D**
		1	**Load conditions of vehicle**	**E**
		1	**Road condition**	**F**
		-	**Intersection type of control**	**G**
		1	**Weather condition**	**H**
		3	**Age of victim**	**I**
		1	**Type of victim**	**J**
		3	**Type of vehicle**	**K**
		-	**Fatal**	**Noof affected**
		1	**Major**	
		1	**Minor**	
		Ambu	**Help provided by**	

Mapping of report fields to responses

A	1. Urban 2. Rural
B	1.Overturned 2.Head On Collision 3.Hit from Back 4.Hit to Fix Object 5.Right turn Collision 6.Left turn Collision 7.Veered Out off The Road 8.Hit Pedestrian 9.Unknown/Hit & Ran Away

C	1. Fatal 2. Major injury 3. Minor injury
D	1.Drunken 2.Over Speeding 3.Vehicle out of Control 4.Driven on wrong side 5.Mechanical Problem 6.Drowsiness/NotApplicable 7.Fault of Driver
E	1. Normally Loaded 2. Overloaded/Handing 3. Empty 4. Unknown
F	1. Straight road 2. Slight Curve 3. Sharp Curve 4. Hump 5. Dip
G	1. T-Junction 2. Y-Junction 3. Four arm Junction 4. Staggered Junction 5. Junction with more than 6. Round about Junction
H	1. Fine/Clear 2. Mist/Fog 3. Cloudy 4. Light Rain 5. Heavy Rain 6. Strong Wind 7. Dust Storm 8. Cold 9.Hot
I	1. 0-18 Years 2. 18-25 Years 3. 25-40 Years 4.40-60 Years 5. 60-80 Years
J	1. Driver 2. Passenger 3. Pedestrian 4. Cyclist 5. Others
K	1. Two Wheeler 2. Auto Rickshaw 3. Car/Jeep 4. Bus 5. Light Truck 6. Heavy Truck 7. Tractor 8. Bicycle 9. Cycle Rickshaw 10. Hand Drawn Cart 11. Animal Drawn Cart

All figures and graphs in templates are illustrative. Please add actual details.

9.3 Details ofcomplaints

SNo	Toll plaza	Complaint No	Date	Name of the person	Contact details of person	Details of complaint	Compliance by the concessionaire
1		81	8/9/2016	Mr. Shailendra Gurjar, LIG-44,RSS mohalla, Shivaji Nagar, Bhopal (M.P.)		Mr. Shailendra Complaints Regarding Potholes on the Highway may cause accidents.	Pot holes are repaired
2		82	10/9/2016	Dr. Anil Diwakar,HIG Swarganga Complex BusStand Seoni (M.P.)		Dr. Diwakar complaints that presence of Animals and also Potholes on road are obstructing the driving which may cause	Animals are continuously driven out from the Road by the Highway Patrolling team and Pot holes are repaired.
3		83	11/9/201	Maj. Sidharth, 238 Fd wksp C/o- 56 APO		Maj. Sidharth while travelling in personal car wants Exemption from Toll Fee on production of I.D.	The Exemption under Indian Toll (Army and Air force) Act 1901, to army personnel travelling in private vehicle may be given if on Govt. duty with requisite

						Card	pass as specified in the Indian Toll (Army and Air Force Rules, 1942)	

All figures and graphs in templates are illustrative. Please add actual details.

9.4 Encroachment list

SNo	Stretch Chainage(km)	Side(LHS/RHS)	District/	Village	Encroachmenttype (Temporary/Permane	Category(Teastall,Temple, etc)	Establishment(New/existing)	Distance from road edge(m)	Encroachment width and length	Name of Encroacher
1	212+500	LHS	Kurnool	Kurnool	Temporary	Teastal	New	7	5mX3.5m	Vijay Kumar Reddy
2	213+200	RHS	Kurnool	Dinnedevara Padu	Permanent	Godown	Existing	5	10.5m X 4m	Buddana

10 Lane Closure Report

S.No	Date	Chainage (Km)		Side	Time of Closure	Reasons for Lane Closure & Approval Details	Remarks
		From	To				
1	9/9/2016	215+300	215+350	RHS	1pm-4pm	Patch work	

11 Annexures

Annexure 1: Detailed visual inspection report of project highway

Assets to be covered- Pavement, Shoulder, Drainage, Median, Bridges, Road furniture, Buildings, Horticulture, Service Road

SNo	NCP/ SNo	Date of issue	Description of defect	Chainage	Side	AE Remarks
1	311	15.08.2016	Potholes	311+200	LHS	To be repaired
2	312	15.08.2016	Cracking	311+500	RHS	To be filled immediately
3						
4						

Annexure 2 onwards:

AE should include comments, status update, data points and reports in following Annexures which have not been included elsewhere in the main report. Such reports may include but not limited to:

- Minutes of review meeting
- Correspondence details
- Weather report
- Organizational chart of Concessionaire and AE
- Project photographs

ENCLOSURE-IB 7

OUTPUT FORMAT FROM NETWORK SURVEY VEHICLE AND FWD TESTING

सड़क परिवहन और राजमार्ग मंत्रालय
MINISTRY OF ROAD TRANSPORT & HIGHWAYS
भारत सरकार Government of India

(PROJECT NAME)

PROJECT MANAGEMENT CONSULTANCY

[NAME OF CONSULTING FIRM]

OUTPUT FROM NETWORK SURVEY VEHICLE AND FWD TESTING

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Enclosure-IB 7:

OUTPUT FORMAT FROM NETWORK SURVEY VEHICLE AND FWD TESTING (SECTION 1: TESTING AT TIME OF COMPLETION, SECTION 2: FWD ATTRIBUTES - ANNUALLY, BALANCE PARAMETERS –BIANNUALLY AFTER CONSTRUCTION PHASE)

In addition to the reports being submitted on equipment based inspection as specified in Section 4.2 of the Monthly Progress Report in the O&M phase, the Authority Engineer (AE) shall submit electronically in excel(.xls) format certain key parameters to the Project Director in the following format.

Worksheets under Section 1 ('Road inventory data') shall be updated from surveys conducted only once at the time of completion testing. Worksheets under Section 2 ('Road condition data') shall be updated from surveys carried out annually for FWD attributes and biannually for the remaining attributes.

The fields to be updated in each of the worksheets are described below. Each description is followed by an example of data for a sample project.

SECTION 1 - ROAD INVENTORY DATA

Road inventory data consists of parameters which provide basic information about roads such as pavement type, number of lanes, topography, etc. These parameters are largely static in nature, and therefore a survey to update this dataset shall be conducted only once at the time of completion testing. The road inventory data shall be used to update specific worksheets listed below.

1.1 Location Reference Post (LRP) Master

The following table lists the fields which need to be populated for the 'LRP Master' attribute. The descriptions of the fields are given below.

Field	Descriptio	Exampl
NH Number	New National Highway number	NH0065
LRP Name	Name of location reference post (LRP)	Km stone 17
Chainage	Chainage of the survey point (in km)	17
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Old NH Number	Old National Highway number	NH0065

Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)

A sample output is shown below for reference

NH Number	LRP Name	Chainag	Direction	Latitud	Longitud	Altitude	Surve y	Old NH Number	Section Code
NH0xxx	Road Start	1.230	Increasin	9.98897	78.02671	63.07767	23-12-15	NH0yyy	ABC-DEF
NH0xxx	Km Stone 8	8.000	Increasin	9.98444	78.02934	68.60126	23-12-15	NH0yyy	ABC-DEF
NH0xxx	Km Stone 8	8.030	Increasin	9.98341	78.03004	68.15520	23-12-15	NH0yyy	ABC-DEF
NH0xxx	Km Stone	9.008	Increasin	9.98107	78.03078	65.17153	23-12-15	NH0yyy	ABC-DEF
NH0xxx	Km Stone	12.012	Increasin	9.96328	78.04160	56.03436	23-12-15	NH0yyy	ABC-DEF
NH0xxx	Km Stone	17.085	Increasin	9.95385	78.05255	56.24748	23-12-15	NH0yyy	ABC-DEF

1.2 Carriageway Type

The following table lists the fields which need to be populated for the 'Carriageway Type' attribute. The descriptions of the fields are given below.

Field	Descriptio	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Start Chainage	Chainage of the start point (in km)	0.500
End Chainage	Chainage of the end point (in km)	1.500
Carriageway Type	Type of carriageway, classified into one of the below categories: • Divided • Undivided	Divided
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference

NHNumbe	Section	Start Chainage	End Chainage	Carriageway Type	Date of Survey	Latitud	Longitude
NH00xx	ABC-DEF	0.000	0.794	Undivide	06-05-17	9.98897	78.02671
NH00xx	ABC-DEF	0.794	1.000	Undivide	06-05-17	9.98444	78.02934
NH00xx	ABC-DEF	1.000	2.810	Undivide	06-05-17	9.98341	78.03004
NH00xx	ABC-DEF	2.810	4.335	Undivide	06-05-17	9.98107	78.03078
NH00xx	ABC-DEF	4.335	6.666	Undivide	06-05-17	9.96328	78.04160
NH00xx	ABC-DEF	6.666	12.906	Undivide	06-05-17	9.95385	78.05255

1.3 Road Type

The following table lists the fields which need to be populated for the 'Road Type' attribute. The descriptions of the fields are given below.

Field	Descriptio	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Start Chainage	Chainage of the start point (in km)	0.500
End Chainage	Chainage of the end point (in km)	1.500
Road Type	Classification of road on basis of number of lanes • SingleLane • TwoLane • Intermediate Lane • FourLane • SixLane	Four Lane
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NHNumbe	Section	Start Chainage	End Chainage	RoadType	Date of Survey	Latitud	Longitude
NH00xx	ABC-DEF	0.000	0.794	Two Lane	06-05-17	9.98897	78.02671
NH00xx	ABC-DEF	0.794	1.000	Two Lane	06-05-17	9.98444	78.02934
NH00xx	ABC-DEF	1.000	2.810	Two Lane	06-05-17	9.98341	78.03004
NH00xx	ABC-DEF	2.810	4.335	Two Lane	06-05-17	9.98107	78.03078
NH00xx	ABC-DEF	4.335	6.666	Two Lane	06-05-17	9.96328	78.04160
NH00xx	ABC-DEF	6.666	12.906	Two Lane	06-05-17	9.95385	78.05255

1.4 Pavement Type

The following table lists the fields which need to be populated for the 'Pavement Type' attribute. The descriptions of the fields are given below.

Field	Descriptio	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Start Chainage	Chainage of the start point (in km)	0.500
End Chainage	Chainage of the end point (in km)	1.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Pavement Type	Classification of pavement based on type of	Asphalt

Field	Descriptio	Example
	• Asphalt • Cementconcrete	
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NHNumbe	Section	Start Chainage	End Chainage	Direction	Pavement Type	Date of Survey	Latitud	Longitude
NH00xx	ABC-DEF	0.000	0.804	Both	Asphal	06-05-17	9.98897	78.02671
NH00xx	ABC-DEF	0.804	1.000	Both	Asphal	06-05-17	9.98444	78.02934
NH00xx	ABC-DEF	1.000	1.172	Both	Asphal	06-05-17	9.98341	78.03004
NH00xx	ABC-DEF	1.172	2.821	Both	Asphal	06-05-17	9.98107	78.03078
NH00xx	ABC-DEF	2.821	4.350	Both	Asphal	06-05-17	9.96328	78.04160
NH00xx	ABC-DEF	4.350	6.710	Both	Asphal	06-05-17	9.95385	78.05255
NH00xx	ABC-DEF	6.710	12.925	Both	Asphal	06-05-17	9.93102	78.05648

1.5 Pavement Width

The following table lists the fields which need to be populated for the 'Pavement Width' attribute. The descriptions of the fields are given below.

Field	Descriptio n	Exampl e
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Start Chainage	Chainage of the start point (in km)	0.500
End Chainage	Chainage of the end point (in km)	1.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Pavement Width	Width of the pavement in metres, classified into one of the below categories >=3.75m and <5.5m >5.5m and <7m >=7m and <10.5m >=10.5m and <=12.5m >12.5m	>7m and <10.5m
Pavement Width Value	Width of the pavement in metres, rounded to two places after decimal	7.0

Field	Description	Example
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NH Number	Section Code	Start Chainage	End Chainage	Direction	Pavement Width	Pavement Width Value	Survey	Latitude	Longitude
NH00xx	ABC-DEF	0.000	0.794	Both	7 – 10.5	7.00	06-05-	9.98897	78.02671
NH00xx	ABC-DEF	0.794	1.000	Both	7 – 10.5	7.00	06-05-	9.98444	78.02934
NH00xx	ABC-DEF	1.000	2.810	Both	7 – 10.5	7.00	06-05-	9.98341	78.03004
NH00xx	ABC-DEF	2.810	4.335	Both	7 – 10.5	7.00	06-05-	9.98107	78.03078
NH00xx	ABC-DEF	4.335	6.666	Both	7 – 10.5	7.00	06-05-	9.96328	78.04160
NH00xx	ABC-DEF	6.666	12.906	Both	7 – 10.5	7.00	06-05-	9.95385	78.05255

1.6 Shoulder Type

The following table lists the fields which need to be populated for the 'Shoulder Type' attribute. The descriptions of the fields are given below.

Field	Description	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Start Chainage	Chainage of the start point (in km)	0.500
End Chainage	Chainage of the end point (in km)	1.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Shoulder Type	Type of shoulder, classified into one of the below categories: • None • Paved • Gravel • Earth	Gravel
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NH	Section Code	StartChainage	End Chainage	Directio	ShoulderTyp	SurveyDate	Latitud	Longitude
NH00xx	ABC-DEF	0.000	0.763	Increasin	No Shoulder	09-01-16	9.98897	78.02671
NH00xx	ABC-DEF	0.763	0.834	Increasin	Gravel	09-01-16	9.98444	78.02934
NH00xx	ABC-DEF	0.834	1.254	Increasin	Gravel	09-01-	9.98341	78.0300
NH00xx	ABC-DEF	1.254	2.945	Increasin	Gravel	05-01-	9.98107	78.0307
NH00xx	ABC-DEF	2.945	4.327	Increasin	Gravel	05-01-	9.96328	78.0416
NH00xx	ABC-DEF	4.327	4.405	Increasin	Gravel	05-01-	9.95385	78.0525
NH00xx	ABC-DEF	4.405	6.844	Increasin	Gravel	05-01-	9.93102	78.0564
NH00xx	ABC-DEF	6.844	9.359	Increasin	Gravel	05-01-	9.91229	78.0496
NH00xx	ABC-DEF	9.359	12.966	Increasin	Gravel	05-01-	9.89041	78.0345

1.7 Shoulder Width

The following table lists the fields for the 'Shoulder Width' attribute, which need to be populated. The descriptions of the fields are given below.

Field	Descriptio	Exampl
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Start Chainage	Chainage of the start point (in km)	0.500
End Chainage	Chainage of the end point (in km)	1.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Shoulder Width	Width of the shoulder in metres, classified into one of the below categories • No shoulder • <1m • >=1m and <=2m • >2m	< 1m
Shoulder Width Value	Width of the shoulder in metres, rounded to one place after decimal	0.5
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NH Number	Section Code	Start Chainage	End Chainage	Direction	Shoulder Width	Shoulder Width Value	Survey	Latitude	Longitude
NH0xxx	ABC-DEF	0.000	0.785	Increasing	No Shoulde	0.0	03-01-	9.98897	78.02671
NH0xxx	ABC-DEF	0.785	2.612	Increasing	No Shoulde	0.0	03-01-	9.98444	78.02934
NH0xxx	ABC-DEF	2.612	3.170	Increasing	1-2m	2.0	03-01-	9.98341	78.03004
NH0xxx	ABC-DEF	3.170	5.194	Increasing	1-2m	2.0	03-01-	9.98107	78.03078
NH0xxx	ABC-DEF	5.194	6.793	Increasing	1-2m	2.0	03-01-	9.96328	78.04160
NH0xxx	ABC-DEF	6.793	11.404	Increasing	1-2m	2.0	03-01-	9.95385	78.05255

1.8 Topography

The following table lists the fields which need to be populated for the 'Topography' attribute. The descriptions of the fields are given below.

Field	Description	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Start Chainage	Chainage of the start point (in km)	0.500
End Chainage	Chainage of the end point (in km)	1.500
Topography	Topography of the road, classified into one of the below categories • Flat • Rolling • Hilly	Flat
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NH Number	Section Code	Start Chainage	End Chainage	Topograph	Survey	Latitud	Longitude
NH0xxx	ABC-DEF	0.000	0.808	Flat	05-01-16	9.98897	78.02671
NH0xxx	ABC-DEF	0.808	1.254	Flat	05-01-16	9.98444	78.02934
NH0xxx	ABC-DEF	1.254	2.828	Flat	05-01-16	9.98341	78.03004
NH0xxx	ABC-DEF	2.828	4.363	Flat	05-01-16	9.98107	78.03078
NH0xxx	ABC-DEF	4.363	6.724	Flat	05-01-16	9.96328	78.04160
NH0xxx	ABC-DEF	6.724	12.933	Flat	05-01-16	9.95385	78.05255

1.9 Cross Section

The following table lists the fields which need to be populated for the 'Cross Section' attribute. The descriptions of the fields are given below.

Field	Description	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Start Chainage	Chainage of the start point (in km)	0.500
End Chainage	Chainage of the end point (in km)	1.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Cross Section	Cross section type, classified into one of the below categories	Fill
Field	**Description**	**Example**
	• Cut • Fill • Cut and Fill • Level	
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NH	Section Code	Start Chainag	End Chainage	Direction	CrossSection	Survey Date	Latitud	Longitud
NH0xxx	ABC-DEF	0.000	0.822	Increasing	Level	03-01-16	9.98897	78.02671
NH0xxx	ABC-DEF	0.822	2.642	Increasing	Level	03-01-16	9.98444	78.02934
NH0xxx	ABC-DEF	2.642	3.199	Increasing	Level	03-01-16	9.98341	78.03004
NH0xxx	ABC-DEF	3.199	5.360	Increasing	Level	03-01-16	9.98107	78.03078
NH0xxx	ABC-DEF	5.360	5.715	Increasing	Fill	03-01-16	9.96328	78.04160
NH0xxx	ABC-DEF	5.715	6.941	Increasing	Level	03-01-16	9.95385	78.05255
NH0xxx	ABC-DEF	6.941	11.163	Increasing	Level	03-01-16	9.93102	78.05648

1.10 Drain Type

The following table lists the fields which need to be populated for the 'Drain Type' attribute. The descriptions of the fields are given:

Field	Description	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Start Chainage	Chainage of the start point (in km)	0.500
End Chainage	Chainage of the end point (in km)	1.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Drain Type	Type of drain, classified into one of the below categories • Open unlined drain • Open lined drain • Covered line drain • No drain	Open lined drain
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NHNumbe	SectionCod	StartChaina	EndChaina	Directio	DrainType	SurveyDa	Latitud	Longitu
NH0xxx	ABC-DEF	0.000	0.069	Increasin	Open Unlined Drain	09-01-16	9.9889	78.0267
NH0xxx	ABC-DEF	0.069	0.782	Increasin	Open Lined	09-01-16	9.9844	78.0293
NH0xxx	ABC-DEF	0.288	0.000	Decreasin	Open Unlined Drain	09-01-16	9.9834	78.0300
NH0xxx	ABC-DEF	0.782	0.846	Increasin	Open Unlined Drain	09-01-16	9.9810	78.0307
NH0xxx	ABC-DEF	0.846	1.254	Increasin	Open Unlined Drain	09-01-16	9.9632	78.0416
NH0xxx	ABC-DEF	1.254	2.265	Increasin	Open Unlined Drain	05-01-16	9.9538	78.0525
NH0xxx	ABC-DEF	1.929	0.288	Decreasin	Open Unlined Drain	09-01-16	9.9310	78.0564
NH0xxx	ABC-DEF	1.952	1.929	Decreasin	No Drain	09-01-16	9.9122	78.0496
NH0xxx	ABC-DEF	2.265	3.005	Increasin	Open Unlined Drain	05-01-16	9.8904	78.0345
NH0xxx	ABC-DEF	2.680	1.952	Decreasin	Open Unlined Drain	09-01-16	9.8848	78.0299
NH0xxx	ABC-DEF	3.005	4.424	Increasin	Open Unlined Drain	05-01-16	9.8747	78.0282
NH0xxx	ABC-DEF	3.109	2.680	Decreasin	Open Unlined Drain	09-01-16	9.8736	78.0274
NH0xxx	ABC-DEF	3.320	3.109	Decreasin	Covered Line Drain	09-01-16	9.8485	78.0153
NH0xxx	ABC-DEF	3.917	3.320	Decreasin	Open Unlined Drain	09-01-16	9.8376	78.0039
NH0xxx	ABC-DEF	4.424	4.601	Increasin	Open Unlined Drain	05-01-16	9.8371	77.9857
NH0xxx	ABC-DEF	4.601	5.693	Increasin	Open Unlined Drain	05-01-16	9.8338	77.9772

1.11 Median Opening

The following table lists the fields which need to be populated for the 'Median Opening' attribute. The descriptions of the fields are given below.

Field	Descriptio	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Start Chainage	Chainage of the start point (in km)	0.500
End Chainage	Chainage of the end point (in km)	1.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Median Type	Type of median, classified into one of the below categories • Raised; • Depressed; • Barrier; • None.	Raised
Field	**Descriptio**	**Example**
Median Width	Width of the median in metres, rounded to one place after decimal	0.5
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NHNumbe	Section Code	Start Chainage	End Chainage	Directio	Media n	Media n	Surve y	Latitud	Longitud
NH00xx	ABC-DEF	0.000	0.794	Both	Raised	0.5	05-01-	9.98897	78.02671
NH00xx	ABC-DEF	0.794	1.000	Both	Raised	0.5	05-01-	9.98444	78.02934
NH00xx	ABC-DEF	1.000	2.810	Both	No Median	0.0	05-01-	9.98341	78.03004
NH00xx	ABC-DEF	2.810	4.335	Both	Raised	1.5	05-01-	9.98107	78.03078
NH00xx	ABC-DEF	4.335	6.666	Both	No Median	0.0	05-01-	9.96328	78.04160
NH00xx	ABC-DEF	6.666	12.906	Both	No Median	0.0	05-01-	9.95385	78.05255

1.12 Right Of Way

The following table lists the fields which need to be populated for the 'Right of Way' attribute. The descriptions of the fields are given below.

Field	Descriptio	Exampl
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Start Chainage	Chainage of the start point (in km)	0.500
End Chainage	Chainage of the end point (in km)	1.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Row Width	Width of Right of Way (in metres)	24
Remarks		
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NHNumbe	Section Code	Start Chainage	End Chainage	Directio	ROW Width	Remark	Surve y	Latitud	Longitud
NH0xxx	ABC-DEF	0.000	1.000	Increasin	28		05-05-	9.9889	78.02671
NH0xxx	ABC-DEF	1.000	2.000	Increasin	24		05-05-	9.9844	78.02934
NH0xxx	ABC-DEF	2.000	3.000	Increasin	30		05-05-	9.9834	78.03004
NH0xxx	ABC-DEF	3.000	4.000	Increasin	26		05-05-	9.9810	78.03078
NH0xxx	ABC-DEF	4.000	11.000	Increasin	24		05-05-	9.9632	78.04160

1.13 Pavement composition

The following table lists the fields which need to be populated for the 'Pavement composition' attribute. The descriptions of the fields are given below.

Field	Descriptio	Exampl
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Start Chainage	Chainage of the start point (in km)	0.500
End Chainage	Chainage of the end point (in km)	1.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Pavement Type	Type of pavement • Asphalt • Cementconcrete	Asphalt
Bituminous Surface Course Type	Type of bituminous surface course	BC

Bituminous Surface Course Thickness MM	Thickness of BSC layer in mm	40
BSC Construction Year	Year of construction of BSC layer in flexible	2015
Bituminous Base Course Type	Type of bituminous base course	DBM
Bituminous Base Course Thick—ness	Thickness of BBC layer in mm	100
BBC Construction Year	Year of construction of BBC layer in flexible	2015
Granular Base Type	Type of granular base	WMM
Granular Base Thick- ness	Thickness of GB layer in mm	250
GB Construction Year	Year of construction of GB layer in flexible	2015
Pavement Quality Concrete Type	Type of pavement quality concrete	PQC
Pavement Quality Concrete Thickness	Thickness of PQC layer in mm	300
PQC Construction Year	Year of construction of PQC layer in rigid	2015
Dry Lean ConcreteThicknes	Thickness of DLC layer in mm	100
Dry Lean ConcreteType	Type of dry lean concrete	DLC
DLC Construction Year	Year of construction of DLC layer in rigid	2015
Granular Sub Base Type	Type of granular sub base	GSB
Granular Sub Base Thickness	Thickness of GSB layer in mm	200
GSB Construction Year	Year of construction of GSB layer	2014
Design CBR	Design CBR of the subgrade, expressed in %	5%
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Field	**Descriptio**	**Exampl**
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NH No.	Sec-tion Code	Star t Chai nag	End Chai nag	Direc - tion	Paveme nt Type	Bitumino u s Surface Course	Bitumino u s Surface Course	BSC Constr u c- tion	Bitumin o us Base Course	Bitumin o us Base Course	BBC Constr u c- tion	Granu l arBase	Granula r Base Thickne ss
NH00 x	ABC-DEF	0.0	5.0	Bot h	Asphal	BC	40.0	2015	DBM	100	2015	WMM	250
NH00 x	ABC-DEF	5.0	11.0	Bot h	Asphal	BC	40.0	2015	DBM	80	2015	WMM	250
NH00 x	ABC-DEF	11.0	20.0	Bot h	Asphal	SDBC	25.0	2015	BM	115	2015	WMM	250
NH00 x	ABC-DEF	20.0	22.0	Bot h	Asphal	BC	40.0	2015	DBM	100	2015	WMM	250
NH00 x	ABC-DEF	22.0	30.0	Bot h	Asphal	SDBC	25.0	2015	BM	115	2015	WMM	250
NH00 x	ABC-DEF	30.0	31.0	Bot h	Asphal	BC	40.0	2015	DBM	100	2015	WMM	250

(table continued…)

GB Construction Year	Pavement Quality Concrete	Pavement Quality Concrete Thick	PQC Construction Year	Dry Lean Concrete Thickness	Dry Lean Concrete Type	DLC Construction Year	Granular Sub Base Type	Granular SubBase Thickness	GSB Construction Year	Design CBR	Survey Date	Latitude	Longitude
201	NA	N	NA	NA	NA	N	GSB	300	2015	5	05-05-	9.9	78.0
201	NA	N	NA	NA	NA	N	GSB	300	2015	5	05-05-	9.9	78.0
201	NA	N	NA	NA	NA	N	GSB	300	2015	5	05-05-	9.9	78.0
201	NA	N	NA	NA	NA	N	GSB	300	2015	5	05-05-	9.9	78.0
201	NA	N	NA	NA	NA	N	GSB	300	2015	5	05-05-	9.9	78.0
201 5	NA	N A	NA	NA	NA	N A	GSB	300	2015	5 %	05-05-15	9.9 5	78.0 5

1.14 Carriageway Furniture

The following table lists the fields which need to be populated for the 'Carriageway Furniture' attribute. The descriptions of the fields are given below.

Field	Descriptio	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Chainage	Chainage of the point (in km)	0.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Field	**Descriptio**	**Example**
Wayside Amenity Type	Wayside amenities classified into one of the below categories: • Crashbarriers • Signs • StreetLights • Kmstone	Road sign
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NHNumbe	SectionCode	Chainage	Direction	EventTyp	SurveyDat	Latitud	Longitud
NH00xx	ABC-DEF	0.012	Increasing	Street Light	03-01-16	9.98897	78.02671
NH00xx	ABC-DEF	0.287	Increasing	Street LightEn	03-01-16	9.98444	78.02934
NH00xx	ABC-DEF	2.491	Decreasing	Road Sign	03-01-16	9.98341	78.03004
NH00xx	ABC-DEF	2.708	Decreasing	Road Sign	03-01-16	9.98107	78.03078
NH00xx	ABC-DEF	3.496	Increasing	Road Sign	03-01-16	9.96328	78.04160
NH00xx	ABC-DEF	5.160	Increasing	Road Sign	03-01-16	9.95385	78.05255
NH00xx	ABC-DEF	5.356	Decreasing	Road Sign	03-01-16	9.93102	78.05648
NH00xx	ABC-DEF	8.402	Decreasing	Road Sign	03-01-16	9.91229	78.04961
NH00xx	ABC-DEF	10.966	Decreasing	Road Sign	03-01-16	9.89041	78.03458

1.15 Wayside Amenities

The following table lists the fields which need to be populated for the 'Wayside Amenities' attribute. The descriptions of the fields are given below.

Field	Descriptio	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Chainage	Chainage of the point (in km)	0.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Wayside Amenity	Wayside amenities classified into one of the below categories: • Bus shelter; • Culverts; • Restaurant/Motel; • Toilet/Public convenience; • Rest Rooms for short stay; • Toll Plaza; • First aid/Medical centre;	Restaurant/Motel
Field	**Descriptio**	**Example**
	• Telephone booth; • Petrol pump/minor repair shop(optional); • Police Station; • Temple/Mosque; • Bridges.	
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Data Source		
Remarks		
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NH Numbe	Section Code	Chainage	Direction	Wayside	Surve y	Data Source	Remark	Latitud	Longitude
NH00x	ABC-DEF	0.650	Increasing	Restaurant/Mot	05-01-			9.98897	78.02671
NH00x	ABC-DEF	1.998	Increasing	Restaurant/Mot	05-01-			9.98444	78.02934
NH00x	ABC-DEF	5.524	Increasing	Petrol Pump	05-01-			9.98341	78.03004
NH00x	ABC-DEF	11.413	Increasing	Restaurant/Mot	05-01-			9.98107	78.03078

1.16 Land Use

The following table lists the fields which need to be populated for the 'Land Use' attribute. The descriptions of the fields are given below.

Field	Descriptio	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Start Chainage	Chainage of the start point (in km)	0.500
End Chainage	Chainage of the end point (in km)	1.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Land Use	Land use classified into one of the below categories: • Residential; • Commercial; • Industrial; • Agricultural; • Waterbodies;	Commercial
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Field	**Descriptio**	**Example**
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NHNumbe	SectionCode	StartChainag	EndChainag	Direction	LandUse	SurveyDat	Latitude	Longitud
NH00xx	ABC-DEF	0.000	0.797	Increasing	Mixed	03-01-16	9.98897	78.02671
NH00xx	ABC-DEF	0.511	0	Decreasing	Mixed	03-01-16	9.98444	78.02934
NH00xx	ABC-DEF	0.797	2.699	Increasing	Mixed	03-01-16	9.98341	78.03004
NH00xx	ABC-DEF	0.835	0.511	Decreasing	Mixed	03-01-16	9.98107	78.03078
NH00xx	ABC-DEF	0.987	0.835	Decreasing	Mixed	03-01-16	9.96328	78.04160
NH00xx	ABC-DEF	1.641	0.987	Decreasing	Agriculture	03-01-16	9.95385	78.05255
NH00xx	ABC-DEF	2.081	1.641	Decreasing	Barren	03-01-16	9.93102	78.05648
NH00xx	ABC-DEF	2.378	2.081	Decreasing	Agriculture	03-01-16	9.91229	78.04961
NH00xx	ABC-DEF	2.458	2.378	Decreasing	Agriculture	03-01-16	9.89041	78.03458
NH00xx	ABC-DEF	2.699	3.234	Increasing	Agriculture	03-01-16	9.88489	78.02995

SECTION 2 - ROAD CONDITION DATA

Road condition data consists of parameters which directly affect maintenance requirements of the road. These parameters are dynamic in nature, and therefore a survey to update this dataset shall be conducted annually for FWD testing and every six months as per Annexure IV for network survey vehicle testing. The first survey shall be conducted at the time of completion testing and the remaining surveys shall be conducted as per the defined frequency.

As an example, if majority of highway length (>50%) passes through a state, where defined survey months are May and November, if completion testing is conducted in April, then the first network survey shall be conducted in the month of April. This shall be considered as the network survey to be conducted in the month of May. The 2nd survey shall be conducted in the month of November, the 3rd survey shall be conducted in the month of May and so on. As regards FWD, the first test/survey shall be conducted at the time of completion in April. The 2nd test/survey shall be conducted in April of next year and so on.

The road condition data shall be used to update specific worksheets, which are listed below.

2.1 Visual condition

The following table lists the fields which need to be populated for the 'Visual Condition' attribute. The descriptions of the fields are given below.

Field	Descriptio	Exampl
NH Number	New National Highway number	NH0065
Field	**Description**	**Exampl**
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Start Chainage	Chainage of the start point (in	0.500
End Chainage	Chainage of the end point (in	1.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Lane Number	Number of the lane:L1,L2,R1,R2,etc., L1 being 1st lane on the left from centerline of carriageway, L2 being 2nd lane on the left from centerline and	L1
Ravelling	Percent of pavement area affected by ravelling, which is converted to the following rating scale: • 1-VeryPoor (>30%) • 2-Poor (11-30%) • 3-Fair (6-10%) • 4-Good (1-5%) • 5-VeryGood (0%)	2

Pot Holes	No. of potholes, which is converted to the following rating scale: • 1-VeryPoor(>5) • 2-Poor(3-5) • 3-Fair(2) • 4-Good(1) • 5-VeryGood(0)	1
Edge Break	Pavement area containing edge breaks, which is converted to the following rating scale: • 1-Very Poor(>5m^2) • 2-Poor(1-5m^2) • 3-Fair(0.5-1m^2) • 4-Good(0-0.5m^2) • 5-VeryGood(0m^2)	3
Cracking	Percent of pavement area affected by cracking, which is converted to the following rating scale: • 1-Very Poor(>30%) • 2-Poor(21-30%) • 3-Fair(11-20%) • 4-Good(5-10%) • 5-Very Good(<5%)	3
Disintegration	Percent of pavement area affected by disintegration, which is converted to the following rating scale: • 1-Very Poor(>50%) • 2-Poor(20-50%) • 3-Fair(10-20%) • 4-Good(1-10%)	2
Field	**Descriptio**	**Exampl**
Depression	Percent of pavement area affected by depression, which is converted to the following rating scale: • 1-Very Poor(>5%) • 2-Poor(3-5%) • 3-Fair(1-2%) • 4-Good(0-1%)	5
Bleeding	Percent of pavement area affected by bleeding, which is converted to the following rating scale: • 1-Very Poor(>50%) • 2-Poor(20-50%) • 3-Fair(10-20%) • 4-Good(1-10%) • 5-Very Good(<1%)	3

Patching	Percent of pavement area affected by patching, which is converted to the following rating scale: • 1-Very Poor(>30%) • 2-Poor(16-30%) • 3-Fair(6-15%) • 4-Good(2-5%) • 5-Very Good(<2%)	4
Drain Condition	Condition of the drain, which is converted to the following rating scale: • 1-Poor • 2-Fair • 3-Good	2
Shoulder Condition	Condition of the shoulder, which is converted to the following rating scale: • 1-Poor • 2-Fair • 3-Good	Fair
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NHNumbe	Section	Start Chainage	End Chainage	Directio	Lane Numbe	Ravellin	PotHoles	EdgeBrea	Cracking
NH00xx	ABC-DEF	0.000	0.500	Increasin	L1	4	4	4	4
NH00xx	ABC-DEF	0.500	1.000	Increasin	L1	4	4	4	5
NH00xx	ABC-DEF	1.000	1.500	Increasin	L1	5	5	4	5
NH00xx	ABC-DEF	1.500	2.000	Increasin	L1	5	5	5	5
NH00xx	ABC-DEF	2.000	2.500	Increasin	L1	5	5	5	5
NH00xx	ABC-DEF	2.500	3.000	Increasin	L1	5	5	4	5
NH00xx	ABC-DEF	3.000	3.500	Increasin	L1	5	5	4	5
NH00xx	ABC-DEF	3.500	4.000	Increasin	L1	5	4	3	5
NH00xx	ABC-DEF	4.000	4.500	Increasing	L1	4	4	4	5
NH00xx	ABC-DEF	4.500	5.000	Increasing	L1	5	5	4	5
NH00xx	ABC-DEF	5.000	5.500	Increasing	L1	5	5	4	5
NH00xx	ABC-DEF	5.500	6.000	Increasing	L1	5	5	4	5
NH00xx	ABC-DEF	6.000	6.500	Increasing	L1	5	5	4	5
NH00xx	ABC-DEF	6.500	7.000	Increasing	L1	5	5	4	5
NH00xx	ABC-DEF	7.000	7.500	Increasing	L1	5	5	5	5
NH00xx	ABC-DEF	7.500	8.000	Increasing	L1	5	5	4	5
NH00xx	ABC-DEF	8.000	8.500	Increasing	L1	5	5	4	5
NH00xx	ABC-DEF	8.500	9.000	Increasing	L1	5	5	4	5
NH00xx	ABC-DEF	9.000	9.500	Increasing	L1	5	5	4	5
NH00xx	ABC-DEF	9.500	10.000	Increasing	L1	5	5	3	5

(table continued…)

Disintegratio	Depressio	Bleeding	Patching	Drain Condition	ShoulderConditio	Date of Survey	Latitud	Longitud
4	4	4	4	2	2	06-05-	9.98897	78.02671
4	4	4	4	2	2	06-05-	9.98444	78.02934
5	5	5	4	2	2	06-05-	9.98341	78.03004
5	5	5	5	2	2	06-05-	9.98107	78.03078
5	5	5	5	2	2	06-05-	9.96328	78.04160
5	5	5	5	2	2	06-05-	9.95385	78.05255
5	5	5	5	2	3	06-05-	9.93102	78.05648
4	4	4	4	2	3	06-05-	9.91229	78.04961
4	4	4	4	2	2	06-05-	9.89041	78.03458
5	5	5	5	2	2	06-05-	9.88489	78.02995
5	5	5	5	2	2	06-05-	9.87474	78.02828
5	5	5	5	2	2	06-05-	9.87363	78.02744
5	5	5	5	2	2	06-05-	9.84857	78.01535
5	5	5	5	2	2	06-05-	9.83764	78.00392
5	5	5	5	2	2	06-05-	9.83711	77.98576
5	5	5	5	1	2	06-05-	9.83386	77.97729
5	5	5	5	2	2	06-05-	9.81804	77.97875
5	5	5	5	2	2	06-05-	9.77426	77.98129
5	4	4	4	2	2	06-05-	9.73071	77.97999
5	5	5	3	2	2	06-05-	9.68686	77.97017

2.2 Roughness

The following table lists the fields which need to be populated for the 'Roughness' attribute. The descriptions of the fields are given below.

Field	Descriptio	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Field	**Descriptio**	**Example**
Start Chainage	Chainage of the start point (in km)	0.500
End Chainage	Chainage of the end point (in km)	1.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
LwpIri	International roughness index (IRI) of left wheel path measured from laser profilometer	2.33
RwpIri	International roughness index (IRI) of right wheel path measured from laser	1.97
LaneIri	Average of the International roughness index (IRI) of left and right wheel paths	2.15
Speed	Speed of vehicle in km/h	42
Survey Date	Date of survey in the format <DD-MM-YYYY>	06-05-17

Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NH Numbe	Section Code	Start Chainage	End Chainage	Directio	Lane Numbe	LwpIr	RwpIr	LaneIr	Speed	Surve y	Latitud	Longitud
NH00xx	ABC-DEF	0.0	0.1	Increasin	L1	3.31	5.16	4.24	20	06-05-17	9.9889	78.02671
NH00xx	ABC-DEF	0.1	0.2	Increasin	L1	2.81	3.54	3.18	37	06-05-17	9.9844	78.02934
NH00xx	ABC-DEF	0.2	0.3	Increasin	L1	2.31	1.92	2.12	42	06-05-17	9.9834	78.03004
NH00xx	ABC-DEF	0.3	0.4	Increasin	L1	2.17	2.37	2.27	46	06-05-17	9.9810	78.03078
NH00xx	ABC-DEF	0.4	0.5	Increasin	L1	2.11	1.72	1.92	42	06-05-17	9.9632	78.04160
NH00xx	ABC-DEF	0.5	0.6	Increasin	L1	2.33	1.97	2.15	49	06-05-17	9.9538	78.05255
NH00xx	ABC-DEF	0.6	0.7	Increasin	L1	2.37	2.00	2.19	42	06-05-17	9.9310	78.05648
NH00xx	ABC-DEF	0.7	0.8	Increasin	L1	2.15	2.17	2.16	33	06-05-17	9.9122	78.04961
NH00xx	ABC-DEF	0.8	0.9	Increasin	L1	2.45	2.05	2.25	32	06-05-17	9.8904	78.03458
NH00xx	ABC-DEF	0.9	1.0	Increasin	L1	2.18	2.51	2.35	48	06-05-17	9.8848	78.02995

2.3 Rutting

The following table lists the fields which need to be populated for the 'Rutting' attribute. The descriptions of the fields are given below.

Field	Description	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad
Start Chainage	Chainage of the start point (in km)	0.500
Field	**Description**	**Example**
End Chainage	Chainage of the end point (in km)	1.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Lane Number	Number of the lane: L1, L2, R1, R2, etc., L1 being 1st lane on the left from centerline of carriageway, L2 being 2nd lane on the left from centerline and	L1
Rutting Left	Rut depth in mm, measured from left wheel path	20
Rutting Right	Rut depth in mm, measured from right wheel path	18
Rutting Avg	Average rut depth measured from left and right wheel paths	19

Speed	Speed of vehicle in km/h	42
Survey Date	Date of survey in the format <DD-MM-YYYY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NH Numbe	Section Code	Start Chainage	End Chainage	Directio	Lane Numbe	Ruttin g	Ruttin g	Ruttin g	Speed	Surve y	Latitud	Longitud
NH00xx	ABC-DEF	0.0	0.5	Increasin	L1	15	14	15	20	06-05-17	9.9889	78.02671
NH00xx	ABC-DEF	0.5	1.0	Increasin	L1	20	18	19	37	06-05-17	9.9844	78.02934
NH00xx	ABC-DEF	1.0	1.5	Increasin	L1	10	8	9	42	06-05-17	9.9834	78.03004
NH00xx	ABC-DEF	1.5	2.0	Increasin	L1	5	6	6	46	06-05-17	9.9810	78.03078
NH00xx	ABC-DEF	2.0	2.5	Increasin	L1	10	10	10	42	06-05-17	9.9632	78.04160
NH00xx	ABC-DEF	2.5	3.0	Increasin	L1	7	5	6	49	06-05-17	9.9538	78.05255
NH00xx	ABC-DEF	3.0	3.5	Increasin	L1	20	18	19	42	06-05-17	9.9310	78.05648
NH00xx	ABC-DEF	3.5	4.5	Increasin	L1	5	5	5	33	06-05-17	9.9122	78.04961
NH00xx	ABC-DEF	4.5	5.0	Increasin	L1	5	5	5	32	06-05-17	9.8904	78.03458

2.4 Texture Depth

The following table lists the fields which need to be populated for the 'Texture Depth' attribute. The descriptions of the fields are given below.

Field	Descriptio	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad
Start Chainage	Chainage of the start point (in km)	0.500
Field	**Descriptio**	**Example**
End Chainage	Chainage of the end point (in km)	1.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Lane Number	Number of the lane: L1, L2, R1, R2, etc., L1 being 1st lane on the left from centerline of carriageway, L2 being 2nd lane on the left from centerline and	L1

Texture Left	Texture depth of pavement in mm, measured from left wheelpath	0.40
Texture Right	Texture depth of pavement in mm, measured from right wheelpath	0.30
Texture Average	Average texture depth measured from left and right wheel paths	0.35
Speed	Speed of vehicle in km/h	42
Survey Date	Date of survey in the format <DD-MM-YYYY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NH Numbe	Section Code	Start Chainage	End Chainage	Directio	Lane Numbe	Texture	Texture	Texture	Speed	Survey	Latitud	Longitud
NH00x	ABC-DEF	0.0	0.5	Increasin	L1	0.40	0.30	0.35	20	06-05-	9.9889	78.0267
NH00x	ABC-DEF	0.5	1.0	Increasin	L1	0.60	0.50	0.55	37	06-05-	9.9844	78.0293
NH00x	ABC-DEF	1.0	1.5	Increasin	L1	0.80	0.90	0.85	42	06-05-	9.9834	78.0300
NH00x	ABC-DEF	1.5	2.0	Increasin	L1	0.40	0.40	0.4	46	06-05-	9.9810	78.0307
NH00x	ABC-DEF	2.0	2.5	Increasin	L1	0.30	0.30	0.3	42	06-05-	9.9632	78.0416
NH00x	ABC-DEF	2.5	3.0	Increasin	L1	0.70	0.60	0.65	49	06-05-	9.9538	78.0525
NH00x	ABC-DEF	3.0	3.5	Increasin	L1	0.40	0.50	0.45	42	06-05-	9.9310	78.0564
NH00x	ABC-DEF	3.5	4.5	Increasin	L1	0.90	0.80	0.85	33	06-05-	9.9122	78.0496
NH00x	ABC-DEF	4.5	5.0	Increasin	L1	0.40	0.30	0.35	32	06-05-	9.8904	78.0345

2.5 Skid Resistance

The following table lists the fields which need to be populated for the 'Skid Resistance' attribute. The descriptions of the fields are given below.

Field	Descriptio	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad
Field	**Descriptio**	**Example**
Start Chainage	Chainage of the start point (in km)	0.500
End Chainage	Chainage of the end point (in km)	1.500

Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Lane Number	Number of the lane: L1, L2, R1, R2, etc., L1 being 1st lane on the left from centerline of carriageway, L2 being 2nd lane on the left from centerline and	L1
Skid Left	Skid resistance of pavement measured as skid number, measured from left wheel path	25
Skid Right	Skid resistance of pavement measured as skid number, measured from right	24
Skid Average	Average skid resistance measured from left and right wheel paths	24.5
Speed	Speed of vehicle in km/h	42
Survey Date	Date of survey in the format <DD-MM-YYYY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NH Numbe	Section Code	Start Chainage	End Chainage	Directio	Lane Numbe	Skid Left	Skid Righ	Skid Averag	Speed	Survey	Latitud	Longitud
NH00xx	ABC-DEF	0.0	0.5	Increasin	L1	25.0	24.0	24.5	20	06-05-	9.9889	78.0267
NH00xx	ABC-DEF	0.5	1.0	Increasin	L1	23.0	23.0	23.0	37	06-05-	9.9844	78.0293
NH00xx	ABC-DEF	1.0	1.5	Increasin	L1	23.0	24.0	23.5	42	06-05-	9.9834	78.0300
NH00xx	ABC-DEF	1.5	2.0	Increasin	L1	22.0	22.0	22.0	46	06-05-	9.9810	78.0307
NH00xx	ABC-DEF	2.0	2.5	Increasin	L1	20.0	21.0	20.5	42	06-05-	9.9632	78.0416
NH00xx	ABC-DEF	2.5	3.0	Increasin	L1	24.0	24.0	24.0	49	06-05-	9.9538	78.0525
NH00xx	ABC-DEF	3.0	3.5	Increasin	L1	28.0	28.0	28.0	42	06-05-	9.9310	78.0564
NH00xx	ABC-DEF	3.5	4.5	Increasin	L1	21.0	21.0	21.0	33	06-05-	9.9122	78.0496
NH00xx	ABC-DEF	4.5	5.0	Increasin	L1	25.0	24.0	24.5	32	06-05-	9.8904	78.0345

2.6 Falling Weight Deflectometer(FWD)

The following table lists the fields which need to be populated for the 'FWD' attribute. The descriptions of the fields are given below.

Field	Descriptio	Example
NH Number	New National Highway number	NH0065
Field	**Descriptio**	**Example**

Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Chainage	Chainage of survey point (in km)	0.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Lane Number	Number of the lane: L1, L2, R1, R2, etc., L1 being 1st lane on the left from centerline of carriageway, L2 being 2nd lane on the left from centerline and so on	L1
Air Temperature	Air temperature recorded in °C	33
Surface Temperature	Temperature of the pavement surface, recorded in °C	39.3
Peak Load	Peak impulse load, measured in kN	45.7
Deflection0	Surface deflection at the test load center, measured in	246
Deflection1	Surface deflection at location 1 from the test load center, measured in micron	110
Distance1	Distance of location 1 from the test load center	300
Deflection2	Surface deflection at location 2 from the test load center, measured in micron	153
Distance2	Distance of location 2 from the test load center	600
Deflection3	Surface deflection at location 3 from the test load center, measured in micron	110
Distance3	Distance of location 3 from the test load center	900
Deflection4	Surface deflection at location 4 from the test load center, measured in micron	76
Distance4	Distance of location 4 from the test load center	1200
Deflection5	Surface deflection at location 5 from the test load center, measured in micron	59
Distance5	Distance of location 5 from the test load center	1500
Deflection6	Surface deflection at location 6 from the test load center, measured in micron	44
Distance6	Distance of location 6 from the test load center	1800
Deflection7	Surface deflection at location 7 from the test load center, measured in micron	35
Distance7	Distance of location 7 from the test load center	2100
Deflection8	Surface deflection at location 8 from the test load center, measured in micron	28
Distance8	Distance of location 8 from the test load center	2400
Elastic Modulus BituminousE1	Elastic modulus of bituminous layer, back calculated in MPa	3359
Elastic Modulus GranularE2	Elastic modulus of granular layer, backcalculated in MPa	396
Elastic Modulus SubGradeE3	Elastic modulus of subgrade, back calculated in MPa	90
Field	**Descriptio**	**Example**

Corrected Elastic Modulus BituminousE1	Corrected elastic modulus of bituminous layer in MPa	3424
Corrected Elastic Modulus GranularE2	Corrected elastic modulus of granular layer in MPa	300
Corrected Elastic Modulus SubGrade E3	Corrected elastic modulus of subgrade in MPa	69
Bituminous Layer	Thickness of bituminous layer in mm	105
Base Layer	Thickness of base layer in mm	230
GSB Layer	Thickness of GSB layer in mm	200
Subgrade CBR	CBR of subgrade	0.08
Bituminous Layer Coeffic ient A1	Layer coefficient of the bituminous layer	0.36
Base Layer Coefficient A 2	Layer coefficient of the base layer	0.17
Granular Base Layer Coe fficient A3	Layer coefficient of the GSB layer	0.17
Structural Number	Structural number of the pavement	3.86
Modified Structural Number	Modified structural number including contribution from subgrade	4.85
Survey Date	Date of survey in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NH Numb e r	Sectio nCode	Chainag e	Directi o n	Lane Numb e r	Air Temperatu r e	Surface Temperat ur e	Pe a k Loa d	Deflectio n 0	Deflectio n 1	Locati o n 1	Deflectio n 2
NH00x	ABC-DEF	0.500	RHS	R2	32.6	43.7	45.7	333	188	300	243
NH00x	ABC-DEF	1.000	LHS	L1	29.9	32.6	45.4	317	163	300	217
NH00x	ABC-DEF	1.499	RHS	R1	33.0	39.3	45.7	246	110	300	153
NH00x	ABC-DEF	2.000	LHS	L2	28.7	32.4	46.0	293	130	300	187
NH00x	ABC-DEF	2.500	RHS	R2	33.7	45.8	45.3	429	232	300	316
NH00x	ABC-DEF	3.000	LHS	L1	29.0	33.0	45.7	343	204	300	252
NH00x	ABC-DEF	3.500	RHS	R1	33.5	45.4	44.5	373	194	300	268
NH00x	ABC-DEF	4.010	LHS	L2	28.9	33.5	45.0	348	201	300	254
NH00x	ABC-DEF	4.500	RHS	R2	33.3	40.3	46.0	393	241	300	301

(table continued…)

Location 3	Deflection 3	Location 4	Deflection 4	Location 5	Deflection 5	Location 6	Deflection 6	Location 7	Deflection 7	Location 8	Deflection 8
600	180	900	128	1200	102	1500	75	1800	58	2100	42
600	158	900	104	1200	70	1500	48	1800	38	2100	28
600	110	900	76	1200	59	1500	44	1800	35	2100	28
600	126	900	81	1200	62	1500	44	1800	32	2100	23
600	227	900	152	1200	116	1500	86	1800	71	2100	58
600	196	900	144	1200	117	1500	85	1800	65	2100	48
600	187	900	118	1200	83	1500	47	1800	31	2100	22
600	198	900	135	1200	105	1500	64	1800	42	2100	26
600	231	900	162	1200	123	1500	82	1800	62	2100	46

(table continued...)

Location 8	Elastic Modulus Bitumi	Elastic Modulus Granular	Elastic Modulus SubGrade	Corrected Elastic Modulus Bitumin ous E1	Corrected Elastic Modulus Granular	Corrected Elastic Modulus SubGrade	Bituminous Layer	Base Layer	GSB Layer	Subgrade CBR
2400	6213	185	100	6447	135	78	105	230	200	0.0
2400	5356	195	100	5295	143	78	105	230	200	0.0
2400	3359	396	90	3424	300	69	105	230	200	0.0
2400	4830	226	100	4770	169	78	105	230	200	0.0
2400	4570	137	97	4781	93	75	105	230	200	0.0
2400	8454	135	100	8374	91	78	105	230	200	0.0
2400	4394	165	100	4590	117	78	105	230	200	0.0
2400	7817	139	96	7762	95	74	105	230	200	0.0
2400	7666	123	95	7847	81	73	105	230	200	0.0

(table continued...)

Bituminous Layer Coefficient A1	Base Layer	Granular Base Layer Coefficient A3	Structural	Modified Structura	Survey	Latitude	Longitude
0.45	0.13	0.13	3.68	4.82	01-07-	9.98897	78.0267
0.42	0.13	0.13	3.56	4.70	23-06-	9.98444	78.0293
0.36	0.17	0.17	3.86	4.85	01-07-	9.98341	78.0300
0.41	0.14	0.14	3.65	4.79	23-06-	9.98107	78.0307
0.41	0.11	0.11	3.24	4.34	01-07-	9.96328	78.0416
0.49	0.11	0.11	3.58	4.72	23-06-	9.95385	78.0525
0.40	0.12	0.12	3.34	4.48	01-07-	9.93102	78.0564
0.48	0.12	0.12	3.67	4.75	23-06-	9.91229	78.0496
0.48	0.11	0.11	3.53	4.59	01-07-	9.89041	78.0345

2.7 Falling Weight Deflectometer (FWD) Rigid

The following table lists the fields which need to be populated for the 'FWD Rigid' attribute. The descriptions of the fields are given below.

Field	Descriptio	Example
NH Number	New National Highway number	NH0065
Section Code	Code indicating starting and ending locations of section	HYD-VIJ (Hyderabad-Vijayawada)
Chainage	Chainage of the point (in km)	0.500
Direction	Direction of survey • Increasing(chainage) • Decreasing(chainage)	Increasing
Lane Number	Number of the lane: L1, L2, R1, R2, etc.	L2
Air Temperature	Air temperature recorded in °C	30.1
Surface Temperature	Temperature of the pavement surface, recorded in °C	39.4
Peak Load	Peak impulse load, measured in kN	103.7
Deflection1	Surface deflection at the test load center, measured in	140
Deflection2	Surface deflection at 300mm from the test load center, measured in micron	121
Deflection3	Surface deflection at 600mm from the test load center, measured in micron	108
Deflection4	Surface deflection at 900mm from the test load center, measured in micron	101
Concrete Slab Thickness h	Thickness of concrete slab, measured in mm	300
Area of DeflectionBasin	Area of deflection basin, calculated from measured deflections, in cm^2	761
Radius of Relative	Radius of relative stiffness, calculated in mm	823
Normalized Deflectiond 1	Normalized deflection at location 1, in mm	3.1
Normalized Deflectiond 2	Normalized deflection at location 2, in mm	2.9
Normalized Deflectiond 3	Normalized deflection at location 3, in mm	2.4
Normalized Deflectiond 4	Normalized deflection at location 4, in mm	1.9
Modulus of Subgrade Reaction k	Modulus of subgrade reaction, measured in MPa/m	131
Elastic Modulus of Concrete Ec	Elastic modulus of concrete, calculated in MPa	26118
Cube Strength of Concrete fck	Cube strength of concrete, calculated inMPa	27
Flexural strength of concrete fmr	Flexural strength of concrete, calculated in MPa	3.7
Date Of Testing	Date of testing in the format <DD-MM-YY>	06-05-17
Latitude	Latitude of survey point	9.98897
Longitude	Longitude of survey point	78.02671

A sample output is shown below for reference:

NH No	Section Code	Chain -	Direction	Lane No.	Air Temperature	Surface Temperature	Peak Load	Deflection 1	Deflection 2	Deflection 3	Deflection 4	Concrete Slab Thickness h
NH00xx	ABC-DEF	0.0	LHS	L2	29.0	34.9	104.1	167	143	130	119	300
NH00xx	ABC-DEF	0.5	RHS	R2	30.5	38.1	104.4	141	130	122	115	300
NH00xx	ABC-DEF	1.0	LHS	L1	30.0	35.6	105.2	147	111	100	91	300
NH00xx	ABC-DEF	1.5	RHS	R1	28.9	38.3	102.4	140	126	116	107	300
NH00xx	ABC-DEF	2.0	LHS	L2	30.1	39.4	103.7	140	121	108	101	300
NH00xx	ABC-DEF	2.5	RHS	R2	29.0	37.5	104.6	150	134	126	117	300
NH00xx	ABC-DEF	3.0	LHS	L1	30.6	38.9	102.7	124	109	104	92	300
NH00xx	ABC-DEF	3.5	RHS	R1	29.3	39.1	105.9	149	136	128	119	300
NH00xx	ABC-DEF	4.5	RHS	R2	30.3	41.0	104.9	138	127	121	114	300

(table continued...)

Area of Deflection Basin	Radius of Relative Stiffness	Normalized Deflection d1	Normalized Deflection d2	Normalized Deflection d3	Normalized Deflection d4	Modulus of Subgrade Reaction	Elastic Modulus of Concrete Ec	Cube Strength of Concrete fck	Flexural strength of concrete	Date Of Testing	Latitude	Longitude
759	816	3	3	2	2	112	21590	19	3	25-06-	9.98897	78.0267
821	1214	3	3	3	2	62	58161	135	8	28-06-	9.98444	78.0293
684	580	3	3	2	1	246	12051	6	2	25-06-	9.98341	78.0300
796	1014	3	3	3	2	87	39783	63	6	28-06-	9.98107	78.0307
761	823	3	3	2	2	131	26118	27	4	25-06-	9.96328	78.0416
800	1040	3	3	3	2	79	39908	64	6	28-06-	9.95385	78.0525
789	971	3	3	3	2	107	41290	68	6	25-06-	9.93102	78.0564
814	1150	3	3	3	2	66	50086	100	7	28-06-	9.91229	78.0496
826	1257	3	3	3	2	59	64082	164	9	28-06-	9.89041	78.0345

ENCLOSURE-II

Formats for submission of Reports and Documents

1 Standard formats for deliverables

i. During the course of the assignment to prepare detailed project report, several reports, drawings and documents will need to be submitted by the consultants to <Agency>.

ii. For the purposes of submission, format requirements have been laid out for some of the reports and drawing deliverables in this enclosure, which shall be adhered to strictly

iii. In addition, consultants are to align and agree with <Agency> officials the format of submission for all reports, during the inception stage as mentioned in clause 10.2 of this terms of reference

1. Format for submission of report deliverables

1 Printed hard copies of reports

iv. All reports and documents shall be submitted in both printed hard copy and digital formats

v. For hard copies, the consultant shall submit bound volumes (and not in spiral binding form) after completion of each stage of work as per the schedule and in the number of copies as given in Enclosure I.

2 Digital copies of reports

1. Every report shall also be submitted in digital format to the authority in the following formats:

   i. The final report as submitted in the portable document format (.pdf)

   ii. An editable document in the relevant Open Document Format for Office Applications (ODF) and if available the relevant Microsoft Office document format (MS Office)

   iii. All tables and models used to and referred to in the reports shall also be submitted as spread-sheets in the relevant ODF format and MS Office format

   iv. The digital copies of reports shall be submitted in the form of removable storage devices (CD or USB pen drive) and also hosted on a secured online document storage and retrieval platform as described in clause 2 Data products

2. The removable storage device submitted at each deliverable stage shall contain:

   i. Reports for that stage

   ii. All draft and final reports previously submitted

   vi. Correspondence with <Agency>

   vii. Clients' comments on submitted reports

viii. Any communication, letters and approvals to and from other government and local agencies and any other relevant body

ix. An updated index of all the contents on the removable storage device

2. Every submission will be accompanied by a table of contents and index of all documents submitted for ease of reference

2 Data products

1. During the course of the assignment, the consultant shall perform several surveys and collect data that will be used for the design of the road and delivered to the client.

2. Consultants are encouraged to keep commonly available software and data packages, and typical uses for data while deciding final formats of data within the constraints of this document or where a format has not been defined

3. As required in clause 1. (iii) of this Enclosure-II ,consultants are required to agree with <Agency> officials inall actual data formats proposed to be used for the project

4. In order to standardise data formats and simplify hand over and re-use of data, some requirements for minimum content and format are laid down below.

Sr No	Data product	Contents required (definition)	Data format
0	Formats to be used	List of data, drawing and design outputs, reporting format, digital format suggested, key data to be included (column headers), units and system to be used	CSV or ODF sheet, .xlsx optional
1	Traffic surveys		
1.1	List of traffic survey points	Point no, location coordinates (lat, long), location of survey point, chainage, no lanes/type of junction, type of survey, date of survey, length of survey, any commentary, equipment/technique used, link to survey output	CSV or ODF sheet, .xlsx optional
1.2	Classified traffic volume count survey	Survey point, survey location, location id (ihmcl), no of lanes, chainage, location coordinates (lat, long), date, time and period of survey	Raw data: IHMCL Traffic survey data format Processed, corrected with AADT: CSV or ODF sheet, .xlsx optional
1.3	O-D, turning movement, axle load and other surveys	Survey point, survey location, location lat, long, chainage, date, time, period of survey, technique/equipment used in addition to the survey data itself	CSV or ODF sheet, .xlsx optional

Sr No	Data product	Contents required (definition)	Data format
2	Engineering surveys and investigations		
2.1	Raw DGPS data	Notes must contain Date, time of survey, equipment used, corrections applied is any. Data: Survey benchmarks, benchmark points, location data points	CSV or ODF, Receiver Independent Exchange Format (RINEX)
2.2	LiDAR point cloud	Notes must contain Date, time of survey, equipment, summary post processing applied. Data: Survey benchmarks, data points, point cloud of entire project corridor as defined in	LASer file format for exchange CSV sheet, .xlsx optional
2.3	Images	360 Deg/ ortho images of entire project road way	Geographic Tagged Image File Format (GeoTIFF)
2.4	Video	Traverse video of entire project length	Audio video interleave (.avi) or MPEG-4 file (.mp4)
2.5	Topographic map + contours	1:1000 scale map with 50 cm contours with roadway marked on maps	Contours: geo-referenced shape files (.shp) or .dxf files, .dwg/.dgn files options
2.6	Digital elevation model	Digital terrain modeled from aerial and ground surveys	Digital elevation model in USGS Spatial Data transfer standard (SDTS) format
2.7	Longitudinal and cross sections	Location of cross section - existing, design chainage, lat, long, Cross section drawing	.dxf files, .dwg/.dgn files options
2.8	As-is road map	3D digital map of as-is project highway containing earth surface, road layers, utilities, buildings and trees with feature data extracted and mapped in layers, marked on the map and tabulated data provided separately. All road, surface, sub surface inventory, pavement investigation and soil survey data to be super-imposed as layers	Digital terrain model and maps in LandXML/.dxf format, .dwg/.dgn files options Separate CSV or ODF sheet, .xlsx optional of feature data in addition to map

Sr No	Data product	Contents required (definition)	Data format
2.9	Details of utility	type of utility, no, class and category of utility installation (e.g. 66 kV xlpe), location, distance from centerline, user agency	CSV or ODF sheet, .xlsx optional
2.10	Utility maps	geo-referenced schematic map, existing and design road centerline, type of utility, size, no, class and category	georeferenced shape files (.shp) and drawings in .dxf format
2.11	Road inventory surveys	All data as required in clause 4.11.3.1, geo-referencing for each row of data in lat, long form	CSV or ODF sheet
2.12	Pavement investigation	Test pit reference id, location, chainage, geo-reference (lat, long), pavemet composition - layer no, material type, thickness, sub grade type, and condition	CSV or ODF sheet
2.13	Pavement condition survey	Data as required in clause 4.11.3.2, along with location/chainage and geo-reference for all data	CSV or ODF sheet
2.14	Pavement structural strength	FWD results as per IRC guidelines, geo-referencing for test points	CSV or ODF sheet
2.15	Sub-grade and soil strength	In the format of the testing lab, summary details must be tabulated and must include: test pit no, location, chianage, lat/long, date, time of test, tester/lab details, in-situ density, moisture content, field CBR, characterization, in-lab moisture and density, lab CBR	Summary in CSV or ODF sheet
3	Proposed roadway designs		
3.1	Proposed alignment geometry	Georeferenced centerline horizontal and vertical alignment for the road To be presented superimposed on surface map, satellite imagery and digital elevation model of region	Geometry or shape files : .shp/.dxf, .dwg/.dgn files options
3.2	Final alignment geometry	Georeferenced centerline horizontal and vertical alignment for the road. Additional detail on lanes, super elevation, junctions, structures, under/overpasses, PUP/CUP, wayside amenities etc	Geometry or shape files : .shp/.dxf, .dwg/.dgn files options
3.3	Proposed	Proposed digital roadway model and design	.dxf/.dtm

Sr No	Data product	Contents required (definition)	Data format
	roadway model	data- including embankment, road way, road layers, roadside amenities, signals, road furniture, markings and other construction elements in 3D	
3.4	Proposed structures	Geo referenced location and alignment, 3D model of structure and appurtenances, cross section, plan and profile drawings for construction as per IRC	.dxf/.dtm
3.5	Proposed highway cross sections	Roadway cross sections for homogenous sections	.dxf files Digital surface model in .dxf format
4	Other deliverables		
4.1	Digitized cadastral maps	Digitized revenue map overlaid with key landmarks, land size, survey number and ownership data. min 1:1000 scale map with >1mm accuracy	Geometry or shape files : .shp/.dxf, .dwg/.dgn files options
4.2	Financial analysis	Spreadsheet model with instructions, index and containing all inputs and assumptions, time series construction and operating costs, revenues, financing and equity cash flows, NPV/IRR, sensitivity scenarios and results	ODF sheets, MS office .xlsx optional

3 Online hosting and archival of deliverables

3.1 Hosting deliverables online

i. The consultant shall store all deliverables from this assignment on a secure online file hosting platform that is remotely accessible by authorised users on the world wide web

ii. The consultant shall provide read only access to all relevant officers of <Agency> and provide further access to additional users as and when requested by <Agency>

iii. Consultant shall provide a point of contact for access to these files, solving any technical issues and shall respond to all requests in a timely manner

iv. Consultant shall ensure that the files are hosted in a platform that conforms to any file hosting and file sharing security standards as may be laid down by the government of India

3.2 Deliverables to be hosted

i. Data and deliverables to be hosted in an online accessible format shall include but not be limited to:

ii. All draft and final deliverables in the digital formats prescribed in this TOR and in file formats in wide use where formats are not specified

iii. Data, images and videos from all surveys and investigations conductedof this enclosure

iv. All correspondence to and from <Agency> including clients' comments on submitted reports

v. Any communication, letters and approvals to and from other government local agencies and any other relevant body

vi. The platform shall also contain an index and table of contents of information being hosted for ease of access and use

3.3 Time period and costs

i. Access to above mentioned files will be provided till the end of construction (final commercial operations date of contractor/ concessionaire) of all packages that form a part of this assignment at the cost of the consultant

ii. Access to additional users shall also be at no additional cost to the authority

APPENDIX-VII

DRAFT CONTRACT AGREEMENT

Between

<Agency>

<Address>

And

M/s …… in JV with M/s ……

For

Consultancy Services for Project Management <Project Description>

(From km _____**to** km_____of NH in the State of …**)**

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IV. APPENDICES

Appendix A: Terms of reference containing, inter-alia, the Description of the Services and Reporting Requirements

Appendix A1:	Reporting requirement
Appendix B:	Consultants' Sub consultants, Key Personnel and Sub Professional Personnel, Task assignment, work programme, manning schedule, qualification requirements of key personnel, schedule for submission of various report.
Appendix B1:	Medical certificate
Appendix C:	Hours of work for Consultants' Personnel
Appendix D:	Duties of the Client
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CONTRACT FOR CONSULTANTS' SERVICES

Consultancy Services for <Project Description>

(From km _____ **to** km_____ Of NH in the State of ….**)**

This CONTRACT (hereinafter called the "Contract") is made on the ---------- day of the month of ----------2018, between, on the one hand, (<Agency>), New Delhi (hereinafter called the "Client") and,

on the other hand,M/s ---------- in JV with ---------- (hereinafter called the "Consultants").

WHEREAS

(A) the Client has requested the Consultants to provide certain consulting services as defined in the General Conditions attached to this Contract (hereinafter called the "Services");

(B) the Consultants, having represented to the Client that they have the required professional skills, personnel and technical resources, have agreed to provide the Services on the terms andconditions set forth in this Contract;

NOW THEREFORE the parties hereto hereby agree as follows:

1 The following documents attached hereto shall be deemed to form an integral part of this Contract:

(a) The General Conditions of Contract (hereinafter called "GC");

(b) The Special Conditions of contract (hereinafter called "SC");

(c) The following Appendices:

Appendix A: Terms of reference containing, inter-alia, the Description of the Services and Reporting Requirements

Appendix A1: Reporting requirement

Appendix B: Consultants' Sub consultants, Key Personnel and Sub Professional Personnel, Task assignment, work programme, manning schedule, qualification requirements of key personnel, and schedule for submission of various report.

Appendix B1: Medical certificate

Appendix C: Hours of work for Consultants' Personnel

Appendix D: Duties of the Client

Appendix E: Cost Estimate

Appendix F: Copy of letter of invitation

Appendix G: Copy of letter of acceptance

Appendix H: Copy of Bank Guarantee for Performance Security

Appendix-I: Minutes of the pre-bid meeting

Appendix J: Memorandum of Understanding

2. The mutual rights and obligations of the Client and the Consultants shall be as set forth in the Contract; in particular:

(a) The Consultants shall carry out the Services in accordance with the provisions of the Contract; and

(b) Client shall make payments to the Consultants in accordance with the provisions of the Contract.

IN WITNESS WHEREOF, the Parties hereto have caused this Contract to be signed in their respective names as of the day and year first above written.

FOR AND ON BEHALF OF

(<Agency>)

Witness

1. Signature Name

Address

By

Authorized Representative

2. Signature Name

Address

FOR AND ON BEHALF OF

(Consultant)

Witness

1. Signature

Name

Address

By

Authorized Representative
Name

2. Signature

Address

GENERAL CONDITIONS OF CONTRACT

1. GENERAL PROVISIONS

1.1 **Definitions**

Unless the context otherwise requires, the following terms whenever used in this Contract have the following meanings:

(a) "Applicable Law" means the laws and any other instruments having the force of law in the Government's country [or in such other country as may be specified in the Special Conditions of Contract (SC)], as they may be issued and in force from time to time.

(b) "Contract" means the Contract signed by the Parties, to which these General Conditions of Contract are attached, together with all the documents listed in Clause 1 of such signed Contract;

(c) "Effective Date" means the date on which this Contract comes into force and effect pursuant to Clause GC 2.1;

(d) "foreign currency" means any currency other than the currency of the Government;

(e) "GC" means these General Conditions of Contract;

(f) "Government" means the Government of India;

(g) "local currency" means the currency of the Government;

(h) "Consultant" wherever mentioned in this Contract Agreement means the "Project Management Consultant (PMC))" and includes sub-consultants or Associates engaged by the primary consultant.

(i) "Member", in case the Consultants consist of a joint venture or consortium of more than one entity, means any of these entities, and "Members" means all of these entities;

(j) "Personnel" means persons hired by the Consultants or by any Sub-Consultants and or Associates as Employees and assigned to the performance of the Services

Or any part thereof;"Foreign Personnel" means such persons who at the time of being so hired had their domicile outside the Government's Country, "Local Personnel" means such persons who at the time of being so hired had their domicile inside the Government's Country; and 'key personnel' means the personnel referred to in Clause GC 4.2 (a).

(k) "Party" means the Client or the Consultants, as the case may be, and Parties means both of them;

(l) "Services" means the work to be performed by the Consultants pursuant to his contract, as described in Appendix A hereto. The scope of work will be strictly

as given in various Clauses in TOR. The approach and methodology to be adopted by the Consultant for carrying out the assignment as Authority Engineer may be modified depending on the site requirements and work programme of the EPC Contract or after mutual discussions with Employer, the EPC Contractor and the Authority Engineer. The work plan as indicated by the Consultant may be modified accordingly to the site requirements.

(m) "SC" means the Special Conditions of Contract by which these General Conditions of Contract may be amended or supplemented;

(n) "Sub consultant" means any entity to which the Consultants sub contract any part of the Services in accordance with the provisions of Clause GC 3.7; and

(o) "Third Party" means any person or entity other than the Government, the Client, the Consultants or a Sub consultant.

1.2 **Relation between the Parties**

Nothing contained herein shall be construed as establishing a relation of master and servant or of agent and principal as between the Client and the Consultants. The Consultants, subject to this Contract, have complete charge of Personnel performing the Services and shall be fully responsible for the Services performed by them or on their behalf here under.

1.3 **Governing Law and Jurisdiction**

This Contract, its meaning and interpretation, and the relation between the Parties shall be governed by the Applicable Laws of India and the Courts at …….shall have exclusive jurisdiction over matters arising out of or relating to this Agreement.

1.4 **Language**

This Contract has been executed in the language specified in the SC, which shall be the binding and controlling language for all matters relating to the meaning or interpretation of this Contract.

1.5 **Table of Contents and Headings**

The table of contents, headings or sub-headings in this agreement are for convenience for reference only and shall not be used in, and shall not limit, alter or affect the construction and interpretation of this Contract.

1.6 **Notices**

1.6.1 Any notice, request or consent required or permitted to be given or made pursuant to this Contract shall be in writing. Any such notice, request or consent shall be deemed to have been given or made when delivered in person to an authorized representative of the Party to whom the communication is addressed, or when sent by registered mail, facsimile or e-mail to such Party at the address specified in the SC.

1.6.2 Notice will be deemed to be effective as specified in the SC.

1.6.3 A party may change its address for notice hereunder by giving the other Party notice

of such change pursuant to the provisions listed in the SC with respect to Clause GC 1.6.2.

1.7 Location

The Services shall be performed at such locations as are specified in **Letter of Acceptance (Appendix-G)** hereto and, where the location of a particular task is not so specified, at such locations, whether in India or elsewhere, as the Client may approve.

1.8 Authority of Member in Charge

In case the Consultants consist of a joint venture of more than one entity, with or without an Associate the Members hereby authorize the entity specified in the SC to act on their behalf in exercising all the Consultants' rights and obligations towards the Client under this Contract, including without limitation the receiving of instructions and payments from the Client.

1.9 Authorized Representatives

Any action required or permitted to be taken, and any document required or permitted to be executed, under this Contract by the Client or the Consultants may be taken or executed by the officials specified in the SC.

1.10 Taxes and Duties

Unless otherwise specified in the SC, the Consultants, Sub-consultants and Personnel shall pay such taxes, duties, fees and other impositions as may be levied under the Applicable Law. Goods & Service tax as applicable shall be paid to the Authority's Engineer while making payment for services rendered. The consultants shall then deposit the same with the tax authorities and provide a proof of having done so within next 90 days in line with policy circulars issued by Employer.

2. COMMENCEMENT, COMPLETION, MODIFICATION AND TERMINATION OF CONTRACT

2.1 Effectiveness of Contract

This Contract shall come into force and effect on the date (the" Effective Date") of the Client's notice to the Consultants instructing the Consultants to begin carrying out the Services. This notice shall confirm that the effectiveness conditions, if any, listed in the SC have been met.

2.2 Termination of Contract for Failure to Become Effective

If this Contract has not become effective within such time period after the date of the Contract signed by the Parties as shall be specified in the SC, either Party may, by not less than four (4) weeks' written notice to the other Party, declare this Contract to be null and void, and in the event of such a declaration by either Party, neither Party shall have any claim against the other Party with respect hereto.

2.3 **Commencement of Services**

The Consultants shall begin carrying out the Services at the end of such time period after the Effective Date as shall be specified in the SC.

2.4 **Expiration of Contract**

Unless terminated earlier pursuant to Clause GC 2.9 hereof, this Contract shall expire when services have been completed and all payments have been made at the end of such time period after the Effective Date as shall be specified in the SC.

2.5 **Entire Agreement**

This Contract contains all covenants, stipulations and provisions agreed by the Parties. No agent or representative of either Party has authority to make, and the Parties shall not be bound by or be liable for, any statement, representation, promise or agreement not set forth herein.

2.6 **Modification**

Modification of the terms and conditions of this Contract, including any modification of the scope of the Services, may only be made by written agreement between the Parties as the case may be, has been obtained. Pursuant to Clause GC 8.2 hereof, however, each Party shall give due consideration to any proposals for modification made by the other Party.

2.7 **Force Majeure**

2.7.1 **Definition**

(a) For the purposes of this Contract, "Force Majeure" means an event which is beyond the reasonable control of a Party, and which makes a Party's performance of its obligations hereunder impossible or so impractical as reasonably to be considered impossible in the circumstances, and includes, but is not limited to, war, riots, civil disorder, earthquake, fire, explosion, storm, flood or other adverse weather conditions, strikes, lockouts or other industrial action (except where such strikes, lockouts or other industrial action are within the power of the Party invoking Force Majeure to prevent), confiscation or any other action by government agencies.

(b) Force Majeure shall not include (i) any event which is caused by the negligence or intentional action of a Party or such Party's Subconsultants or agents or employees, nor (ii) any event which a diligent Party could reasonably have been expected to both (A) take into account at the time of the conclusion of this Contract and (B) avoid or overcome in the carrying out of its obligations hereunder.

(c) Force Majeure shall not include insufficiency of funds or failure to make any payment required hereunder.

2.7.2 **No Breach of Contract**

The failure of a Party to fulfill any of its obligations hereunder shall not be considered to be a breach of, or default under, this Contract in so far as such inability arises from an event of Force Majuere, provided that the Party affected by such an event has taken

all reasonable precautions, due care and reasonable alternative measures, all with the objective of carrying out the terms and conditions of this Contract.

2.7.3 **Measures to be Taken**

(a) A party affected by an event of Force Majeure shall take all reasonable measures to remove such Party's inability to fulfill its obligations hereunder with a minimum of delay.

(b) A party affected by an event of Force Majuere shall notify the other Party of suchevent as soon as possible, and in any event not later than fourteen (14) days following the occurrence of such event, providing evidence of the nature and cause of such event, and shall similarly give notice of the restoration of normal conditions as soon as possible.

(c) The Parties shall take all reasonable measures to minimize the consequences of any event of Force Majeure.

2.7.4 **Extension of Time**

Any period within which a Party shall, pursuant to this Contract, complete any action or task, shall be extended for a period equal to the time during which such Party was unable to perform such action as a result of Force Majeure.

2.7.5 **Payments**

During the period of their inability to perform the Services as a result of an event of Force Majeure, the Consultants shall be entitled to be reimbursed for additional costs reasonably and necessarily incurred by them during such period for the purposes of the Services and in reactivating the Services after the end of such period.

2.7.6 **Consultation**

Not later than thirty (30) days after the Consultants, as the result of an event of Force Majeure, have become unable to perform a material portion of the Services, the Parties shall consult with each other with a view to agreeing on appropriate measures to be taken in the circumstances.

2.8 **Suspension**

The Client may, by written notice of suspension to the Consultants, suspend all payments to the Consultants hereunder if the Consultants fail to perform any of their obligations under this Contract, including the carrying out of the Services, provided that such notice of suspension (i) shall specify the nature of the failure, and (ii) shall request the Consultants to remedy such failure within a period not exceeding thirty (30) days after receipt by the Consultants of such notice of suspension.

2.9 **Termination**

2.9.1 **By the Client**

The Client may, by not less than thirty (30) days' written notice of termination to the Consultants (except in the event listed in paragraph (f) below, for which there shall be a written notice of not less than sixty (60) days), such notice to be given after the occurrence of any of the events specified in paragraphs (a) through (h) of this Clause

2.9.1, terminate this Contract:

(a) if the Consultants fail to remedy a failure in the performance of their obligations areunder, as specified in a notice of suspension pursuant to Clause 2.8 here in above, within thirty (30) days of receipt of such notice of suspension or within such further period as the Client may have subsequently approved in writing;

(b) if the Consultants become (or, if the Consultants consist of more than one entity, if any of their Members becomes) insolvent or bankrupt or enter into anya greements with their creditors for relief of debt or take advantage of any law for the benefit of debtors or go into liquidation or receivership whether compulsory or voluntary;

(c) if the Consultants fail to comply with any final decision reached as a result of arbitration proceedings pursuant to Clause 8 hereof;

(d) if the Consultants submit to the Client a statement which has a material effect on the rights, obligations or interests of the Client and which the Consultants know to be false;

(e) if, as the result of Force Majeure, the Consultants are unable to perform a material portion of the Services for a period of not less than sixty (60) days; or

(f) if the Client, in its sole discretion and for any reason whatsoever, decides to terminate this Contract.

(g) if the consultant, in the judgment of the Client has engaged in corrupt or fraudulent practices in competing for or in executing the Contract. For the purpose of this clause:

"corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the selection process or in contract execution.

"fraudulent practice" means a misrepresentation of facts in order to influence a selection process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among consultants (prior to or after submission of proposals) designed to establish prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition.

(h) if EPC Contractor represents to Employer that the Consultant is not discharging his duties in a fair, efficient and diligent manner and if the dispute remains unresolved, Employer may terminate this contract.

2.9.2 **By the Consultants**

The Consultants may, by not less than thirty (30) day's written notice to the Client, such notice to be given after the occurrence of any of the events specified in paragraphs (a)

through (d) of this Clause 2.9.2, terminate this Contract:

(a) if the Client fails to pay any money due to the Consultants pursuant to this contract and not subject to dispute pursuant to Clause 8 hereof within forty-five(45) days after receiving written notice from the Consultants that such payment is overdue;

(b) if the Client is in material breach of its obligations pursuant to this Contract and has not remedied the same within forty-five (45) days (or such longer period as the Consultants may have subsequently approved in writing) following the receipt by the Client of the Consultants' notice specifying such breach;

(c) if, as the result of Force Majeure, the Consultant are unable to perform a material portion of the Services for a period of not less than sixty (60) days; or

(d) if the Client fails to comply with any final decision reached as a result of arbitration pursuant to Clause 8 hereof.

2.9.3 **Cessation of Rights and Obligations**

Upon termination of this Contract pursuant to Clauses GC 2.2 or GC 2.9 hereof, or upon expiration of this Contract pursuant to Clause GC 2.4 hereof, all rights and obligations of the Parties hereunder shall cease, except:

(i) such rights and obligations as may have accrued on the date of termination or expiration;

(ii) the obligation of confidentiality set forth in Clause GC 3.3 hereof;

(iii) the Consultants' obligation to permit inspection, copying and auditing of their accounts and records set forth in Clause GC 3.6 (ii) hereof; and

(iv) any right which a Party may have under the Applicable Law

2.9.4 **Cessation of Services**

Upon termination of this Contract by notice of either Party to the other pursuant to Clauses 2.9.1 or 2.9.2 hereof, the Consultants shall, immediately upon dispatch or receipt of such notice, take all necessary steps to bring the Services to a close in a prompt and orderly manner and shall make every reasonable effort to keep expenditures for this purpose to a minimum. With respect to documents prepared by the Consultants and equipment and materials furnished by the Client, the Consultants shall proceed as provided, respectively, by Clauses 3.9 or 3.10 hereof.

2.9.5 **Payment upon Termination**

Upon termination of this Contract pursuant to Clauses 2.9.1 or 2.9.2 hereof, the Client shall make the following payments to the Consultants (after offsetting against these payments any amount that may be due from the Consultant to the Client):

(i) Remuneration pursuant to Clause 6 hereof for Services satisfactorily performed prior to the effective date of termination.

(ii) Reimbursable expenditures pursuant to Clause 6 hereof for expenditures actually incurred prior to the effective date of termination; and

(iii) except in the case of termination pursuant to paragraphs (a) through(d) of Clause 2.9.1 hereof, reimbursement of any reasonable cost incident to the prompt and orderly termination of the Contract including the cost of the return travel of the Consultants' personnel and their eligible dependents.

2.9.6 **Disputes about Events of Termination**

If either Party disputes whether an event specified in paragraphs (a) through (e) of Clause 2.9.1 or in Clause 2.9.2 hereof has occurred, such Party may, within forty-five(45) days after receipt of notice of termination from the other Party, refer the matter to arbitration pursuant to Clause 9 hereof, and this Contract shall not be terminated on account of such event except in accordance with the terms of any resulting arbitral award.

3. OBLIGATIONS OF THE CONSULTANTS

3.1 General

3.1.1 Standard of Performance

The Consultants shall perform the Services and carry out their obligations hereunder with all due diligence, efficiency and economy, in accordance with generally accepted professional techniques and practices, and shall observe sound management practices, and employ appropriate advanced technology and safe and effective equipment, machinery, materials and methods. The Consultants shall always act, in respect of any matter relating to this Contract or to the Services, as faithful advisers to the Client, and shall at all times support and safeguard the Client's legitimate interests in any dealings with Sub consultants or Third Parties.

3.1.2 Law Governing Services

The Consultants shall perform the Services in accordance with the Applicable Law and shall take all practicable steps to ensure that any Sub- consultants and or Associates, as well as the Personnel of the Consultants and any Sub-consultants and or Associates, comply with the Applicable Law. The Client shall advise the Consultants in writing of relevant local customs and the Consultants shall, after such notifications, respect such customs.

3.2 Conflict of Interests

3.2.1 Consultants not to Benefit from Commissions, Discounts, etc.

The Remuneration of the Consultants pursuant to Clause GC6 hereof shall constitute the Consultants' sole remuneration in connection with this Contract or the Services and, subject to Clause GC 3.2.1.1 hereof, the Consultants shall not accept for their own benefit any trade commission, discount or similar payment in connection with activities pursuant to this Contract or to the Services or in the discharge of their obligations hereunder, and the Consultants shall use their best efforts to ensure that any Sub-consultants and or Associates, as well as the Personnel and agents of either of them, similarly shall not receive any such additional remuneration.

3.2.1.1 If the Consultants, as part of the Services, have the responsibility of advising the Client on the procurement of goods, works or services, the Consultants shall comply with any applicable procurement guidelines of the Client (Employer) and or Associates Bank or of the Association, as the case maybe, and other funding agencies and shall at all times exercise such responsibility in the best interest of the Client. Any discounts or commissions obtained by the Consultants in the exercise of such procurement responsibility shall be for the account of the Client.

3.2.2 **Consultants and Affiliates not to be otherwise interested in Project**

The Consultants agree that, during the term of this Contract and after its termination, the Consultants and any entity affiliated with the Consultants, as well as any Subconsultant and any entity affiliated with such Subconsultant, shall be disqualified from providing goods, works or services (other than the Services and any continuation thereof) for any project resulting from or closely related to the Services.

3.2.3 **Prohibition of Conflicting Activities**

Neither the Consultants nor their Subconsultants nor the Personnel of either of them shall engage, either directly or indirectly, in any of the following activities:

(a) during the term of this Contract, any business or professional activities in the Government's country which would conflict with the activities assigned to them under this Contract; or

(b) after the termination of this Contract, such other activities as may be specified in the SC.

3.3 **Confidentiality**

The Consultants, their Subconsultants and the Personnel of either of them shall not, either during the term or within two(2) years after the expiration of this Contract, disclose any proprietary or confidential information relation to the Project, the Services, this Contract or the Client's business or operations without the prior written consent of the Client.

3.4 **Liability of the Consultants**

Subject to additional provisions, if any, set forth in the SC, the Consultants' liability under this Contract shall be as provided by the Applicable Law.

3.5 **Insurance to be taken out by the Consultants**

The Consultants (i) shall take out and maintain, and shall cause any Subconsultants to take out and maintain, at their (or the Subconsultants', as the case may be) own cost buton terms and conditions approved by the Client, insurance against the risks, and for the coverage, as shall be specified in the Special Conditions (SC), and (ii) at the Client'srequest, shall provide evidence to the Client showing that such insurance has been taken out and maintained and that the current premiums therefore have been paid.

3.6 **Accounting, Inspection and Auditing**

The Consultants(i) shall keep accurate and systematic accounts and records in respect of the Services, hereunder, in accordance with internationally accepted accounting principles such as Generally Accepted Accounting Principles (GAAP) and in such form and detail as will clearly identify all relevant time charges and cost, and the bases thereof (including such bases as may be specifically referred to in the SC) ; (ii) shall permit the Client or its designated representative periodically, and upto one year from the expiration or termination of this Contract, to inspect the same and make copies thereof as well as to have them audited by auditors appointed by the Client; and (iii) shall permit the client to inspect the Consultant's accounts and records relating to the performance of the Consultant and to have them audited by auditors appointed by the client.

3.7 **Consultants' Actions requiring Client's prior Approval**

The Consultants shall obtain the Client's prior approval in writing before taking any of the following actions:

(a) Appointing such members of the Personnel as are listed in Appendix B;

(b) entering into a subcontract for the performance of any part of the Services, it being understood (i) that the selection of the Sub-consultant and the terms and conditions of the subcontract shall have been approved in writing by the Client prior to the execution of the subcontract, and (ii) that the Consultants shall remain fully liable for the performance of the Services by the Sub-consultant and its Personnel pursuant to this Contract;

(c) any other action that may be specified in the SC.

3.8 **Reporting Obligations**

The Consultants shall submit to the Client the reports and documents specified in **Appendix A/E** hereto, in the form, in the numbers and within the time periods set forth in the said Appendix. Reporting stages, review progress and checklist shall be as reflected in the DPR.

3.9 **Documents prepared by the Consultants to be the Property of the Client**

All plans, drawings, specifications, designs, reports and other documents prepared by the Consultants in performing the Services shall become and remain the property of the Client, and the Consultants shall, not later than upon termination or expiration of this Contract, deliver all such documents to the Client, together with a detailed inventory thereof. The Consultants may retain a copy of such documents. Restrictions about the future use of these documents, shall be as specified in the SC.

3.10 **Equipment and Materials furnished by the Client**

Equipment and materials made available to the Consultants by the Client, or purchased by the Consultants with funds provided by the Client, shall be the property of the Client and shall be marked accordingly. Upon termination or expiration of this Contract, the Consultants shall make available to the Client an inventory of such equipment and materials and shall dispose of such equipment and materials in accordance with the Client's instructions. While in possession of such equipment and materials, the Consultants, unless otherwise instructed by the Client in writing, shall insure them in an amount equal to their full replacement value.

4. CONSULTANTS' PERSONNEL

4.1 General

The Consultants shall employ and provide such qualified and experienced Personnel as are required to carry out the Services.

4.2 Description of Personnel

(a) The titles, agreed job descriptions, minimum qualification and estimated periods of engagement in the carrying out of the Services of each of the Consultants' Key Personnel are described in Appendix B. If any of the Key Personnel has already been approved by the clients his/her name is listed as well.

(b) If required to comply with the provisions of Clause 3.1.1 of this Contract, adjustments with respect to the estimated periods of engagement of Key Professional / Sub Professional Personnel set forth in Appendix B may be made by the Consultants by written notice to the Client, provided

(i) that such adjustments shall not alter the originally estimated period of engagement of any individual by more than 10% or one week, whichever is larger, and

(ii) that the aggregate of such adjustments shall not cause payments under this Contract to exceed the ceilings set forth in Clause 6.1 (b) of this Contract. Any other such adjustments shall only be made with the Client's written approval.

(c) If additional work is required beyond the scope of the Services specified in Appendix A, the estimated periods of engagement of Key Personnel set forth in Appendix B may be increased by agreement in writing between the Client and the Consultants.

4.3 Approval of Personnel

The Key Personnel i.e. Professional Staff and Sub-consultants listed by title as well as By name in Appendix B are hereby approved by the Client. In respect of other Key Personnel which the Consultants propose, to use in the carrying out of the Services, the Consultants shall submit to the client for review and approval a copy of their biographical data and (in the case of Key personnel to be used within the country of the Government) a copy of a satisfactory medical certificate in the form attached here to as Appendix B1. If the Client does not object in writing (stating the reasons for the objection) within thirty (30) calendar days from the date of receipt of such biographical data and (if applicable) such certificate, such Key Personnel shall be deemed to have been approved by the Client.

4.4 Working Hours, Overtime, Leave, etc.

(a) Working hours and holidays for Key Professional / Sub Professional Personnel are set forth in Appendix C hereto. To account for travel time, foreign Personnel carrying out Services inside the Government's country shall be deemed to have commenced (or finished) work in respect of the Services such number of days before their arrival in (or after their departure from) the Government's country

is specified in Appendix C hereto.

(b) The Key Professional / Sub Professional Personnel shall not be entitled to be paid for overtime nor to take paid sick leave or vacation leave except as specified in Appendix C hereto, and except as specified in such Appendix, the Consultants' remuneration shall be deemed to cover these items. All leave to be allowed to the Personnel is included in the staff- months of service set for in Appendix B. Any taking of leave by Personnel shall be subject to the prior approval of the Client by the Consultants, who shall ensure that absence for leave purposes will not delay the progress and adequate supervision of the Services.

4.5 Removal and/or Replacement of Key Personnel

Removal and/or replacement of Key Personnel shall be regulated as under:

4.5.1 <u>In case notice to commence services pursuant to Clause 2.1 of this Contract is not ordered by Client within 120 days of signing of contract:</u>

The key personnel can excuse themselves on valid grounds, e.g., selection on some other assignment, health problem developed after signing of contract, etc. In such a case no penalty shall be levied on the Firm or on the person concerned. The firm shall however be asked to give a replacement by an equally or better qualified and experienced personnel to the satisfaction of the Authority, whenever mobilization is ordered.

4.5.2 <u>In case notice to commence services is given within 120 days of signing of contract.</u>

It would be preferred that the team leader cum senior Highway Engineer shall continue during all the Phase 1, 2 & 3 of the aggrement.

(i) During phase 3 the team leader shall be equal or better qualification in case the replacement is necessitated. Morover the combined technical score of these 3 key personnels

(i) Resident cum Highway Engineer

(ii) Bridge/Structural Engineer

(iii) Senior Pavement specialist

to be deployed during phase 3 (Construction , Supervision & Maintenance) should be equal or more then the Technical score of 3 key personnels (except team leader) as assessed during the technical evaluation. This would ensure that the evaluated preferred bidder during the evaluation stage remain the preferred bidders even in the phase 3 stage (Construction, Supervision & Maintenance).

(ii) Replacement of team leader and other key personnel are permitted once during Phase III (i.e Supervision and Maintenance stage) without any reduction in remuneration subject to equally or better qualified and experienced personnel being provided to the satisfaction of the Authority. However any further Replacement of all the Key Personnel shall be permitted subject to reduction of remuneration equal to 2 % (two per cent) of the total remuneration specified for the Key Personnel who is proposed to be replaced subject to equally or better qualified and experienced personnel being provided to the satisfaction of the Authority. In case of emergency such as death, serious medical ground the replacement of team leader and other key personnels are permitted without any reduction in remuneration subject to equally or better qualified and experienced personnel being provided to the satisfaction of the Authority. The maximum age limit of replaced key personnel shall be 65 years as on the date of submission of proposal for such replacement.

4.5.3 If the consultant finds that any of the personnel had made false or fake representation regarding his qualification and experience, he may request the Employer for replacement of the personnel. There shall be no reduction in remuneration for such replacement. The replacement shall however be of equal or better score. The personnel so replaced shall be debarred from future projects for 2 years.

4.5.4 Replacement after original contract period is over:

There shall be no limit on the replacements and no reduction in remunerations shall be made. The replacement shall however be of equal or better score.

4.5.5 If the Employer (i) finds that any of the Personnel has committed serious misconduct or has been charged with having committed a criminal action or (ii) has reasonable ground to be dissatisfied with the performance of any of the Personnel, then the consultant shall, at the Employer's written request specifying the grounds therefore, forthwith provide a replacement with qualifications and experience acceptable to him. For such replacement there will be no reduction in remuneration.

4.5.6 If any member of the approved team of a consultant engaged by <Agency> leaves that consultant before completion of the job, he shall be barred for a period of 24 months from being engaged as a team member of any other consultant working (or to be appointed) for any other <Agency>/ MoRTH projects.

4.6 Resident Team Leader and Coordinator

The person designated as the Team Leader of the Consultant's Personnel shall be responsible for the coordinated, timely and efficient functioning of the Personnel. In addition, the Consultant shall designate a suitable person from its Head Office as Project Coordinator who shall be responsible for day to day performance of the Services.

5. OBLIGATION OF THE CLIENT

5.1 Assistance and Exemptions unless otherwise specified in the SC, the Client shall use its best efforts to ensure that the Government shall:

(a) provide the Consultants, Sub consultants and Personnel with work permits and such other documents as shall be necessary to enable the Consultants, Subconsultants or Personnel to perform the Services;

(b) assist for the Personnel and, if appropriate, their eligible dependents to be provided promptly with all supporting papers for necessary entry and exit visas, residence permits, exchange permits and any other documents required for their stay in India;

(c) Facilitate prompt clearance through customs of any property required for the Services;

(d) issue to officials, agents and representatives of the Government all such instructions as may be necessary or appropriate for the prompt and effective implementation of the Services;

Assist the Consultants and the Personnel and any Sub-consultants and or Associates employed by the Consultants for the Services from any requirement to register or obtain any permit to practice their profession or to establish themselves either individually or as a corporate entity according to the Applicable Law;

(a) grant to the Consultants, any Sub-consultants and or Associates and the Personnel of either of them the privilege, pursuant to the Applicable Law, of bringing into Government's country reasonable amounts of foreign currency for the purposes of the Services or for the personal use of the Personnel and their dependents and of withdrawing any such amounts as may be earned therein by the Personnel in the execution of the Services: and

(b) Provide to the Consultants, Sub-consultants and or Associates and Personnel any such other assistance as may be specified in the SC.

5.2 Access to Land

The Client warrants that the Consultants shall have, free of charge, unimpeded access to all land in the Government's country in respect of which access is required for the performance of the Services. The Client will be responsible for any damage to such land or any property thereon resulting from such access and will indemnify the Consultants and each of the Personnel in respect of liability for any such damage, unless such damage is caused by the default or negligence of the Consultants or any Subconsultants or the Personnel of either of them.

5.3 Change in the Applicable Law

If, after the date of this Contract, there is any change in the Applicable Law with respect to taxes and duties which increases or decreases the cost or reimbursable expenses incurred by the Consultants in performing the Services, then the remuneration and reimbursable expenses otherwise payable to the Consultants under this Contract shall be increased or decreased accordingly by agreement between the Parties hereto, and corresponding adjustments shall be made to the ceiling amounts specified in Clause 6.1(b). For any increase or decrease of amount due to change in the Applicable law, a supplementary agreement between the parties shall be executed before making any such payments.

5.4 Services, Facilities and Property of the Client

The client shall make available to the Consultants and the Personnel, for the purposes of the Services and free of any charge, the services, facilities and property described in Appendix D at the times and in the manner specified in said Appendix D, provided that if

such services, facilities and property shall not be made available to the Consultants as and when so specified, the Parties shall agree on (i) any time extension that may be appropriate to grant to the Consultants for the performance of the Services, (ii) the manner in which the Consultants shall procure any such services, facilities and property from other sources, and (iii) the additional payments, if any, to be made to the Consultants as a result thereof pursuant to Clause 6.1(c) herein after.

5.5 Payment

In consideration of the Services performed by the Consultants under this Contract, the Client shall make to the Consultants such payments and in such manner as is provided by Clause 6 of this Contract.

6. PAYMENT TO THE CONSULTANTS

6.1 Cost Estimates: Ceiling Amount

(a) An abstract of the cost of the Services payable in local currency (Indian Rupees) is set forth in Appendix E.

(b) Except as may be otherwise agreed under Clause 2.6 and subject to Clause 6.1(c), the payments under this Contract shall not exceed the ceiling specified in the SC. The Consultants shall notify the Client as soon as cumulative charges incurred for the Services have reached 80% of the ceiling.

(c) Not withstanding Clause 6.1(b) hereof, if pursuant to Clauses 5.4 hereof, the Parties shall agree that additional payments shall be made to the Consultants in order to cover any necessary additional expenditures not envisaged in the cost estimates referred to in Clause 6.1(a) above, the ceiling set forth in Clause 6.1(b) above shall be increased by the amount or amounts, as the case may be, of any such additional payments.

6.2 Currency of Payment

(a) The payment shall be made in Indian Rupees.

6.3 Mode of Billing and Payment

Billing and payments in respect of the Services shall be made as follows:-

(a) The Client shall cause to be paid to the Consultants an advance payment as specified in the SC, and as otherwise set forth below. The advance payment will be due after provision by the Consultants to the Client of a bank guarantee by a bank acceptable to the Client in an amount (or amounts) and in a currency (or currencies) specified in the SC, such bank guarantee (i) to remain effective until the advance payment has been fully set off as provided in the SC, and **ii) in such form as the Client shall have approved in writing.**

(b) Payment Schedule

Phase	Description	Sub-Phase	Key activities	Payment Phase wise %	Payment key activities%
1	Project preparation	1A (Feasibility Study)	Project planning and mobilization		2.0
			Alignment finalization, preliminary surveys		3.5
		1B (DPR)	LA, utilities identification; creation of draft notifications and proposals		3.0
			Detailed design of highway, preparation of detailed project report with drawings	15.0%	3.5
			Preparation of bid documents and technical schedules		3.0
2	Pre-construction activities		Land acquisition process(JMS and 3D reports), obtaining final utilities estimates and required clearances		1.5
			Land acquisition award determination (3G report)	5.0%	1.0
			Obtaining possession of land-Land possession report		1.5
			Mutation related work i.e court case, arbitration		1.0
3	*Construction activity and maintenance*		**A. During Construction** 1. Review and approval of design 2.Supervision of construction work , 3. review of progress work 4. Quality assurance monitoring and supervision test, 5.Arrangement of safety of work/workers/users/ pedestrians 6. Progress of pre-construction activities 7. Clearances from different agencies	80.0%	55.0

Phase	Description	Sub-Phase	Key activities	Payment Phase wise %	Payment key activities%
			B. During maintenance 1) Performance Monitoring through Network Survey Vehicle 2) Inspection of defect and deficiencies 3) Maintenance of the road work 4) Quality assurance during project life 5) Safety aspects		25.0

Note: Consultants have to provide a certificate that all key personnel as envisaged in the Contract Agreement has been actually deployed in the project.They have to submit this certificate at the time of submission of bills to <Agency>from time to time.

* The Concerned Project Director or his authorized representative shall ensure and certify at least 5% test check of all the data collected by the Consultant before releasing the payment to the Consultant.

(c) Beginning 13th months from the bid due date, billing rates shall be increased to cover all items of contract i.e. remuneration, vehicle hire, office rent, consumables, furniture etc. @ 5% every 12 months. However, for evaluation and award of the Bid proposals, the quoted initial rate (as applicable for first 12 months from last date of submission of bid) shall be multiplied by the total time input for each position on this contract, i.e. without considering the increase in the billing rates.

(d) Not withstanding anything to the contrary stated in the GCC and SCC, it shall be mandatory to deploy the key personnel and sub-professional as per the Man- Months Input specified in the Terms of Reference.

(e) Inadequate deployment of key personnel and sub-professional shall lead to 100% deduction in the monthly payment. The key personnel and sub- professional shall be considered to be inadequately deployed if he/she is not present for atleast 90% (excluding holidays) of the time stipulated in the month, as per the Man Months Input in the Terms of Reference and the Deployment Schedule proposed by the firm. For avoidance of doubt, in case the Team Leader cum Senior Highway Engineer has not been made available for 90% of the stipulated time in the month, then no monthly payment shall be released.

(f) All payments shall be made in Indian Rupees and shall be subjected to applicable Indian laws withholding taxes if any.

(g) Payment for Phase-1& 2-[Project preparation and Preconstruction activity]

(i) The payment to the consultant shall be made on deliverable basis as per the payment schedule mentioned in GC 6.3(b). No payment shall become eligible for the next stage till the consultant completes to the satisfaction of the client the work pertaining to the preceding stage. The payment for the work of sub-soil investigation(Boring)will be as per plan approved by the client and will be paid as per actual at the rates quoted by the consultants .The payment for the quantity given by the client for boring will be deemed to be included in the above mentioned payment schedule. Any adjustment in the payment to the consultants will be made in the final payment only.

(ii) The Client shall cause the payment of the Consultants in Para 6.3 (b) above as given in schedule of payment within thirty (30) days after the receipt by the Client of bills. Interests at the rate specified in the SC shall become payable as from the above due date on any amount due by, but not paid on, such due date.

(iii) The final payment under this Clause shall be made only after the final report and a final statement, identified as such, shall have been submitted by the Consultants and approved as satisfactory by the Client. The Services shall be deemed completed and finally accepted by the Client and the final report and final statement shall be deemed approved by the Client as satisfactory one hundred and eighty (180) calendar days after receipt of the final report and final statement by the Client unless the Client, within ninety(90) day period, gives written notice to the Consultants specifying in detailed deficiencies in the Services, the final report or final statement. The Consultants shall thereupon promptly make any necessary corrections, and upon completion of such corrections, the foregoing process shall be repeated. Any amount which the Client has paid or caused to be paid in accordance with this Clause in excess of the amounts actually payable in accordance with the provisions of this Contract shall be reimbursed by the Consultants to the Client within thirty (30) days after receipt by the Consultants of notice thereof. Any such claim by the Client for reimbursement must be made within twelve (12) calendar months after receipt by the Client of a final report and a final statement approved by the Client in accordance with the above.

(iv) All payments under this Contract shall be made to the account of the Consultants specified in the SC.

(v) Efforts need to be made by the Consultant to submit the schedule reports of each road stretch /s of a package. However, due to reasons beyond the reasonable control of Consultant, if the schedule submission of reports / documents of each road stretch /s of a package is not done, the payment shall be made on pro-rata basis.

(h) Payment for Phase-3-[Construction supervision and Maintenance]

(i) (a) During Construction-

The due amount of the consultant's financial proposal for Construction supervision phase as mentioned in GC 6.3 (b) will be converted to the % of Civil work cost quoted by the Civil Contractor and payment will be made in proportionate to the financial progress of Civil work. If the progress of the work may be lagging behind the scheduled milestone due to various reasons such as non-availability of certain parcels of land, forest clearance, poor performance of contractor etc, in such situations/ circumstances, the Authority shall review the requirement of personnel & logistics items commensurate to the progress of the work. Authority, if found necessary reduce the deployment of personnel & logistics. **The payment of remuneration and also of the reimbursable items in such cases may be paid as per the actual deployment of personnel/ logistics duly accounting the modification in the payment as per the payment schedule mentioned in para 6.3(b).Authority may also de-mobilize the Authority's Engineer, if the project is at a standstill.**

(i) (b) During maintenance

The due amuont of the consultant's financial proposal for Maintenaince supervision phase as mentioned in GC 6.3 (b) shall be paid monthly on proportionate basis. Payment shall be deducted at the rate specified in form III of RFP in case consultant do not use required equipment for supervision during maintenance.

Notwithstanding any other provisions in the agreement in this regard, this provision will prevail and override any other provision to the contrary in this agreement.

(ii) As soon as practicable and not later than fifteen (15days) after the end of each calendar month during the period of the Services, the Consultants shall submit to the Client, in duplicate, itemized statements, accompanied by copies of receipted invoices, vouchers and other appropriate supporting materials, of the amounts payable pursuant to Clauses GC6.3 for such month. Each monthly statement shall distinguish that portion of the total eligible costs which pertains to remuneration from that portion which pertains to reimbursable expenditures.

(iii) 75% of bill raised by the Consultant shall be paid within 72 Hrs and remaining bill may be paid after due scrutiny. The Client shall cause the payment of the Consultants periodically as given in schedule of payment above within thirty (30) days after the receipt by the Client of bills with supporting documents. Only such portion of a monthly statement that is not satisfactorily supported may be withheld from payment. Should any discrepancy be found to exist between actual payment and costs authorized to be incurred by the Consultants, the Client may add or subtract the difference from any subsequent payments. Interest at the rate specified in the SC shall become payable as from the above due date on any amount due by, but not paid on such due date.

(iv) The final payment under this Clause shall be made only after the final report and a final statement, identified as such, shall have been submitted by the Consultants and approved as satisfactory by the Client. The Services shall be deemed completed and finally accepted by the Client and the final report and final statement shall be deemed approved by the Client as satisfactory ninety (90) calendar days after receipt of the final report and final statement by the Client unless the Client, within such ninety (90) day period, gives written notice to the Consultants specifying in detail deficiencies in the Services, the final report or final statement. The Consultants shall there upon promptly make any necessary corrections, and upon completion of such corrections, the foregoing process shall be repeated. Any amount which the Client has paid or caused to be paid in accordance with this Clause in excess of the amounts actually payable in accordance with the provisions of this Contract shall be reimbursed by the Consultants to the Client within thirty (30) days after receipt by the Consultants of notice thereof. Any such claim by the Client for reimbursement must be made within twelve (12) calendar months after receipt by the Client of a final report and a final statement approved by the Client in accordance with theabove.

(v) All payments under this Contract shall be made to the account of the Consultants specified in the SC.

(I) "In the event that the construction of the project (under phase 3) occurs prior to the Scheduled Construction completion Date, the Consultant shall be entitled to receive a payment of bonus equivalent to 0.02% (zero point zero two per cent) of the consultancy cost for each day by which the Construction completion Date precedes the Scheduled Construction completion Date, but subject to a maximum of 2% (two per cent) of the consultancy cost. Provided, however, that the payment of bonus, if any, shall be made only after the issue of the Completion Certificate for the Civil work to the Civil Contractor. For the avoidance of the doubt, the Parties agree that for the purpose of determining the bonus payable hereunder, the Consultancy Price shall always be deemed to be the amount specified in Financial Proposal, and shall exclude any revision thereof for any reason."

7. Responsibility for Accuracy of Project Documents

7.1 General

7.1.1 The Consultant shall be responsible for accuracy of the data collected, by him directly or procured from other agencies/authorities, the designs, drawings, estimates and all other details prepared by him as part of these services. He shall indemnify the Authority against any inaccuracy in the work which might surface during implementation of the project. The Consultant will also be responsible for correcting, at his own cost and risk, the drawings including any re-survey / investigations and correcting layout etc. if required during the execution of the Services.

7.1.2 The Consultant shall be fully responsible for the accuracy of design and drawings of the bridges and structures. All the designs and drawings for bridges and structures including all their components shall be fully checked by a Senior Engineer after completion of the designs. All drawings for bridges and structures shall be duly signed by the (a) Designer, (b) Senior Checking Engineer, and (c) Senior Bridge / Structure Expert. The designs and drawings not signed by the three persons mentioned above

shall not be accepted. The Consultant shall indemnify the Client against any inaccuracy / deficiency in the designs and drawings of the bridges and structures noticed during the construction and even thereafter and the Client shall bear no responsibility for the accuracy of the designs and drawings submitted by the Consultants.

7.1.3 The survey control marks established by the Consultant shall be protected by the Consultants till the start of the Construction work.

7.2. Retention Money

An amount equivalent to 5% of the contract value shall be retained at the end of the contract for accuracy of design, quantities submitted & supervision etc. and the same will be released after the completion of civil contract works or after 3 years from completion of consultancy services, whichever is earlier. The retention money will however be released by the Client on substitution by Bank Guarantee of the same amount valid upto the period as above. Out of this 5%, 2.5% shall be in the form of Bank Guarantee and 2.5% shall be the amount retained from Consultancy fee payable to the Consultant.

7.3. Penalty

7.3.1. Penalty for Error/Variation

i. If variation in project cost occurs due to Change of scope requests of **more than 5%** of the total project cost as estimated by the consultant and these change of scope requests arise due to deficiencies in the design provided by the consultant, the penalty equivalent to 1% of the contract value shall be imposed. For this purpose retention money equivalent to 1% of the contract value will be forfeited. This shall exclude any additional/deletion of items/works ordered by the client during the execution

ii. If there is a discrepancy in land to be acquired during the execution of the project upto an extent of +/- 2% of the area of land, a penalty equivalent to 0.75% of the contract value shall be imposed however, above panelty shall not be invoked if discrepancy in land to be acquired is due to fault of revenue authority. For this purpose retention money equivalent to 0.75% of the contract value will be forfeited. This shall exclude any additional/deletion of items/works ordered by the client during the execution. For discrepancy of more than + / - 2% of the area of land to be acquired, the firm shall be declared as non-performing as per para 7.4.2.1.

iii. If there is a variation in quantities of various itmes of utilities shifting during the execution of the project upto an extent of +/- 10% of the quantity estimated by the design consultant, a penalty equivalent to 0.75% of the contract value shall be imposed. For this purpose retention money equivalent to 0.75% of the contract value will be forfeited. This shall exclude any additional/deletion of items/works ordered by the client during the execution

iv) For inaccuracies in survey/investigation/design work the penalties shall be imposed as per details given in Table below:

Sr.No.	Item	Penalty (%age of contract value)
1	Topographic Surveys	0.25 to 0.40
	a) The horizontal alignment does not match with ground condition.	

Sr.No.	Item	Penalty (%age of contract value)
	b) The cross sections do not match with existing ground.	
	c)The co-ordinates are defective as instruments of desired accuracy not used.	
2	Geotechnical Surveys	0.25 to 0.40
	a)Incomplete surveys	
	b) Data not analyzed properly	
	c) The substrata substantially different from the actual strata found during construction.	
3	Traffic data found to be varying by more than 25% on resurvey at a later date, unless there are justifiable reasons.	0.15 to 0.25
4	Axle load data found to be varying by more than 25% on resurvey at a later date, unless there are justifiable reasons.	0.15 to 0.25
5	Structural Designs found to be unsafe or grossly over designed	The firm shall be considered as non-performing as per para 7.4.2.1

7.3.2 Penalty for delay

In case of delay in completion of services, a penalty equal to 0.01% of the contract price per day subject to a maximum 1% of the contract value will be imposed and shall be recovered from payments due/performance security. However in case of delay due to reasons beyond the control of the consultant, suitable extension of time will be granted on case to case basis.

7.3.3 Total amount of recovery from all penalties shall be limited to 4% of the Consultancy Fee.

7.3.4 <Agency> is in process of evolving performance based rating system for DPR Consultants. Performance of Consultants shall be monitored by <Agency> and will be taken into account in technical evaluation of future DPR projects. For this purpose, performance of Consultant in the current project shall also be taken into account to create rating of Consultant.

7.4 ACTION FOR DEFICIENCY IN SERVICES

7.4.1 Consultants liability towards the Client

Consultant shall be liable to indemnify the client for any direct loss or damage accrued or likely to accrue due to deficiency in service rendered by him.

7.4.2.1 Non Performing:

The firm shall be declared as non-performing under following circumstances:

(a) Structural Designs found to be unsafe or grossly over designed.

(b) Change of scope more then +/-10%.

(c) Discrepancy in land to be acquired during the execution of the project more then +/-5%.

(d) Variation in quantities of various itmes ofutilities shifting during the execution of the project more then +/- 20%.

(e) Recommendation for Release of Payment to the contractor and without compliance of contractual obligation.

(f) In the absence of prescribed no of Key Personnel and non reporting of the same to authority.

(g) In the case of major deficiencies in the Detailed Project Report involving time and cost overrun and adverse effect on reputation of <Agency>.

7.4.2.2 **Debarring-**

If the firm is declared as non-performing under any clause 7.4.2.1, the firm will not be eligible for participating in future projects of the Ministry (including NHAI, NHIDCL, BRO, etc.) for a period of 5 years.

8. FAIRNESS AND GOOD FAITH

8.1 Good Faith

The Parties undertake to act in good faith with respect to each other's rights under this Contract and to adopt all reasonable measures to ensure the realization of the objectives of this Contract.

8.2 Operation of the Contract

The Parties recognize that it is impractical in this Contract to provide for every contingency which may arise during the life of the Contract, and the Parties hereby agree that it is their intention that this Contract shall operate fairly as between them, and without detriment to the interest of either of them, and that, if during the term of this Contract either Party believes that this Contract is operating unfairly, the Parties will use their best efforts to agree on such action as may be necessary to remove the cause or causes of such unfairness, but no failure to agree on any action pursuant to this Clause shall give rise to a dispute subject to arbitration in accordance with Clause 9 hereof.

9. SETTLEMENT OF DISPUTES

9.1 Amicable Settlement

The Parties shall use their best efforts to settle amicably all disputes arising out of or in connection with this Contract or the interpretation thereof.

9.2 Dispute Resolution

9.2.1 Any dispute, difference or controversy of whatever nature howsoever arising under or out of or in relation to this Agreement (including its interpretation) between the Parties, and so notified in writing by either Party to the other Party (the **"Dispute"**)

shall, in the first instance, be attempted to be resolved amicably in accordance with the conciliation procedure set forth in Clause 9.3.

9.2.2 The Parties agree to use their best efforts for resolving all Disputes arising under or in respect of this Agreement promptly, equitably and in good faith, and further agree to provide each other with reasonable access during normal business hours to all non – privileged records, information and data pertaining to any dispute.

9.3 Conciliation

In the event of any Dispute between the Parties, either Party may call upon [Chairman of <Agency>] and the Chairman of the Board of Directors of the Consultant or a substitute thereof for amicable settlement, and upon such reference, the said persons shall meet no later than 10(ten) days from the date of reference to discuss and attempt to amicably resolve the Dispute. If such meeting does not take place within the 10(ten) day period or the Dispute is not amicably settled within 15(fifteen) days of the meeting or the Dispute is not resolved as evidenced by the signing of written terms of settlement within 30 (thirty) days of the notice in writing referred to in Clause 9.2.1 or such longer period as may be mutually agreed by the Parties, either Party may refer the Dispute to arbitration in accordance with the Provisions of Clause 9.4.

9.4 Arbitration

9.4.1. Any Dispute which is not resolved amicably by conciliation, as provided in Clause 9.3, shall be finally decided by reference to arbitration by an Arbitral Tribunal appointed in accordance with Clause 9.4.2. Such arbitration shall be held in accordance with the Rules of Arbitration of the International Centre for Alternative Dispute Resolution, New Delhi (the "Rules"), or such other rules as may be mutually agreed by the Parties, and shall be subject to the provisions of the Arbitration and Conciliation Act, 1996 as amended. The venue of such arbitration shall be *** and the language of arbitration proceedings shall be English.**

9.4.2 Each dispute submitted by a Party to arbitration shall be heard by a sole arbitrator to be appointed as per the procedure below

a) Parties may agree to appoint a sole arbitrator or, failing agreement on the identity of such sole arbitrator within thirty(30) days after receipt by the other Party of the proposal of a name for such an appointment by the Party who initiated the proceedings, either Party may apply to the President, Indian Roads Congress, New Delhi for a list of not fewer than five nominees and, on receipt of such list, the Parties shall alternately strike names therefrom, and the last remaining nominee on the list shall be sole arbitrator for the matter in dispute. If the last remaining nominee has not been determined in this manner within sixty (60) days of the date of the list, the president, Indian Roads Congress, New Delhi, shall appoint, upon the request of either Party and from such list or otherwise, a sole arbitrator for the matter in dispute.

9.4.3 **Substitute Arbitrator**

If for any reason an arbitrator is unable to perform his function, a substitute shall be appointed in the same manner as the original arbitrator.

9.4.4 **Qualifications of Arbitrator**

The sole arbitrator selected pursuant to Clause 9.2.1 hereof shall be expert with extensive experience in relation to the matter in dispute. Preference will be given to the person having adequate experience in the Infrastructure Field/ Civil Engineering.

9.4.5 The Arbitrators shall make a reasoned award (the "Award"). Any Award made in any arbitration held pursuant to this Clause 9 shall be final and biding on the Parties as from the date it is made, and the Consultant and the Authority agree and undertake to carry out such Award without delay.

9.4.6 The Consultant and the Authority agree that an Award may be enforced against the Consultant and/or the Authority, as the case may be, and their respective assets wherever situated.

9.4.7. This Agreement and the rights and obligations of the Parties shall remain in full force and effect, pending the Award in any arbitration proceedings hereunder

9.4.8 **Miscellaneous**

In any arbitration proceeding hereunder:

(a) Proceedings shall, unless otherwise agreed by the parties be held in Delhi.

(b) The English language shall be the official language for all purposes;

(c) The decision of sole arbitrator shall be final and binding and shall be enforceable in any court of competent jurisdiction, and the Parties hereby waive any objections to or claims of immunity in respect of such enforcement; and

(d) The schedule of Expenses and Fee payable to the Arbitrator shall be/ as per the Schedule IV of Arbitration & Conciliation Act, 1996 as amended.

In exceptional cases, such as cases involving major legal implications/wider ramifications/higher financial stakes etc. a special fee structure could be fixed in consultation with the Contractor/Supervision Consultants and with the specific approval of the <Agency> before appointment of the Arbitrator,

10. Change of Scope

The change of Scope on account of variation of total length as well as 4 laned length of project Highway from the indicative length as given at Annexure- I of Letter of Invitation of the RFP shall be dealt as follows

i) During the course of consultancy services in case it is considered necessary to increase/decrease the scope of services(of total length or 4 laned length as compared to indicative Length as given in the RFP) by the client the same shall be notified by Change of scope notice. Similarly, if the Consultant determines that change of scope is needed, he shall inform of the same to the Client. The Client will examine and shall either reject the proposal or issue change of scope notice.

ii) The Consultancy fee shall be revised on account of change of scope as below:

- In case the total length of project increase/ decrease up to 10% of indicative length given in the RFP**: No change in Consultancy Fees.**

  In case the increase/ decrease in total length of project is more than 10 % of

the indicative length as given in the RFP**:** The consultancy fee shall be increased/ decreased in the same proportion in which the length of the project road is increased/ decreased beyond 10% .

iii) Increase/decrease in length on account of bypasses shall not be considered as change of scope. However, the total length of the project highway (including bypasses and realignment) along the finally approved alignment shall be compared with the indicative length in the RFP for the purpose of variation.

10.1 The Consultancy fee shall be increased on account of change of scope as below:

a) In case of increase in configuration of Lanes in the project after the submission of Final Report: 10% of the original consultancy charges

b) In case of change of mode of delivery is involved after submission of Final Report / due to revision of specifications / IRC Codes etc.

(i)	Revision of DPR after submission due to changes in IRC codes / specification etc.	0.5% of the original Consultancy charges.
(ii)	Revision of DPR due to changes in mode EPC / BOT / HAM etc	0.5% of the original Consultancy charges.

11. Fake CV

If any case of fake/incorrect/inflated CV is found, it shall be dealt with very severely and would result in all possible penal action including blacklisting of key personnel from future projects of <Agency>. This would also apply even when the consulting firm is not successful in getting the assignment. *In case CV of a person is turned out to be fake/incorrect/inflated during the assignment, the consultancy firms will have to refund the salary and perks drawn including interest @12% per annum in respect of the person apart from other consequences.* In addition to above, 10% of the salary and perks to be refunded shall be recovered from the Firm as penalty.

SPECIAL CONDITIONS OF CONTRACT

Number of GC Clause

A. Amendments of, and Supplements to, Clauses in the General Conditions

1.1(a) The words "**in the Government's country"** are amended to read "**in INDIA"**

1.4 The language is: **English**

1.6.1 The addresses are:

For the Client : <Agency>, <Address>

Attention : <Agency>, <Address>

Extn……; Fax:011-……..

E-mail: <Email>

For the Consultants:

Attention: Name
Designation
Address
Tel: Fax: E-mail address

1.6.2 Notice will be deemed to be effective as follows:

(a) In the case of personal delivery or registered mail, on delivery;

(b) In the case of facsimiles, 24 hours following confirmed transmission.

(c) In case of E mail, 24 hours following confirmed transmission.

(d) In the case of telexes, 24 hours following confirmed transmission;

(e) In the case of telegrams, 24 hours following confirmed transmission; and

1.8 Entity to Act as Member in charge (In case of Joint Venture of Consultants) .....

1.9 The Authorized Representatives are:

For the Client : (--)

Director, <Agency>(--)

For the Consultant: Name

Designation

1.10 The Consultants and the personnel shall pay the taxes, duties, fees, levies and other impositions levied under the existing, amended or enacted laws (prevailing 7 days before the last date of submission of bids) during life of this contract and the Client shall perform such duties in regard to the deduction of such tax as may be lawfully imposed.

2.1 **The effectiveness conditions are the following:**

a) The contract has been approved by <Agency>.

b) The consultant will furnish within 15 days of the issue of Letter of Acceptance (LOA), an unconditional Bank Guarantee equivalent to 2.0% of the total contract value from a Nationalized Bank, IDBI or ICICI/ICICI Bank/Foreign Bank/EXIM Bank / Any Scheduled Commercial Bank approved by RBI having a net worth of not less than Rs. 1000 crore as per latest Annual Report of the Bank. In the case of a Foreign Bank (issued by a Branch in India) the net worth in respect of Indian operations shall only be taken into account. In case of Foreign Bank, the BG issued by Foreign Bank should be counter guaranteed by any Nationalized Bank in India. In case of JV, the BG shall be furnished on behalf of the JV or by the lead member of the JVs towards Performance Security valid for a period of six months beyond the expiry of contract period

2.2 The time period shall be "four months" or such other time period as the parties may agree in writing.

2.3 The time period shall be"fifteen days" or such other time period as the Parties may agree in writing.

2.4 The time period shall be ------ **months** or such other time period as the parties may agree in writing.

2.9.4 **If after finalisation of DPR, if the project has not been awarded within 2.5 years then the consultant is free to exit from the PMC work**

2.9.7 Foreclosure with mutual consent (New Clause)

2.9.7.1 Without prejudice to any provision of this Agreement, the Authority and Consultant may foreclose this Agreement by mutual consent in circumstances which does not constitute either party's default without any liability or consequential future liability for either party.

2.9.7.2 Should a Party intend to foreclose this Agreement by mutual consent, the intending Party shall issue a notice to the other Party and upon issuance of such notice, the other Party may within 15 days from receipt of such notice either agree to such foreclosure or raise objection(s) to the same by intimating either of the two possible positions to the intending Party in writing.

2.9.7.3 If at inception stage or feasibility stage, employer desires to foreclose the contract, the contract will be foreclosed with mutual consent up to that stage. Likewise, the contract may also be foreclosed at any stage/phase and payment due upto that stage only would be payable.

2.9.7.4 Performance of the consultant shall be evaluated after completion of each stage/ phase as mentioned in the clause 6.3(b) of GCC and penalty shall be imposed on the consultant as per clause 7.3.1 and 7.3.2 of GCC, if services of consultant is found deficient. In case authority is not satisfied with the services of the consultant after evaluating its performance as mentioned above, the contract may be foreclosed at any stage/ phase.

2.9.7.5 Any attempt or endeavor for foreclosure by mutual agreement shall be without prejudice to the rights and obligations of the Parties herein and the factum of such an attempt or exercise shall not stop either of the Parties from discharging their contractual obligations under this Agreement.

2.9.7.6 For the avoidance of doubt, it is clarified that such foreclosure will be without prejudice to the Consultant and shall not affect the Consultant in any way if it wishes to bid in future projects of the Authority.

3.4 Limitation of the Consultants' Liability towards the Client

(a) Except in case of negligence or willful misconduct on the part of the Consultants or on the part of any person or firm acting on behalf of the Consultants in carrying out the Services, the Consultants, with respect to damage caused by the Consultants to the Client's property, shall not be liable to the Client:

(i) for any indirect or consequential loss or damage; and

(ii) for any direct loss or damage that exceeds (A) the total payments for Professional Fees and Reimbursable Expenditure made or expected to be made to the Consultants hereunder, or (B) the proceeds the Consultants may be entitled to receive from any insurance maintained by the Consultants to cover such a liability, whichever of (A) or (B) is higher.

(b) This limitation of liability shall not affect the Consultants' liability, if any, for damage to Third Parties caused by the Consultants or any person or firm acting on behalf of the Consultants in carrying out the Services.

3.5 The risks and the coverage shall be as follows:

(a) Third Party motor vehicle liability insurance as required under Motor Vehicles Act, 1988 as amended in respect of motor vehicles operated in India by the Consultants or their Personnel or any Sub consultants or their Personnel for the period of consultancy.

(b) Third Party liability insurance with a minimum coverage, for Rs.1.00 million for the period of consultancy.

(c) (i) The Consultant shall provide to <Agency> Professional Liability Insurance (PLI) for a period of **Five years** beyond completion of Consultancy services or as per Applicable Law, whichever is higher.

(ii) The Consultant will maintain at its expense PLI including coverage for errors and omissions caused by Consultant's negligence in the performance of its duties under this agreement, **(A)** For the amount not exceeding total payments for Professional Fees and Reimbursable Expenditures made or expected to be made to the Consultants hereunder OR **(B)** the proceeds, the Consultants may be entitled to receive from any insurance maintained by the Consultants to cover such a liability, whichever of **(A) or (B) is higher**.

(iii) The policy should be issued only from an Insurance Company operating in India.

(iv) The policy must clearly indicate the limit of indemnity in terms of "Any One Accident" (AOA) and "Aggregate limit on the policy" (AOP) and in no case should be for an amount less than stated in the contract.

(v) If the Consultant enters into an agreement with <Agency> in a joint venture, the policy must be procured and provided to <Agency> by the joint venture entity

and not by the individual partners of the joint venture.

(vi) The contract may include a provision thereby the Consultant does not cancel the policy midterm without the consent of <Agency>. The insurance company may provide an undertaking in this regard.

(d) Employer's liability and workers' compensation insurance in respect of the Personnel of the Consultants and of any Sub consultant, in accordance with the relevant provisions of the Applicable Law, as well as, with respect to such Personnel, any such life, health, accident, travel or other insurance as may be appropriate; and all insurances and policies should start from the date of commencement of services and remain effective as per relevant requirements of contract agreement.

3.7(c) The other actions are

"(i) taking any action under a civil works contract designating the Consultants as "Authority's Engineer", for which action, pursuant to such civil works contract, the written approval of the Client as "Employer" is required".

3.9 The Consultants shall not use these documents for purposes unrelated to this Contract without the prior written approval of the Client.

4.6 The person designated as Team Leader cum Senior Highway Engineer in Appendix B shall serve in that capacity, as specified in Clause 4.6.

6.1 (b) The ceiling amount in local currency is **Rs…… (Excluding Goods & Services Tax)**

6.3 (a) No advance payment will be made.

6.3 **(b) Additional conditions: Payment for Phase-3-[Construction supervision and Maintenance]**

(i) Payment of Authority Engineer shall be released on approval of the monthly reports. Report shall be approved by the Authority only if it includes all the sections prescribed in the format and submitted as per specified timelines.

(ii) Payment shall be released as per rates quoted in Form-III of Appendix-IV- Breakup of Local currency costs.

(iii) For equipment based road inspection to be conducted in O&M phase, payment shall be released as per actual use of equipment on road and rates quoted in Form-III of Appendix-IV- Breakup of Local currency costs.

(iv) If any of the report is found to be misleading or containing incorrect information as determined by the Authority, 10% of payment linked to that report shall be deducted as penalty

(v) It is understood (i) that the remuneration rates shall cover (A) such salaries and allowances as the Consultants shall have agreed to pay to the Personnel as well as factors for social charges and overhead, and (B) the cost of back stopping by home office staff not included in the Personnel listed in Appendix C, and *(C)* the Consultants' fee; (ii) that bonuses or other means of profit-sharing shall not be allowed as an element of overhead, and (iii) that any rates

specified for persons not yet appointed shall be provisional and shall be subject to revision, with the written approval of the Client, once the applicable salaries and allowances are known.

(vi) Remuneration for periods of less than one month shall be calculated on an hourly basis for actual time spent in the Consultants' home office and directly attributable to the Services (one hour being equivalent to 1/240th of a month) and on a calendar-day basis for time spent away from home office (one day being equivalent to 1/30th of a month).

(vii) The rates for foreign and local Personnel are set forth in Appendix E

6.3 (g)(ii) & (h)(ii) The interest rate is: @ 10% per annum

6.3 (g)(iv) & (h)(v) **The account is:**

Account Number: _____

IFSC Code : _____

9.2 Disputes shall be settled by arbitration in accordance with the following provisions:

9.2.1 **Selection of Arbitrators**

Each dispute submitted by a Party to arbitration shall be heard by a sole arbitrator to be appointed as per the procedure below

a) Parties may agree to appoint a sole arbitrator or, failing agreement on the identity of such sole arbitrator within thirty(30) days after receipt by the other Party of the proposal of a name for such an appointment by the Party who initiated the proceedings, either Party may apply to the President, Indian Roads Congress, New Delhi for a list of not fewer than five nominees and, on receipt of such list, the Parties shall alternately strike names therefrom, and the last remaining nominee on the list shall be sole arbitrator for the matter in dispute. If the last remaining nominee has not been determined in this manner within sixty (60) days of the date of the list, the president, Indian Roads Congress, New Delhi, shall appoint, upon the request of either Party and from such list or otherwise, a sole arbitrator for the matter in dispute.

Appendix A

Terms of reference containing, inter-alia, the Description of the Services and Reporting Requirements

Appendix A1: Reporting Requirements

[List format, frequency, contents of reports and number of copies; persons to receive them; dates of submission etc. If no reports are to be submitted, state here "Not applicable".}

Please refer TOR

Appendix B

Consultants' Sub consultants, Key Personnel and Sub Professional Personnel

Appendix B1: Medical Certificate

[Show *here an acceptable form of medical certificate for foreign Personnel to be stationed in India. If there is no need for a medical certificate, state here: "Not applicable.* "]

The form of Medical Certificate as required under the rules of Govt. of India

Appendix C

Hours of work for Consultants' Personnel

The Consultant's personnel shall normally work for 8 hours in a day and six days a week. Normally Sundays shall be closed for working. In addition they shall also be allowed to avail holidays as observed by the Client's office in the relevant state without deduction of remunerations. In case any person is required to work on Sunday or Holiday due to exigency of work, he/she shall be given compensatory leave within the next 15 days.

Appendix D

Duties of the Client

[List here under:

D-1 Services, facilities and property to be made available to the Consultants by the Client.

D-2 Counterpart personnel to be made available to the Consultants by the Client.]

Please refer TOR

Appendix E

Cost Estimate

List hereunder cost estimate in INR:

1. *Monthly rates for local Personnel (Key Personnel and other Personnel)*

2. *Reimbursable/Rental/Fixed expenditures as follows:*

    a. *Cost of local transportation.*

    b. Cost of other local services, rentals, utilities, etc.

Appendix F:

Copy of letter of invitation

Appendix G:

Copy of letter of acceptance

Appendix –H

(PERFORMANCE BANK GUARANTEE)

(Clause-13 of TOR)

To

Address of Employer:

WHEREAS_____[Name and address of Consultants][1] (hereinafter called "the consultants") has undertaken, in pursuance of Contract No._____dated _____to provides the services on terms and conditions set forth in this Contract_____[Name of contract and brief description of works) (hereinafter called the "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Consultants shall furnish you with a Bank Guarantee by a recognized bank for the sum specified there in as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Consultants such a Bank Guarantee;

NOW THEREOF wehere by affirm that we are the Guarantor and responsible to you, on behalf of the Consultants upto a total of [amount of Guarantee][2]_____[inwords], such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of [amount of Guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Consultants before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the services to be performed there under or of any of the Contract documents which may be made between you and the Consultants shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

The liability of the Bank under this Guarantee shall not be affected by any change in the constitution of the consultants or of the Bank.

Notwithstanding anything contained herein before, our liability under this guarantee is restricted to Rs._____(Rs._____) and the guarantee shall remain valid till_____. Unless a claim or a demand in writing is made up on us on or before _____all our liability under this guarantee shall cease.

This guarantee shall be valid for a period of 80 months i.e. upto 2 months beyond the expiry of contract of 78 months.

Signature and Seal of the Guarantor _____In presence of

Name and Designation _____

_____

1.

(Name, Signature & Occupation)

Name of the Bank _____

Address 2. _____

_____

(Name & Occupation)

Date_____

1Give names of all partners if the Consultants is a Joint Venture.

Appendix I: Minutes of Pre-bid meeting

Appendix-J

Memorandum of Understanding

between

_____

And

_____

Whereas the <Agency>/ Ministry of Road Transport & Highways (MoRT&H)/..... State PWD (the '**Employer**') has invited proposal for appointment of Authority's Engineer for _____ (Name of project) hereinafter called the Project.

And Whereas _____ (Lead Partner) and _____ JV partner/s have agreed to form a Joint Venture to provide the said services to the Employer as Authority's Engineer; and

Now, therefore, it is hereby agreed by and on behalf of the partners as follows:

(i) _____ will be the lead partner and _____ will be the other JV partner/s.

(ii) _____ (lead partner) shall be the incharge of overall administration of contract and shall be authorised representative of all JV partners for conducting all business for and on behalf of the JV during the bidding process and subsequently, represent the joint venture for and on behalf of the JV for all contractual matters for dealing with the Employer/EPC Contractor if Consultancy work is awarded to JV.

(iii) All JV partners do hereby undertake to be jointly and severely responsible for all the obligation and liabilities relating to the consultancy work and in accordance with the Terms of Reference of the Request for Proposal for the Consultancy Services.

(iv) Subsequently, if the JV is selected to provide the desired consultancy services, a detailed MOU indicating the specific project inputs and role of each partner/s along with percentage sharing of cost of services shall be submitted to the Employer (Consultant may submit the detailed MOU along with percentage sharing of cost at the time of bidding also).

For_____ (Name of Lead partner)

_____

Managing Director/Head of the Firm

Address

For_____ (Name of JV partner/s)

_____

Managing Director/Head of the Firm

Address

For_____ (Name of Associate Partner/s)

DISCLAIMER

The Applicant must read all the instructions in the RFP and submit the same accordingly.

APPENDIX-VIII

DPR Checklist – Stage 1 – Inception Report (Pavements)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details / Specifications	Remarks
1	**Executive Summary**	Yes ☐ No ☐ NA ☐	NA	
2	**Project Appreciation**	Yes ☐ No ☐ NA ☐	NA	
2.1	Location of site office	Yes ☐ No ☐ NA ☐		
2.2	Review of scope of ToR and gap identification	Yes ☐ No ☐ NA ☐	NA	
2.3	Key departments identified for various documents	Yes ☐ No ☐ NA ☐		
2.4	Start and end location of project verified with client (Mention details)	Yes ☐ No ☐ NA ☐		
2.5	Project description • Start and End Chainage • Village/District	Yes ☐ No ☐ NA ☐		
2.6	Project location map • On State Map • On District Map	Yes ☐ No ☐ NA ☐	NA	
2.7	Site photos and data of project alignment	Yes ☐ No ☐ NA ☐	NA	
2.8	Overview of land use plans	Yes ☐ No ☐ NA ☐	NA	
2.9	Overview of existing pavement conditions • Number of Lanes • Type of Pavement (Flexible/Rigid/Surfaced/ Unsurfaced)	Yes ☐ No ☐ NA ☐		
2.10	Existing right of way details	Yes ☐ No ☐ NA ☐		
2.11	Number/ Location of major and minor bridges	Yes ☐ No ☐ NA ☐		
2.12	Number/ Location of level crossings	Yes ☐ No ☐ NA ☐		
2.13	Number/ Location of ROB and RUB	Yes ☐ No ☐ NA ☐		

S.No	SECTION OF THE REPORT	YES/NO/NA	Details / Specifications	Remarks
2.14	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
3	**Approach Methodology**	Yes ☐ No ☐ NA ☐	NA	
3.1	Engineering survey and investigations	Yes ☐ No ☐ NA ☐	NA	
3.2	Design of road, pavements and structures	Yes ☐ No ☐ NA ☐	NA	
3.3	Environment and social impact assessment	Yes ☐ No ☐ NA ☐	NA	
3.4	Estimation of project cost, viability and financing options	Yes ☐ No ☐ NA ☐	NA	
3.5	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
4	**Task Assignment and Manning Schedule**	Yes ☐ No ☐ NA ☐	NA	
4.1	Number of key personnel provided	Yes ☐ No ☐ NA ☐		
4.2	Specific tasks assigned to each key personnel	Yes ☐ No ☐ NA ☐	NA	
4.3	Manning schedule for key personnel	Yes ☐ No ☐ NA ☐	NA	
4.4	Number of key personnel deployed at site	Yes ☐ No ☐ NA ☐		
5	**Performa for data collection**	Yes ☐ No ☐ NA ☐	NA	
6	**Indicative design standards and cross sections**	Yes ☐ No ☐ NA ☐	NA	
7	**Development plans**	Yes ☐ No ☐ NA ☐	NA	
7.1	Overview of development plans being implemented/ proposed by local bodies	Yes ☐ No ☐ NA ☐	NA	
7.2	Overview of impact of such development plans	Yes ☐ No ☐ NA ☐	NA	
8	**Quality Assurance Plan**	Yes ☐ No ☐ NA ☐	NA	
8.1	Engineering surveys and investigation	Yes ☐ No ☐ NA ☐	NA	
8.2	Traffic surveys	Yes ☐ No ☐ NA ☐	NA	
8.3	Material geo-technical and sub-soil investigations	Yes ☐ No ☐ NA ☐	NA	
8.4	Road and pavement investigations	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details / Specifications	Remarks
8.5	Investigation and design of bridges and structures	Yes ☐ No ☐ NA ☐	NA	
8.6	Environment and R&R assessment	Yes ☐ No ☐ NA ☐	NA	
8.7	Economic and financial analysis	Yes ☐ No ☐ NA ☐	NA	
8.8	Drawing and documentation	Yes ☐ No ☐ NA ☐	NA	
8.9	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
8.10	Discussion of draft QAP document with client	Yes ☐ No ☐ NA ☐	NA	
8.11	Approval of final QAP document by client	Yes ☐ No ☐ NA ☐	NA	
9	**Draft design Standards**	Yes ☐ No ☐ NA ☐	NA	
9.1	Geometric design standards of highway (Plain)	Yes ☐ No ☐ NA ☐	NA	
9.2	Geometric design standards of highway (Hilly)	Yes ☐ No ☐ NA ☐	NA	
10	**Conclusions and recommendations**	Yes ☐ No ☐ NA ☐	NA	
10.1	Conclusions and recommendations	Yes ☐ No ☐ NA ☐	NA	
10.2	Report fulfils project objectives and scope as per RFP	Yes ☐ No ☐ NA ☐	NA	
10.3	Report reviewed for errors and omissions	Yes ☐ No ☐ NA ☐	NA	
10.4	Compliance report prepared on client observations	Yes ☐ No ☐ NA ☐	NA	

DPR Checklist – Stage 2 – Feasibility Report (Pavements)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/ NO/ NA	Details / Specifications	Remarks
1	**Executive Summary**	Yes ☐ No ☐ NA ☐	NA	
2	**Overview of client organization / activities**	Yes ☐ No ☐ NA ☐	NA	
3	**Methodology adopted for feasibility study**	Yes ☐ No ☐ NA ☐	NA	
4	**Socioeconomic profile of the project areas**	Yes ☐ No ☐ NA ☐	NA	
4.1	Regional economic profile basis last 10 years data as per IRC	Yes ☐ No ☐ NA ☐	NA	
4.2	Economic profile of project influence area basis last 10 years data as per IRC	Yes ☐ No ☐ NA ☐	NA	
4.3	Socio Economic status of project influence area	Yes ☐ No ☐ NA ☐	NA	
5	**Indicative design standards, methodologies, and specifications**	Yes ☐ No ☐ NA ☐	NA	
6	**Traffic surveys and analysis**	Yes ☐ No ☐ NA ☐	NA	
6.1	Classified traffic volume counts using IHMCL data (7 day data)	Yes ☐ No ☐ NA ☐	NA	
6.2	Traffic projection methodology as per IRC:108	Yes ☐ No ☐ NA ☐	NA	
6.3	Projected Traffic data for 20 years	Yes ☐ No ☐ NA ☐	NA	
6.4	Current and Projected PCU	Yes ☐ No ☐ NA ☐		
6.5	Current and Projected TVU	Yes ☐ No ☐ NA ☐		

S.No	SECTION OF THE REPORT	YES/ NO/ NA	Details / Specifications	Remarks
6.6	Origin destination surveys as per IRC: 102	Yes ☐ No ☐ NA ☐	NA	
6.7	Speed and delay studies as per IRC:102	Yes ☐ No ☐ NA ☐	NA	
6.8	Traffic surveys for the design of road junctions as per data in IRC: SP:41	Yes ☐ No ☐ NA ☐	NA	
6.9	Analysis for replacing railway level crossings with over bridges/ subways	Yes ☐ No ☐ NA ☐	NA	
6.10	Axle load survey as per IRC:SP:19	Yes ☐ No ☐ NA ☐	NA	
6.11	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
6.12	Traffic surveys monitored and reviewed by the client	Yes ☐ No ☐ NA ☐	NA	
7	**Reconnaissance survey**	Yes ☐ No ☐ NA ☐	NA	
7.1	Road Inventory Survey as per IRC:SP:19	Yes ☐ No ☐ NA ☐	NA	
7.2	Review of Road Inventory survey by client	Yes ☐ No ☐ NA ☐	NA	
7.3	Chainage wise details of pavement composition survey	Yes ☐ No ☐ NA ☐	NA	
7.4	Geological Survey • Geological Map of the Area • Seismicity	Yes ☐ No ☐ NA ☐	NA	
7.5	Climatic Conditions • Temperature • Rainfall • Wind	Yes ☐ No ☐ NA ☐	NA	
7.6	Pavement composition and condition survey as per IRC:SP:19	Yes ☐ No ☐ NA ☐	NA	
7.7	Review of pavement composition and condition survey by client	Yes ☐ No ☐ NA ☐	NA	
7.8	Pavement roughness survey as per IRC:SP:16	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/ NO/ NA	Details / Specifications	Remarks
7.9	Review of pavement roughness survey by client	Yes ☐ No ☐ NA ☐	NA	
7.10	Pavement structural strength survey as per IRC:81	Yes ☐ No ☐ NA ☐	NA	
7.11	Review of pavement structural strength survey by client	Yes ☐ No ☐ NA ☐	NA	
7.12	Sub grade characteristics and strengths	Yes ☐ No ☐ NA ☐	NA	
7.13	Topographical survey as per IRC:SP:19 using LiDAR • Gradient • Terrain	Yes ☐ No ☐ NA ☐	NA	
7.14	Review of topographical survey by client	Yes ☐ No ☐ NA ☐	NA	
7.15	Inventory of bridges, culverts and structures	Yes ☐ No ☐ NA ☐	NA	
7.16	Condition survey for bridges, culverts and structures	Yes ☐ No ☐ NA ☐	NA	
7.17	Review of condition survey for bridges, culverts and structures by client	Yes ☐ No ☐ NA ☐	NA	
7.18	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
8	**Geotechnical Survey**	Yes ☐ No ☐ NA ☐	NA	
8.1	Geo-technical and sub-soil explorations as per IRC:78	Yes ☐ No ☐ NA ☐	NA	
8.2	Bore holes dug for every pier and abutment	Yes ☐ No ☐ NA ☐	NA	
8.3	Review of geo-technical and sub-soil explorations by client	Yes ☐ No ☐ NA ☐	NA	
8.4	Field testing, soil sampling, laboratory testing in accordance with BIS/ AASHTO/ BS	Yes ☐ No ☐ NA ☐	NA	
8.5	Recommendation of Foundation Type and Depth	Yes ☐ No ☐ NA ☐	NA	
8.6	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/ NO/ NA	Details / Specifications	Remarks
9	**Hydraulic and Hydrological Survey**	Yes ☐ No ☐ NA ☐	NA	
9.1	Hydraulic and hydrological investigations as per IRC:SP:13 and IRC:5	Yes ☐ No ☐ NA ☐	NA	
9.2	High Flood Level specified	Yes ☐ No ☐ NA ☐	NA	
9.3	Depth of Water Table specified	Yes ☐ No ☐ NA ☐	NA	
9.4	Ponded Water Level specified	Yes ☐ No ☐ NA ☐	NA	
9.5	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
9.6	Review of hydrological investigations by client	Yes ☐ No ☐ NA ☐	NA	
10	**Materials Survey**	Yes ☐ No ☐ NA ☐	NA	
10.1	Materials Survey conducted as per IRC:SP:19	Yes ☐ No ☐ NA ☐	NA	
10.2	Sources of Naturally Occurring Aggregates specified • Details of Borrow Pits with Distance from Project Site • Cost of Material/ Transportation	Yes ☐ No ☐ NA ☐		
10.3	Sources of Manufactured Items specified • Details of suppliers with distance from project site • Cost of material/ transportation	Yes ☐ No ☐ NA ☐	NA	
10.4	Sources of water for construction specified as per IS: 456	Yes ☐ No ☐ NA ☐	NA	
10.5	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
11	**Environmental screening/ preliminary environmental assessment**	Yes ☐ No ☐ NA ☐	NA	
11.1	Analysis basis Initial Environment Examination in IRC: SP: 19	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/ NO/ NA	Details / Specifications	Remarks
11.2	Recommended feasible mitigation measures	Yes ☐ No ☐ NA ☐	NA	
12	**Initial social assessment/ preliminary LA resettlement plan**	Yes ☐ No ☐ NA ☐	NA	
12.1	Analysis basis Initial Environment Examination in IRC: SP: 19	Yes ☐ No ☐ NA ☐	NA	
12.2	Details of consultation with potentially affected persons	Yes ☐ No ☐ NA ☐	NA	
12.3	Names/ Details of consultation with local NGOs	Yes ☐ No ☐ NA ☐		
12.4	Names/ Details of consultation with municipal authorities	Yes ☐ No ☐ NA ☐		
12.5	Preliminary resettlement plan	Yes ☐ No ☐ NA ☐	NA	
12.6	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
13	**Cost estimates**	Yes ☐ No ☐ NA ☐	NA	
13.1	Item rates and rate analysis	Yes ☐ No ☐ NA ☐	NA	
13.2	Escalation	Yes ☐ No ☐ NA ☐	NA	
14	**Economic and financial analysis**	Yes ☐ No ☐ NA ☐	NA	
14.1	Estimated cost details	Yes ☐ No ☐ NA ☐	NA	
14.2	Projected revenues details	Yes ☐ No ☐ NA ☐	NA	
14.3	Assumptions stated	Yes ☐ No ☐ NA ☐	NA	
14.4	Analysis and results (IRR, Sensitivity Analysis, Financial Viability)	Yes ☐ No ☐ NA ☐	NA	
15	**Strip plan and Alignment**	Yes ☐ No ☐ NA ☐	NA	
15.1	Details of center line of proposed highway	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/ NO/ NA	Details / Specifications	Remarks
15.2	Details of existing RoW	Yes ☐ No ☐ NA ☐	NA	
15.3	Details of proposed RoW	Yes ☐ No ☐ NA ☐	NA	
15.4	Details about ownership of land to be acquired	Yes ☐ No ☐ NA ☐	NA	
15.5	Strip plan basis reconnaissance and topographic surveys	Yes ☐ No ☐ NA ☐	NA	
15.6	Strip plan reviewed and approved by the client	Yes ☐ No ☐ NA ☐	NA	
16	**Alignment Options Study**	Yes ☐ No ☐ NA ☐	NA	
16.1	At least two alignments proposed • Details of Alignments on Map	Yes ☐ No ☐ NA ☐	NA	
16.2	Review of options with client	Yes ☐ No ☐ NA ☐	NA	
16.2.1	Review of options with local authority	Yes ☐ No ☐ NA ☐	NA	
16.3	Length of the project along proposed alignment options	Yes ☐ No ☐ NA ☐		
16.4	Land Acquisition required along alignment options	Yes ☐ No ☐ NA ☐		
16.4.1	Environmental impact of each option	Yes ☐ No ☐ NA ☐		
16.4.2	Review of road geometry and safety for each option	Yes ☐ No ☐ NA ☐		
16.5	Cost Estimates of alternatives	Yes ☐ No ☐ NA ☐		
16.6	Recommended Alignment with Justification	Yes ☐ No ☐ NA ☐	NA	
16.7	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
17	**Technical Specifications**	Yes ☐ No ☐ NA ☐	NA	
17.1	MoRTH technical specifications for Roads and Bridge works followed	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/ NO/ NA	Details / Specifications	Remarks
17.2	Details of technical specifications	Yes ☐ No ☐ NA ☐	NA	
18	**Rate Analysis**	Yes ☐ No ☐ NA ☐	NA	
18.1	Rate analysis for all relevant items as per latest SoR	Yes ☐ No ☐ NA ☐	NA	
19	**Cost Estimates**	Yes ☐ No ☐ NA ☐	NA	
19.1	Cost estimates for all relevant items as per latest SoR	Yes ☐ No ☐ NA ☐	NA	
20	**Bill of quantities**	Yes ☐ No ☐ NA ☐	NA	
21	**Conclusions and recommendations**	Yes ☐ No ☐ NA ☐	NA	
21.1	Conclusions and recommendations	Yes ☐ No ☐ NA ☐	NA	
21.2	Report fulfils project objectives and scope as per RFP	Yes ☐ No ☐ NA ☐	NA	
21.3	Report reviewed for errors and omissions	Yes ☐ No ☐ NA ☐	NA	
21.4	Compliance report prepared on client observations	Yes ☐ No ☐ NA ☐	NA	

DPR Checklist – Stage 3 – LA and Clearances I Report (Pavements)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
1	**Executive Summary**	Yes ☐ No ☐ NA ☐	NA	
2	**Strip plan- additional details added**	Yes ☐ No ☐ NA ☐	NA	
2.1	Details of centreline, existing structures, road furniture and other features	Yes ☐ No ☐ NA ☐	NA	
2.2	Widening scheme	Yes ☐ No ☐ NA ☐	NA	
2.3	New construction/ reconstruction of structures and amenities	Yes ☐ No ☐ NA ☐	NA	
2.4	Existing and proposed right of way	Yes ☐ No ☐ NA ☐	NA	
2.5	Clearances impacting each chainage	Yes ☐ No ☐ NA ☐	NA	
3	**Forest Clearance**	Yes ☐ No ☐ NA ☐	NA	
3.1	Requirement for forest clearance identified	Yes ☐ No ☐ NA ☐	NA	
3.2	Date/ Details of initial consultation with competent authority	Yes ☐ No ☐ NA ☐		
3.3	Details/cost of trees being felled basis concerned District Forest Office	Yes ☐ No ☐ NA ☐		
3.4	Date of submission of proposal for forest clearance	Yes ☐ No ☐ NA ☐	NA	
3.5	Review of proposal by client	Yes ☐ No ☐ NA ☐	NA	
4	**Wildlife Clearance**	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
4.1	Requirement for wildlife clearance identified	Yes ☐ No ☐ NA ☐	NA	
4.2	Date/ Details of initial consultation with competent authority	Yes ☐ No ☐ NA ☐		
4.3	Details/cost of trees being felled basis concerned District Forest Office	Yes ☐ No ☐ NA ☐		
4.4	Date of submission of proposal for wildlife clearance	Yes ☐ No ☐ NA ☐		
4.5	Review of proposal by client	Yes ☐ No ☐ NA ☐	NA	
5	**Utility Clearances (Electricity)**	Yes ☐ No ☐ NA ☐	NA	
5.1	Identification of overground utilities	Yes ☐ No ☐ NA ☐	NA	
5.2	Identification of underground utilities using GPR, Induction Locator or equivalent technologies	Yes ☐ No ☐ NA ☐	NA	
5.3	Name/ Details of consultation with local authority/ people	Yes ☐ No ☐ NA ☐		
5.4	Utility relocation plan with existing / proposed location showing existing RoW and topographic details	Yes ☐ No ☐ NA ☐	NA	
5.5	Cost for relocation as per authority	Yes ☐ No ☐ NA ☐		
5.6	Date of proposal submission to competent authority	Yes ☐ No ☐ NA ☐		
5.7	Review of utility relocation plan/ proposal by client	Yes ☐ No ☐ NA ☐	NA	
6	**Utility Clearances (Water)**	Yes ☐ No ☐ NA ☐	NA	
6.1	Identification of overground utilities in RoW	Yes ☐ No ☐ NA ☐	NA	
6.2	Identification of underground utilities using GPR, Induction Locator or equivalent technologies	Yes ☐ No ☐ NA ☐	NA	
6.3	Name/ Details of consultation with local authority/ people	Yes ☐ No ☐ NA ☐		

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
6.4	Utility relocation plan with existing / proposed location showing existing RoW and topographic details	Yes ☐ No ☐ NA ☐	NA	
6.5	Cost for relocation as per authority	Yes ☐ No ☐ NA ☐		
6.6	Date of proposal submission to competent authority	Yes ☐ No ☐ NA ☐	NA	
6.7	Review of utility relocation plan/ proposal by client	Yes ☐ No ☐ NA ☐	NA	
7	**Utility Clearances (Others)**	Yes ☐ No ☐ NA ☐	NA	
7.1	Identification of overground utilities in RoW	Yes ☐ No ☐ NA ☐	NA	
7.2	Identification of underground utilities using GPR, Induction Locator or equivalent technologies	Yes ☐ No ☐ NA ☐	NA	
7.3	Name/ Details of consultation with local authority/ people	Yes ☐ No ☐ NA ☐		
7.4	Utility relocation plan with existing / proposed location showing existing RoW and topographic details	Yes ☐ No ☐ NA ☐	NA	
7.5	Cost for relocation as per authority	Yes ☐ No ☐ NA ☐		
7.6	Date of proposal submission to competent authority	Yes ☐ No ☐ NA ☐		
7.7	Review of utility relocation plan/ proposal by client	Yes ☐ No ☐ NA ☐	NA	
8	**Railway Clearances**	Yes ☐ No ☐ NA ☐	NA	
8.1	Identification of ROB/ RUB on project corridor	Yes ☐ No ☐ NA ☐	NA	
8.2	Initial consultation with competent authority	Yes ☐ No ☐ NA ☐	NA	
8.3	Date of proposal submission to competent authority	Yes ☐ No ☐ NA ☐		
8.4	Review of GAD/ proposal by client	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
9	**Other Clearances**	Yes ☐ No ☐ NA ☐	NA	
9.1	Requirement for other clearances identified	Yes ☐ No ☐ NA ☐	NA	
9.2	Date of proposal submission to competent authority	Yes ☐ No ☐ NA ☐		
9.3	Review of proposal by client	Yes ☐ No ☐ NA ☐	NA	
10	**Land Acquisition**	Yes ☐ No ☐ NA ☐	NA	
10.1	Detailed schedule about acquisition of landholdings as per land records	Yes ☐ No ☐ NA ☐	NA	
10.2	Consultation with affected persons	Yes ☐ No ☐ NA ☐	NA	
10.3	Name/ Details of consultation with NGOs	Yes ☐ No ☐ NA ☐		
10.4	Name/ Details of consultation with concerned government agencies	Yes ☐ No ☐ NA ☐		
10.5	Total land required, land area already available , land to be acquired identified	Yes ☐ No ☐ NA ☐		
10.6	Review of land acquisition using digital cadastral map by client	Yes ☐ No ☐ NA ☐	NA	
10.7	Draft 3a notification submitted	Yes ☐ No ☐ NA ☐	NA	
10.8	Review of 3a notification by client	Yes ☐ No ☐ NA ☐	NA	
10.9	Date of 3a gazette notification	Yes ☐ No ☐ NA ☐		
10.10	Draft 3a notification submitted	Yes ☐ No ☐ NA ☐	NA	
10.11	Review of 3A notification by client	Yes ☐ No ☐ NA ☐	NA	
10.12	Date of 3A gazette notification	Yes ☐ No ☐ NA ☐		
11	**Conclusions and recommendations**	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
11.1	Conclusions and recommendations	Yes ☐ No ☐ NA ☐	NA	
11.2	Report fulfils project objectives and scope as per RFP	Yes ☐ No ☐ NA ☐	NA	
11.3	Report reviewed for errors and omissions	Yes ☐ No ☐ NA ☐	NA	
11.4	Compliance report prepared on client observations	Yes ☐ No ☐ NA ☐	NA	

DPR Checklist – Stage 4 – Detailed Project Report (Pavements)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details / Specifications	Remarks
1	**Main Report**	Yes ☐ No ☐ NA ☐	NA	
2	**Introduction and project background**	Yes ☐ No ☐ NA ☐	NA	
2.1	Overview of project location, project objectives etc.	Yes ☐ No ☐ NA ☐	NA	
2.2	Overview of report structure, deliverables etc.	Yes ☐ No ☐ NA ☐	NA	
3	**Social analysis of the project**	Yes ☐ No ☐ NA ☐	NA	
3.1	Project impact on stakeholders such as local people	Yes ☐ No ☐ NA ☐	NA	
3.2	Project impact on residential, commercial and public properties	Yes ☐ No ☐ NA ☐	NA	
3.3	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
4	**Reconnaissance survey**	Yes ☐ No ☐ NA ☐	NA	
4.1	Geometric Features of the Existing Road Design Speed • Sight distance details • Horizontal Alignment Details • Vertical Alignment Details • Height of Embankment	Yes ☐ No ☐ NA ☐		
4.2	Topographical Survey using LiDAR (or equivalent technology) as per IRC:SP:19 • Gradient • Terrain	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details / Specifications	Remarks
4.3	Pavement composition and condition survey as per IRC:SP:19	Yes ☐ No ☐ NA ☐	NA	
4.4	Pavement roughness survey as per IRC:SP:16	Yes ☐ No ☐ NA ☐	Na	
4.5	Pavement structural strength survey as per IRC:81	Yes ☐ No ☐ NA ☐	NA	
4.6	Geological Survey • Geological Map of the Area • Seismicity	Yes ☐ No ☐ NA ☐	NA	
4.7	Climatic Conditions • Temperature • Rainfall • Wind	Yes ☐ No ☐ NA ☐	NA	
4.8	Land Use along the existing alignment • Map of the Project Area depicting Agricultural/Habitation/Forest Area	Yes ☐ No ☐ NA ☐	NA	
4.9	Details of Existing Structures • Map of the Project Area depicting Hutments/Buildings/Temples/Public Building/Any Other Significant Structure	Yes ☐ No ☐ NA ☐	NA	
4.10	Inventory and condition survey of culverts	Yes ☐ No ☐ NA ☐	NA	
4.11	Geo-technical and sub-soil explorations as per IRC:78	Yes ☐ No ☐ NA ☐	NA	
4.12	Number of Bore holes dug (holes for every pier and abutment)	Yes ☐ No ☐ NA ☐		
4.13	Field testing, soil sampling, laboratory testing as per IRC: 78	Yes ☐ No ☐ NA ☐	NA	
4.14	Recommendation of Foundation Type and Depth	Yes ☐ No ☐ NA ☐		
4.15	Hydrological investigations as per IRC:5	Yes ☐ No ☐ NA ☐	NA	
4.16	High Flood Level specified	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details / Specifications	Remarks
4.17	Depth of Water Table specified	Yes ☐ No ☐ NA ☐	NA	
4.18	Ponded Water Level specified	Yes ☐ No ☐ NA ☐	NA	
4.19	Materials Survey conducted as per IRC:SP:19	Yes ☐ No ☐ NA ☐	NA	
4.20	Sources of Naturally Occurring Aggregates specified • Details of Borrow Pits with Distance from Project Site • Cost of Material/Transportation	Yes ☐ No ☐ NA ☐		
4.20.1	Sources of environmentally friendly construction materials identified as per MoRT&H circular	Yes ☐ No ☐ NA ☐	NA	
4.21	Sources of Manufactured Items specified • Details of Suppliers with Distance from Project Site • Cost of Material/Transportation	Yes ☐ No ☐ NA ☐	NA	
4.22	Source of Water for construction specified as per IS:456	Yes ☐ No ☐ NA ☐	NA	
4.23	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
5	**Traffic studies and demand forecast designs**	Yes ☐ No ☐ NA ☐	NA	
5.1	Classified traffic volume counts using IHMCL data (7 day data)	Yes ☐ No ☐ NA ☐	NA	
5.2	Traffic projection methodology as per IRC:108	Yes ☐ No ☐ NA ☐	NA	
5.3	Projected Traffic data for 20 years	Yes ☐ No ☐ NA ☐	NA	
5.4	Current and Projected PCU	Yes ☐ No ☐ NA ☐		
5.5	Current and Projected TVU	Yes ☐ No ☐ NA ☐		
5.6	Origin destination surveys as per IRC: 102	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details / Specifications	Remarks
5.7	Speed and delay studies as per IRC:102	Yes ☐ No ☐ NA ☐	NA	
5.8	Traffic surveys for the design of road junctions as per data in IRC: SP:41	Yes ☐ No ☐ NA ☐	NA	
5.9	Analysis for replacing railway level crossings with over bridges/ subways	Yes ☐ No ☐ NA ☐	NA	
5.10	Axle load survey as per IRC:SP:19	Yes ☐ No ☐ NA ☐	NA	
5.11	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
5.12	Traffic surveys monitored and reviewed by the client	Yes ☐ No ☐ NA ☐	NA	
6	**Cost estimates**	Yes ☐ No ☐ NA ☐	NA	
6.1	Project costing as per latest SoR	Yes ☐ No ☐ NA ☐	NA	
7	**Environmental aspects**	Yes ☐ No ☐ NA ☐	NA	
7.1	Environment profile of the project region	Yes ☐ No ☐ NA ☐	NA	
7.2	Details of Public consultation at residential and commercial settlements affected	Yes ☐ No ☐ NA ☐	NA	
7.3	Impact analysis and mitigation measures	Yes ☐ No ☐ NA ☐	NA	
8	**Economic and commercial analysis**	Yes ☐ No ☐ NA ☐	NA	
8.1	Estimated cost details	Yes ☐ No ☐ NA ☐	NA	
8.2	Projected revenues details	Yes ☐ No ☐ NA ☐	NA	
8.3	Assumptions stated	Yes ☐ No ☐ NA ☐	NA	
8.4	Analysis and results (IRR, Sensitivity Analysis, Financial Viability)	Yes ☐ No ☐ NA ☐	NA	
8.5	Conclusions and recommendations	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details / Specifications	Remarks
8.6	Financial model shared with client and reviewed	Yes ☐ No ☐ NA ☐	NA	
9	**Conclusions and recommendations**	Yes ☐ No ☐ NA ☐	NA	
9.1	Report fulfils project objectives and scope as per RFP	Yes ☐ No ☐ NA ☐	NA	
9.2	Report reviewed for errors and omissions	Yes ☐ No ☐ NA ☐	NA	
9.3	Compliance report prepared on client observations	Yes ☐ No ☐ NA ☐	NA	
10	**Design Report**	Yes ☐ No ☐ NA ☐	NA	
10.1	Highway improvement proposals	Yes ☐ No ☐ NA ☐	NA	
10.2	Highway geometric designs	Yes ☐ No ☐ NA ☐	NA	
10.3	Roadside drainage	Yes ☐ No ☐ NA ☐	NA	
10.4	Intersections	Yes ☐ No ☐ NA ☐	NA	
10.5	Urban service roads	Yes ☐ No ☐ NA ☐	NA	
10.6	Bus-stops	Yes ☐ No ☐ NA ☐	NA	
10.7	Toll plazas	Yes ☐ No ☐ NA ☐	NA	
10.8	Pedestrian crossings	Yes ☐ No ☐ NA ☐	NA	
10.9	Utility relocation	Yes ☐ No ☐ NA ☐	NA	
10.10	Pavement	Yes ☐ No ☐ NA ☐	NA	
10.11	Structures	Yes ☐ No ☐ NA ☐	NA	
10.12	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details / Specifications	Remarks
10.13	Pavement deflection survey as per IRC 81-1997	Yes ☐ No ☐ NA ☐	NA	
10.14	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
11	**Materials Report**	Yes ☐ No ☐ NA ☐	NA	
11.1	Material investigations as per IRC:10	Yes ☐ No ☐ NA ☐	NA	
11.2	Review of material investigations by client	Yes ☐ No ☐ NA ☐	NA	
11.3	Multiple borrow areas identified	Yes ☐ No ☐ NA ☐	NA	
11.4	Material survey as per IRC: SP: 19	Yes ☐ No ☐ NA ☐	NA	
11.5	Review of material survey by client	Yes ☐ No ☐ NA ☐	NA	
11.6	Geo-technical and sub-soil explorations as per IRC:78	Yes ☐ No ☐ NA ☐	NA	
11.7	Review of geo-technical and sub-soil explorations by client	Yes ☐ No ☐ NA ☐	NA	
11.8	Field testing, soil sampling, laboratory testing in accordance with BIS/ AASHTO/ BS	Yes ☐ No ☐ NA ☐	NA	
11.9	Pavement composition and condition survey as per IRC:SP:19	Yes ☐ No ☐ NA ☐	NA	
11.10	Review of pavement composition and condition survey by client	Yes ☐ No ☐ NA ☐	NA	
11.11	Pavement roughness survey as per IRC:SP:16	Yes ☐ No ☐ NA ☐	NA	
11.12	Review of pavement roughness survey by client	Yes ☐ No ☐ NA ☐	NA	
11.13	Pavement structural strength survey as per IRC:81	Yes ☐ No ☐ NA ☐	NA	
11.14	Review of pavement structural strength survey by client	Yes ☐ No ☐ NA ☐	NA	
11.15	Water sample tests as per MoRTH specifications	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details / Specifications	Remarks
11.16	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
12	**Environmental Assessment Report/ Resettlement and Rehabilitation Plan**	Yes ☐ No ☐ NA ☐	NA	
12.1	Option for alignment alternatives considered and conclusions	Yes ☐ No ☐ NA ☐	NA	
12.2	Land environment data collection and details/ impact/ mitigation measures	Yes ☐ No ☐ NA ☐	NA	
12.3	Air environment data collection and details/ impact/ mitigation measures	Yes ☐ No ☐ NA ☐	NA	
12.4	Water resources details/ impact/ mitigation measures	Yes ☐ No ☐ NA ☐	NA	
12.5	Noise environment details/ impact/ mitigation measures	Yes ☐ No ☐ NA ☐	NA	
12.6	Biological environment details/ impact/ mitigation measures	Yes ☐ No ☐ NA ☐	NA	
12.7	Details of public consultation	Yes ☐ No ☐ NA ☐	NA	
12.8	Environment monitoring and management plan	Yes ☐ No ☐ NA ☐	NA	
12.9	Details of social impact assessment	Yes ☐ No ☐ NA ☐	NA	
12.10	Details of resettlement and rehabilitation action plan	Yes ☐ No ☐ NA ☐	NA	
12.11	Measures to minimize resettlement	Yes ☐ No ☐ NA ☐	NA	
12.12	Details of public consultation with stakeholders	Yes ☐ No ☐ NA ☐	NA	
12.13	Details of implementation arrangement / budget	Yes ☐ No ☐ NA ☐	NA	
12.14	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
13	**Technical Specifications**	Yes ☐ No ☐ NA ☐	NA	
13.1	MoRTH technical specifications for Roads and Bridge works followed	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details / Specifications	Remarks
13.2	Details of technical specifications	Yes ☐ No ☐ NA ☐	NA	
14	**Rate Analysis**	Yes ☐ No ☐ NA ☐	NA	
14.1	Rate analysis for all relevant items as per latest SoR	Yes ☐ No ☐ NA ☐	NA	
15	**Cost Estimates**	Yes ☐ No ☐ NA ☐	NA	
15.1	Cost estimates for all relevant items as per latest SoR	Yes ☐ No ☐ NA ☐	NA	
16	**Bill of quantities**	Yes ☐ No ☐ NA ☐	NA	
17	**Drawing Volume**	Yes ☐ No ☐ NA ☐	NA	
18	**Digital drawings of road**			
18.1	Highway cross sections	Yes ☐ No ☐ NA ☐		
18.2	3D engineered models of: • Road alignment geometry • Proposed highway • Proposed structures	Yes ☐ No ☐ NA ☐		

DPR Checklist – Stage 5 – Technical Schedules (Pavements)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details / Specifications	Remarks
1	**Bid documents- EPC**	Yes ☐ No ☐ NA ☐	NA	
2	**Bid documents- BOT/PPP**	Yes ☐ No ☐ NA ☐	NA	
3	**Bid documents- other, if any**	Yes ☐ No ☐ NA ☐	NA	
4	**Draft concession agreement**	Yes ☐ No ☐ NA ☐	NA	
4	**Schedule D - Specifications and standards**	Yes ☐ No ☐ NA ☐	NA	
5	**Any other relevant details**	Yes ☐ No ☐ NA ☐	NA	

DPR Checklist – Stage 6 – LA and Clearances II Report (Pavements)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
1	**Executive Summary**	Yes ☐ No ☐ NA ☐	NA	
2	**Environment Clearance**	Yes ☐ No ☐ NA ☐	NA	
2.1	Details of public hearings completed	Yes ☐ No ☐ NA ☐		
2.2	Date of final environment clearance by competent authority	Yes ☐ No ☐ NA ☐		
3	**Forest Clearance**	Yes ☐ No ☐ NA ☐	NA	
3.1	Date/ Details of Joint site inspection with DFO/ competent authority	Yes ☐ No ☐ NA ☐		
3.2	Date of Stage I forest clearance approval by competent authority	Yes ☐ No ☐ NA ☐		
3.3	Date of final forest clearance approval by competent authority	Yes ☐ No ☐ NA ☐		
4	**Wildlife Clearance**	Yes ☐ No ☐ NA ☐	NA	
4.1	Date/ Details of joint site inspection with DFO/ competent authority	Yes ☐ No ☐ NA ☐		
4.2	Date of final wildlife clearance approval by competent authority	Yes ☐ No ☐ NA ☐		
5	**Utility Clearances (Electricity)**	Yes ☐ No ☐ NA ☐	NA	
5.1	Date/ Details of Joint site inspection with competent authority	Yes ☐ No ☐ NA ☐		
5.2	Date of estimate submission by competent authority	Yes ☐ No ☐ NA ☐		

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
5.3	Date of estimate approval by competent authority	Yes ☐ No ☐ NA ☐		
5.4	Approved utility shifting proposal including strip plan	Yes ☐ No ☐ NA ☐		
5.5	Details of approved contractors, SoR and deposit details for user agency	Yes ☐ No ☐ NA ☐	NA	
5.6	Utilities checklist, no upgradation certificate attached	Yes ☐ No ☐ NA ☐		
6.2	Date of estimate submission by competent authority	Yes ☐ No ☐ NA ☐		
6.3	Date of estimate approval by competent authority	Yes ☐ No ☐ NA ☐		
6.4	Approved utility shifting proposal including strip plan	Yes ☐ No ☐ NA ☐		
6.5	Details of approved contractors, SoR and deposit details for user agency	Yes ☐ No ☐ NA ☐	NA	
6.6	Utilities checklist, no upgradation certificate attached	Yes ☐ No ☐ NA ☐		
7.2	Date of estimate submission by competent authority	Yes ☐ No ☐ NA ☐		
7.3	Date of estimate approval by competent authority	Yes ☐ No ☐ NA ☐		
7.4	Approved utility shifting proposal including strip plan	Yes ☐ No ☐ NA ☐		
7.5	Details of approved contractors, SoR and deposit details for user agency	Yes ☐ No ☐ NA ☐	NA	
7.6	Utilities checklist, no upgradation certificate attached	Yes ☐ No ☐ NA ☐		
8.2	Date of final approval of GAD by competent authority	Yes ☐ No ☐ NA ☐		
9	**Other Clearances**	Yes ☐ No ☐ NA ☐	NA	
9.1	Date of final approval by competent authority	Yes ☐ No ☐ NA ☐		
10	**Land Acquisition**	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
10.1	Draft 3a notification submitted	Yes ☐ No ☐ NA ☐		
10.2	Review of 3a notification by client	Yes ☐ No ☐ NA ☐		
10.3	Date of 3a gazette notification	Yes ☐ No ☐ NA ☐		
10.4	Draft 3a notification submitted	Yes ☐ No ☐ NA ☐		
10.5	Review of 3A notification by client	Yes ☐ No ☐ NA ☐		
10.6	Date of 3A gazette notification	Yes ☐ No ☐ NA ☐		
10.7	Date of Joint Measurement Survey with competent authority	Yes ☐ No ☐ NA ☐		
10.7.1	Date of survey - village wise	Yes ☐ No ☐ NA ☐	NA	
10.7.2	Land type –by survey number	Yes ☐ No ☐ NA ☐	NA	
10.7.3	Nature of Land –by survey number	Yes ☐ No ☐ NA ☐	NA	
10.7.4	Ownership status of plots- by survey number	Yes ☐ No ☐ NA ☐	NA	
10.7.5	Verification of area to be acquired – by survey number	Yes ☐ No ☐ NA ☐	NA	
10.7.6	List of structures on each plot	Yes ☐ No ☐ NA ☐	NA	
10.7.7	Sketches of updated alignment by village	Yes ☐ No ☐ NA ☐	NA	
10.7.8	Verification from Land revenue department	Yes ☐ No ☐ NA ☐	NA	
10.7.9	Verification by CALA office	Yes ☐ No ☐ NA ☐	NA	

DPR Checklist – Stage 7 – Award determination (Pavements)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
1	**Executive Summary**	Yes ☐ No ☐ NA ☐	NA	
2	**Village level summary**	Yes ☐ No ☐ NA ☐	NA	
2.1	Total private and public land being acquired	Yes ☐ No ☐ NA ☐	NA	
2.2	Variation in area and nature of land against 3D with justification	Yes ☐ No ☐ NA ☐	NA	
2.3	Method used by CALA to arrive at award	Yes ☐ No ☐ NA ☐	NA	
2.4	Date of award by CALA and approval by <Agency> along with valuation report			
2.5	Total award calculated and deviation from RFCTLARR act	Yes ☐ No ☐ NA ☐	NA	
3	**In detail for each Village**	Yes ☐ No ☐ NA ☐	NA	
3.1	Updated land acquisition tracker with status of: • Notifications • Award • Disbursement	Yes ☐ No ☐ NA ☐	NA	
3.2	Valuation report and details of award calculation- verification by state authority to be included	Yes ☐ No ☐ NA ☐	NA	
3.3	Claims report	Yes ☐ No ☐ NA ☐	NA	
3.4	Copies of notifications published	Yes ☐ No ☐ NA ☐	NA	
3.5	Copies of land possession certificates received	Yes ☐ No ☐ NA ☐	NA	
4	**Conclusions and recommendations**	Yes ☐ No ☐ NA ☐	NA	
4.1	Conclusions and recommendations	Yes ☐ No ☐ NA ☐	NA	
4.2	Report fulfils project objectives and scope as per RFP	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
4.3	Report reviewed for errors and omissions	Yes ☐ No ☐ NA ☐	NA	
4.4	Compliance report prepared on client observations	Yes ☐ No ☐ NA ☐	NA	

DPR Checklist – Stage 8 – Land possession report (Pavements)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
1	**Executive Summary**	Yes ☐ No ☐ NA ☐	NA	
2	**Village level summary**	Yes ☐ No ☐ NA ☐	NA	
2.1	Total private and public land being acquired	Yes ☐ No ☐ NA ☐	NA	
2.2	Date of final award by CALA and approval by <Agency>			
2.3	Status of disbursement on date of receipt of Land possession certificate	Yes ☐ No ☐ NA ☐	NA	
2.4	Key issues being faced in completing land acquisition, if any	Yes ☐ No ☐ NA ☐	NA	
3	**In detail for each Village**	Yes ☐ No ☐ NA ☐	NA	
3.1	Updated land acquisition tracker with status of: • Notifications • Award • Disbursement	Yes ☐ No ☐ NA ☐	NA	
3.2	Final award and claims report	Yes ☐ No ☐ NA ☐	NA	
3.3	Copies of notifications published, land possession certificates received	Yes ☐ No ☐ NA ☐	NA	
4	**Conclusions and recommendations**	Yes ☐ No ☐ NA ☐	NA	
4.1	Conclusions and recommendations	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
4.2	Report fulfils project objectives and scope as per RFP	Yes ☐ No ☐ NA ☐	NA	
4.3	Report reviewed for errors and omissions	Yes ☐ No ☐ NA ☐	NA	
4.4	Compliance report prepared on client observations	Yes ☐ No ☐ NA ☐	NA	
5	**GIS Map containing digitsed details of land parcels acquired with all relevant details**	**Yes ☐ No ☐ NA ☐**	**NA**	

Annexure III: Checklists for Structures such as ROB/ RUB

DPR Checklist – Stage 1 – Inception Report (Structures)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
1	**Executive Summary**	Yes ☐ No ☐ NA ☐	NA	
2	**Project Appreciation**	Yes ☐ No ☐ NA ☐	NA	
2.1	Location of site office	Yes ☐ No ☐ NA ☐		
2.2	Review of scope of ToR and gap identification	Yes ☐ No ☐ NA ☐	NA	
2.3	Details of key departments for documents	Yes ☐ No ☐ NA ☐		
2.4	Project description • Existing LC number • Start and End Chainage • Village/District	Yes ☐ No ☐ NA ☐		
2.5	Project location map • On State Map • On District Map • Latitude & Longitude Coordinates of the LC	Yes ☐ No ☐ NA ☐		
2.6	Details of Existing Level Crossing • Number of Railway Tracks • Type of Railway Tracks (Broad/Metre/Narrow) • No. of trains per day	Yes ☐ No ☐ NA ☐		
2.7	Justification for need of an ROB/RUB (on basis of TVU count)	Yes ☐ No ☐ NA ☐	NA	
2.8	Overview of land use plans	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
2.9	Overview of existing pavement conditions • Number of Lanes • Type of Pavement (Flexible/Rigid/Surfaced/Unsurfaced)	Yes ☐ No ☐ NA ☐		
2.10	Existing right of way details	Yes ☐ No ☐ NA ☐		
2.11	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
3	**Approach Methodology**	Yes ☐ No ☐ NA ☐	NA	
3.1	Engineering survey and investigations	Yes ☐ No ☐ NA ☐	NA	
3.2	Design of road, pavements and structures	Yes ☐ No ☐ NA ☐	NA	
3.3	Environment and social impact assessment	Yes ☐ No ☐ NA ☐	NA	
3.4	Estimation of project cost, viability and financing options	Yes ☐ No ☐ NA ☐	NA	
3.5	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
4	**Task Assignment and Manning Schedule**	Yes ☐ No ☐ NA ☐	NA	
4.1	Number of key personnel provided	Yes ☐ No ☐ NA ☐		
4.2	Specific tasks assigned to each key personnel	Yes ☐ No ☐ NA ☐	NA	
4.3	Manning schedule for key personnel	Yes ☐ No ☐ NA ☐	NA	
4.4	Number of key personnel deployed at site	Yes ☐ No ☐ NA ☐		
5	**Performa for data collection**	Yes ☐ No ☐ NA ☐	NA	
6	**Indicative Design standards and cross sections**	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
7	**Development plans**	Yes ☐ No ☐ NA ☐	NA	
7.1	Overview of development plans being implemented/ proposed by local bodies	Yes ☐ No ☐ NA ☐	NA	
7.2	Overview of impact of such development plans	Yes ☐ No ☐ NA ☐	NA	
8	**Quality Assurance Plan**	Yes ☐ No ☐ NA ☐	NA	
8.1	Engineering surveys and investigation	Yes ☐ No ☐ NA ☐	NA	
8.2	Traffic surveys	Yes ☐ No ☐ NA ☐	NA	
8.3	Material geo-technical and sub-soil investigations	Yes ☐ No ☐ NA ☐	NA	
8.4	Road and pavement investigations	Yes ☐ No ☐ NA ☐	NA	
8.5	Investigation and design of bridges and structures	Yes ☐ No ☐ NA ☐	NA	
8.6	Environment and R&R assessment	Yes ☐ No ☐ NA ☐	NA	
8.7	Economic and financial analysis	Yes ☐ No ☐ NA ☐	NA	
8.8	Drawing and documentation	Yes ☐ No ☐ NA ☐	NA	
8.9	Discussion of draft QAP document with client	Yes ☐ No ☐ NA ☐	NA	
8.10	Approval of final QAP document by client	Yes ☐ No ☐ NA ☐	NA	
8.11	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
9	**Draft design standards**	Yes ☐ No ☐ NA ☐	NA	
9.1	Geometric design standards of bridges (Plain)	Yes ☐ No ☐ NA ☐	NA	
9.2	Geometric design standards of bridges (Hilly)	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
9.3	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
10	**Conclusions and recommendations**	Yes ☐ No ☐ NA ☐	NA	
10.1	Conclusions and recommendations	Yes ☐ No ☐ NA ☐	NA	
10.2	Report fulfils project objectives and scope as per RFP	Yes ☐ No ☐ NA ☐	NA	
10.3	Report reviewed for errors and omissions	Yes ☐ No ☐ NA ☐	NA	
10.4	Compliance report prepared on client observations	Yes ☐ No ☐ NA ☐	NA	

DPR Checklist – Stage 2 – Feasibility Report (Structures)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
1	**Executive Summary**	Yes ☐ No ☐ NA ☐	NA	
2	**Overview of client organization / activities**	Yes ☐ No ☐ NA ☐	NA	
3	**Methodology adopted for feasibility study**	Yes ☐ No ☐ NA ☐	NA	
4	**Socio economic profile of the project areas**	Yes ☐ No ☐ NA ☐	NA	
4.1	Regional economic profile basis last 10 years data as per IRC	Yes ☐ No ☐ NA ☐	NA	
4.2	Economic profile of project influence area basis last 10 years data as per IRC	Yes ☐ No ☐ NA ☐	NA	
4.3	Socio Economic status of project influence area	Yes ☐ No ☐ NA ☐	NA	
5	**Indicative design standards, methodologies, and specifications**	Yes ☐ No ☐ NA ☐	NA	
6	**Traffic surveys and analysis**	Yes ☐ No ☐ NA ☐	NA	
6.1	Classified traffic volume counts using IHMCL data (7 day)	Yes ☐ No ☐ NA ☐	NA	
6.2	Traffic projection methodology as per IRC:108	Yes ☐ No ☐ NA ☐	NA	
6.3	Projected Traffic data for 20 years	Yes ☐ No ☐ NA ☐	NA	
6.4	Current and Projected PCU	Yes ☐ No ☐ NA ☐		
6.5	Current and Projected TVU	Yes ☐ No ☐ NA ☐		

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
6.6	Axle load survey as per IRC:SP:19	Yes ☐ No ☐ NA ☐	NA	
6.7	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
6.8	Traffic surveys monitored and reviewed by the client	Yes ☐ No ☐ NA ☐	NA	
7	**Reconnaissance survey**	Yes ☐ No ☐ NA ☐	NA	
7.1	Road Inventory as per IRC:SP:19	Yes ☐ No ☐ NA ☐	NA	
7.2	Review of Road Inventory Survey by client	Yes ☐ No ☐ NA ☐	NA	
7.3	Geometric Features of the Existing Road • Design Speed • Sight distance elements • Horizontal Alignment Details • Vertical Alignment Details • Height of Embankment	Yes ☐ No ☐ NA ☐	NA	
7.4	Topographical Survey as per IRC:SP:19 using LiDAR or equivalent technology • Gradient • Terrain	Yes ☐ No ☐ NA ☐	NA	
7.5	Review of topographical survey by client	Yes ☐ No ☐ NA ☐	NA	
7.6	Pavement composition and condition survey as per IRC:SP:19	Yes ☐ No ☐ NA ☐	NA	
7.7	Geological Survey • Geological Map of the Area • Seismicity	Yes ☐ No ☐ NA ☐	NA	
7.8	Climatic Conditions • Temperature • Rainfall • Wind	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
7.9	Land Use along the existing alignment • Map of the Project Area depicting Agricultural/Habitation/Forest Area	Yes ☐ No ☐ NA ☐	NA	
7.10	Details of Existing Structures • Map of the Project Area depicting Hutments/Buildings/Temples/Public Building/Any Other Significant Structure	Yes ☐ No ☐ NA ☐	NA	
7.11	Inventory and condition survey of culverts	Yes ☐ No ☐ NA ☐	NA	
7.12	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
8	**Geotechnical Survey**	Yes ☐ No ☐ NA ☐	NA	
8.1	Geo-technical and sub-soil explorations as per IRC:78	Yes ☐ No ☐ NA ☐	NA	
8.2	Number of Bore holes dug (holds for every pier and abutment)	Yes ☐ No ☐ NA ☐		
8.3	Review of geo-technical and sub-soil explorations by client	Yes ☐ No ☐ NA ☐	NA	
8.4	Field testing, soil sampling, laboratory testing as per IRC:78	Yes ☐ No ☐ NA ☐	NA	
8.5	Recommendation of Foundation Type and Depth	Yes ☐ No ☐ NA ☐		
8.6	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
9	**Hydraulic & Hydrological Survey**	Yes ☐ No ☐ NA ☐	NA	
9.1	Hydrological investigations as per IRC:5 and IRC: 13	Yes ☐ No ☐ NA ☐	NA	
9.2	High Flood Level specified	Yes ☐ No ☐ NA ☐	NA	
9.3	Depth of Water Table specified	Yes ☐ No ☐ NA ☐	NA	
9.4	Ponded Water Level specified	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
9.5	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
9.6	Review of Hydrological Survey by the client	Yes ☐ No ☐ NA ☐	NA	
10	**Materials Survey**	Yes ☐ No ☐ NA ☐	NA	
10.1	Materials Survey conducted as per IRC:SP:19	Yes ☐ No ☐ NA ☐	NA	
10.2	Sources of Naturally Occurring Aggregates specified • Details of Borrow Pits with Distance from Project Site • Cost of Material/Transportation	Yes ☐ No ☐ NA ☐		
10.3	Sources of Manufactured Items specified • Details of Suppliers with Distance from Project Site • Cost of Material/Transportation	Yes ☐ No ☐ NA ☐	NA	
10.4	Source of Water for construction specified as per IS:456	Yes ☐ No ☐ NA ☐	NA	
10.5	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
11	**Determination of whether ROB or RUB is appropriate**	Yes ☐ No ☐ NA ☐	NA	
11.1	Justification of whether ROB or RUB should be built	Yes ☐ No ☐ NA ☐	NA	
11.2	Review of justification by client	Yes ☐ No ☐ NA ☐	NA	
12	**Alignment Options Study**	Yes ☐ No ☐ NA ☐	NA	
12.1	At least two alignments proposed • Details of Alignments on Map	Yes ☐ No ☐ NA ☐	NA	
12.2	Review of options with client	Yes ☐ No ☐ NA ☐	NA	
12.2.1	Review of options with local authority	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
12.3	Length of the project along proposed alignment options	Yes ☐ No ☐ NA ☐	NA	
12.4	Land Acquisition required along alignment options	Yes ☐ No ☐ NA ☐	NA	
12.5	Cost Estimates of alternatives	Yes ☐ No ☐ NA ☐	NA	
12.6	Recommended Alignment with Justification	Yes ☐ No ☐ NA ☐		
12.7	Skew Angle of Proposed Alignment Specified	Yes ☐ No ☐ NA ☐		
12.7.1	Environmental impact of each option	Yes ☐ No ☐ NA ☐		
12.7.2	Review of road geometry and safety for each option	Yes ☐ No ☐ NA ☐	NA	
12.9	Traffic Diversion Route Specified	Yes ☐ No ☐ NA ☐	NA	
12.10	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
13	**Environmental screening/ preliminary environmental assessment**	Yes ☐ No ☐ NA ☐	NA	
13.1	Analysis basis Initial Environment Examination in IRC: SP: 19	Yes ☐ No ☐ NA ☐	NA	
13.2	Recommended feasible mitigation measures	Yes ☐ No ☐ NA ☐	NA	
14	**Initial social assessment/ preliminary LA resettlement plan**	Yes ☐ No ☐ NA ☐	NA	
14.1	Analysis basis Initial Environment Examination in IRC: SP: 19	Yes ☐ No ☐ NA ☐	NA	
14.2	Details of consultation with potentially affected persons	Yes ☐ No ☐ NA ☐	NA	
14.3	Details of consultation with local NGOs	Yes ☐ No ☐ NA ☐	NA	
14.4	Details of consultation with municipal authorities	Yes ☐ No ☐ NA ☐	NA	
14.5	Preliminary resettlement plan	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
14.6	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
15	**Cost estimates**	Yes ☐ No ☐ NA ☐	NA	
15.1	Item rates and rate analysis	Yes ☐ No ☐ NA ☐	NA	
15.2	Escalation	Yes ☐ No ☐ NA ☐	NA	
16	**Economic and financial analysis**	Yes ☐ No ☐ NA ☐	NA	
16.1	Estimated cost details	Yes ☐ No ☐ NA ☐	NA	
16.2	Projected revenues details	Yes ☐ No ☐ NA ☐	NA	
16.3	Assumptions stated	Yes ☐ No ☐ NA ☐	NA	
16.4	Analysis and results • IRR • Sensitivity Analysis • Financial Viability	Yes ☐ No ☐ NA ☐	NA	
16.5	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
17	**Strip Plan**		NA	
17.1	Details of center line of proposed structure	Yes ☐ No ☐ NA ☐	NA	
17.2	Details of existing RoW	Yes ☐ No ☐ NA ☐		
17.3	Details of proposed RoW	Yes ☐ No ☐ NA ☐		
17.4	Details about ownership of land to be acquired	Yes ☐ No ☐ NA ☐	NA	
17.5	Strip plan basis reconnaissance and topographic surveys	Yes ☐ No ☐ NA ☐	NA	
17.6	Strip plan reviewed and approved by the client	Yes ☐ No ☐ NA ☐	NA	
17.7	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
11	**Strip plan- additional details added**	Yes ☐ No ☐ NA ☐	NA	
11.1	Details of centreline, existing structures, road furniture and other features	Yes ☐ No ☐ NA ☐	NA	
11.2	Widening scheme	Yes ☐ No ☐ NA ☐	NA	
11.3	New construction/ reconstruction of structures and amenities	Yes ☐ No ☐ NA ☐	NA	
11.4	Existing and proposed right of way	Yes ☐ No ☐ NA ☐	NA	
11.5	Clearances impacting each chainage	Yes ☐ No ☐ NA ☐	NA	

DPR Checklist – Stage 3 – LA and Clearances I Report (Structures)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
1	**Executive Summary**	Yes ☐ No ☐ NA ☐	NA	
2	**Environment Clearance**	Yes ☐ No ☐ NA ☐	NA	
2.1	Requirement for environment clearance identified	Yes ☐ No ☐ NA ☐	NA	
2.2	Date/ Details of Initial consultation with competent authority	Yes ☐ No ☐ NA ☐		
2.3	Date of submission of draft EIA report/ proposal for clearance	Yes ☐ No ☐ NA ☐	NA	
2.4	Review of proposal/ EIA report by client	Yes ☐ No ☐ NA ☐	NA	
3	**Forest Clearance**	Yes ☐ No ☐ NA ☐	NA	
3.1	Requirement for forest clearance identified	Yes ☐ No ☐ NA ☐	NA	
3.2	Date/ Details of initial consultation with competent authority	Yes ☐ No ☐ NA ☐		
3.3	Details/cost of trees being felled basis concerned District Forest Office	Yes ☐ No ☐ NA ☐		
3.4	Date of submission of proposal for forest clearance	Yes ☐ No ☐ NA ☐	NA	
3.5	Review of proposal by client	Yes ☐ No ☐ NA ☐	NA	
4	**Wildlife Clearance**	Yes ☐ No ☐ NA ☐	NA	
4.1	Requirement for wildlife clearance identified	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
4.2	Date/ Details of initial consultation with competent authority	Yes ☐ No ☐ NA ☐		
4.3	Details/cost of trees being felled basis concerned District Forest Office	Yes ☐ No ☐ NA ☐		
4.4	Date of submission of proposal for wildlife clearance	Yes ☐ No ☐ NA ☐		
4.5	Review of proposal by client	Yes ☐ No ☐ NA ☐	NA	
5	**Utility Clearances (Electricity)**	Yes ☐ No ☐ NA ☐	NA	
5.1	Identification of overground utilities	Yes ☐ No ☐ NA ☐	NA	
5.2	Identification of underground utilities using GPR, Induction Locator or equivalent technologies	Yes ☐ No ☐ NA ☐	NA	
5.3	Name/ Details of consultation with local authority/ people	Yes ☐ No ☐ NA ☐		
5.4	Utility relocation plan with existing / proposed location showing existing RoW and topographic details	Yes ☐ No ☐ NA ☐	NA	
5.5	Cost for relocation as per authority	Yes ☐ No ☐ NA ☐		
5.6	Date of proposal submission to competent authority	Yes ☐ No ☐ NA ☐		
5.7	Review of utility relocation plan/ proposal by client	Yes ☐ No ☐ NA ☐	NA	
6	**Utility Clearances (Water)**	Yes ☐ No ☐ NA ☐	NA	
6.1	Identification of overground utilities in RoW	Yes ☐ No ☐ NA ☐	NA	
6.2	Identification of underground utilities using GPR, Induction Locator or equivalent technologies	Yes ☐ No ☐ NA ☐	NA	
6.3	Name/ Details of consultation with local authority/ people	Yes ☐ No ☐ NA ☐		

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
6.4	Utility relocation plan with existing / proposed location showing existing RoW and topographic details	Yes ☐ No ☐ NA ☐	NA	
6.5	Cost for relocation as per authority	Yes ☐ No ☐ NA ☐		
6.6	Date of proposal submission to competent authority	Yes ☐ No ☐ NA ☐	NA	
6.7	Review of utility relocation plan/ proposal by client	Yes ☐ No ☐ NA ☐	NA	
7	**Utility Clearances (Others)**	Yes ☐ No ☐ NA ☐	NA	
7.1	Identification of overground utilities in RoW	Yes ☐ No ☐ NA ☐	NA	
7.2	Identification of underground utilities using GPR, Induction Locator or equivalent technologies	Yes ☐ No ☐ NA ☐	NA	
7.3	Name/ Details of consultation with local authority/ people	Yes ☐ No ☐ NA ☐		
7.4	Utility relocation plan with existing / proposed location showing existing RoW and topographic details	Yes ☐ No ☐ NA ☐	NA	
7.5	Cost for relocation as per authority	Yes ☐ No ☐ NA ☐		
7.6	Date of proposal submission to competent authority	Yes ☐ No ☐ NA ☐		
7.7	Review of utility relocation plan/ proposal by client	Yes ☐ No ☐ NA ☐	NA	
8	**Railway Clearances**	Yes ☐ No ☐ NA ☐	NA	
8.1	Identification of ROB/ RUB on project corridor	Yes ☐ No ☐ NA ☐	NA	
8.2	Initial consultation with competent authority	Yes ☐ No ☐ NA ☐	NA	
8.3	Date of proposal submission to competent authority	Yes ☐ No ☐ NA ☐		
8.4	Review of GAD/ proposal by client	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
9	**Other Clearances**	Yes ☐ No ☐ NA ☐	NA	
9.1	Requirement for other clearances identified	Yes ☐ No ☐ NA ☐	NA	
9.2	Date of proposal submission to competent authority	Yes ☐ No ☐ NA ☐		
9.3	Review of proposal by client	Yes ☐ No ☐ NA ☐	NA	
10	**Land Acquisition**	Yes ☐ No ☐ NA ☐	NA	
10.1	Detailed schedule about acquisition of landholdings as per land records	Yes ☐ No ☐ NA ☐	NA	
10.2	Consultation with affected persons	Yes ☐ No ☐ NA ☐	NA	
10.3	Name/ Details of consultation with NGOs	Yes ☐ No ☐ NA ☐		
10.4	Name/ Details of consultation with concerned government agencies	Yes ☐ No ☐ NA ☐		
10.5	Total land required, land area already available , land to be acquired identified	Yes ☐ No ☐ NA ☐		
10.6	Review of land acquisition using digital cadastral map by client	Yes ☐ No ☐ NA ☐	NA	
11	**Strip plan- additional details added**	Yes ☐ No ☐ NA ☐	NA	11
11.1	Details of centreline, existing structures, road furniture and other features	Yes ☐ No ☐ NA ☐	NA	11.1
11.2	Widening scheme	Yes ☐ No ☐ NA ☐	NA	11.2
11.3	New construction/ reconstruction of structures and amenities	Yes ☐ No ☐ NA ☐	NA	11.3
11.4	Existing and proposed right of way	Yes ☐ No ☐ NA ☐	NA	11.4
11.5	Clearances impacting each chainage	Yes ☐ No ☐ NA ☐	NA	11.5
12	**Conclusions and recommendations**	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
12.1	Conclusions and recommendations	Yes ☐ No ☐ NA ☐	NA	
12.2	Report fulfils project objectives and scope as per RFP	Yes ☐ No ☐ NA ☐	NA	
12.3	Report reviewed for errors and omissions	Yes ☐ No ☐ NA ☐	NA	
12.4	Compliance report prepared on client observations	Yes ☐ No ☐ NA ☐	NA	

DPR Checklist – Stage 4 – Detailed Project Report (Structures)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
1	**Project background**	Yes ☐ No ☐ NA ☐	NA	
1.1	Project description • Existing LC number • Start and End Chainage • Village/District	Yes ☐ No ☐ NA ☐		
1.2	Project location map • On State Map • On District Map • Latitude & Longitude Coordinates of the LC	Yes ☐ No ☐ NA ☐		
1.3	Details of Existing Level Crossing • Number of Railway Tracks • Type of Railway Tracks (Broad/Metre/Narrow) • No. of trains per day	Yes ☐ No ☐ NA ☐		
1.4	Justification for need of an ROB/RUB (on basis of TVU count)	Yes ☐ No ☐ NA ☐	NA	
1.5	Overview of land use plans	Yes ☐ No ☐ NA ☐	NA	
1.6	Overview of existing pavement conditions • Number of Lanes • Type of Pavement (Flexible/Rigid/Surfaced/Unsurfaced)	Yes ☐ No ☐ NA ☐		
1.7	Existing right of way details	Yes ☐ No ☐ NA ☐		
1.8	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
2	**Social analysis of the project**	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
2.1	Project impact on stakeholders such as local people	Yes ☐ No ☐ NA ☐	NA	
2.2	Project impact on residential, commercial and public properties	Yes ☐ No ☐ NA ☐	NA	
2.3	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
3	**Reconnaissance survey**	Yes ☐ No ☐ NA ☐	NA	
3.1	Geometric Features of the Existing Road • Design Speed • Sight distance details • Horizontal Alignment Details • Vertical Alignment Details • Height of Embankment	Yes ☐ No ☐ NA ☐		
3.2	Topographical Survey using LiDAR or equivalent technology as per IRC:SP:19 • Gradient • Terrain	Yes ☐ No ☐ NA ☐	NA	
3.3	Pavement composition and condition survey as per IRC:SP:19	Yes ☐ No ☐ NA ☐	NA	
3.4	Geological Survey • Geological Map of the Area • Seismicity	Yes ☐ No ☐ NA ☐	NA	
3.5	Climatic Conditions • Temperature • Rainfall • Wind	Yes ☐ No ☐ NA ☐	NA	
3.6	Land Use along the existing alignment • Map of the Project Area depicting Agricultural/Habitation/Forest Area	Yes ☐ No ☐ NA ☐	NA	
3.7	Details of Existing Structures • Map of the Project Area depicting Hutments/Buildings/Temples/Public Building/Any Other Significant Structure	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
3.8	Inventory and condition survey of culverts	Yes ☐ No ☐ NA ☐	NA	
3.9	Geo-technical and sub-soil explorations as per IRC:78	Yes ☐ No ☐ NA ☐	NA	
3.10	Number of Bore holes dug (holds for every pier and abutment)	Yes ☐ No ☐ NA ☐		
3.11	Field testing, soil sampling, laboratory testing as per IRC: 78	Yes ☐ No ☐ NA ☐	NA	
3.12	Recommendation of Foundation Type and Depth	Yes ☐ No ☐ NA ☐		
3.13	Hydraulic and Hydrological investigations as per IRC:5	Yes ☐ No ☐ NA ☐	NA	
3.14	High Flood Level specified	Yes ☐ No ☐ NA ☐	NA	
3.15	Depth of Water Table specified	Yes ☐ No ☐ NA ☐	NA	
3.16	Ponded Water Level specified	Yes ☐ No ☐ NA ☐	NA	
3.17	Materials Survey conducted as per IRC:SP:19	Yes ☐ No ☐ NA ☐	NA	
3.18	Sources of Naturally Occurring Aggregates specified • Details of Borrow Pits with Distance from Project Site • Cost of Material/Transportation	Yes ☐ No ☐ NA ☐		
3.19	Sources of Manufactured Items specified • Details of Suppliers with Distance from Project Site • Cost of Material/Transportation	Yes ☐ No ☐ NA ☐	NA	
3.19.1	Sources of environmentally friendly construction materials identified as per MoRT&H circular	Yes ☐ No ☐ NA ☐	NA	
3.20	Source of Water for construction specified as per IS:456	Yes ☐ No ☐ NA ☐	NA	
3.21	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
4	**Traffic surveys and analysis**	Yes ☐ No ☐ NA ☐	NA	
4.1	Classified traffic volume counts using IHMCL data (7 day)	Yes ☐ No ☐ NA ☐	NA	
4.2	Traffic projection as per IRC:108	Yes ☐ No ☐ NA ☐	NA	
4.3	Projected Traffic data for 20 years	Yes ☐ No ☐ NA ☐	NA	
4.4	Current and Projected PCU	Yes ☐ No ☐ NA ☐		
4.5	Current and Projected TVU	Yes ☐ No ☐ NA ☐		
4.6	Axle load survey as per IRC:SP:19	Yes ☐ No ☐ NA ☐	NA	
4.7	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
5	**Determination of whether ROB or RUB is appropriate**	Yes ☐ No ☐ NA ☐	NA	
5.1	Justification of whether ROB or RUB should be built	Yes ☐ No ☐ NA ☐	NA	
6	**Alignment Options Study**	Yes ☐ No ☐ NA ☐	NA	
6.1	At least two alignments proposed • Details of Alignments on Map	Yes ☐ No ☐ NA ☐	NA	
6.2	Length of the project along proposed alignment options	Yes ☐ No ☐ NA ☐	NA	
6.3	Land Acquisition required along alignment options	Yes ☐ No ☐ NA ☐	NA	
6.4	Cost Estimates of alternatives	Yes ☐ No ☐ NA ☐	NA	
6.5	Recommended Alignment with Justification	Yes ☐ No ☐ NA ☐		
6.6	Skew Angle of Proposed Alignment Specified	Yes ☐ No ☐ NA ☐		
6.7	Traffic Diversion Route Specified	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
6.8	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
7	**Design Specifications**	Yes ☐ No ☐ NA ☐	NA	
7.1	Number of Lanes	Yes ☐ No ☐ NA ☐		
7.2	Width of ROB • Width of Carriageway • Width of Safety Kerbs • Width of Footpath • Any other	Yes ☐ No ☐ NA ☐		
7.3	Proposed Number of Lanes on ROB in line with PCU as per latest MoRTH guidelines	Yes ☐ No ☐ NA ☐	NA	
7.4	Proposed Length of the Project • Length of ROB • Length of Viaduct • Length of RE Wall • Length of Approach Road • Length of Service Road	Yes ☐ No ☐ NA ☐		
7.5	Span Arrangement • Span Length • Number of Spans	Yes ☐ No ☐ NA ☐		
7.6	Are all spans of standardised length as per Railways standards (https://ircep.gov.in/RCApproval/) • If non-standardised, suitable justification provided	Yes ☐ No ☐ NA ☐	NA	
7.7	Details of Proposed Superstructure Design • Type • Details of Material Use Proposed • Drawings of Cross-Sections	Yes ☐ No ☐ NA ☐	NA	
7.8	Details of Proposed Substructure Design Type • Details of Material Use Proposed • Drawings of Cross-Sections	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
7.9	Details of Proposed Pavement Design Type • Details of Material Use Proposed • Thickness • Design MSA • Drawings of Cross-Sections	Yes ☐ No ☐ NA ☐	NA	
7.10	Details of Drainage Structures Proposed	Yes ☐ No ☐ NA ☐	NA	
7.11	Any other details relevant to the project	Yes ☐ No ☐ NA ☐	NA	
8	**Cost estimates**	Yes ☐ No ☐ NA ☐	NA	
8.1	Summary of Cost Estimates (Refer following subsection)	Yes ☐ No ☐ NA ☐		
8.2	Detailed Abstract of Cost	Yes ☐ No ☐ NA ☐	NA	
8.3	Detailed Bills of Quantity	Yes ☐ No ☐ NA ☐	NA	
8.4	Detailed Rate Analysis	Yes ☐ No ☐ NA ☐	NA	
9	**Financial Viability**	Yes ☐ No ☐ NA ☐	NA	
9.1	Estimated cost details	Yes ☐ No ☐ NA ☐	NA	
9.2	Projected revenues details	Yes ☐ No ☐ NA ☐	NA	
9.3	Assumptions stated	Yes ☐ No ☐ NA ☐	NA	
9.4	Analysis and results • IRR • Sensitivity Analysis • Financial Viability	Yes ☐ No ☐ NA ☐		
10	**Land Acquisition Study**	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
10.1	Land Acquisition Details • Total Land Required • Land Area already available • Area of Land to be Acquired	Yes ☐ No ☐ NA ☐		
10.3	Details of LA Cost	Yes ☐ No ☐ NA ☐		
11	**Utility Shifting Study**	Yes ☐ No ☐ NA ☐	NA	
11.1	Results of GPR investigation	Yes ☐ No ☐ NA ☐	NA	
11.2	Utility relocation plan with existing / proposed location showing existing RoW and topographic details	Yes ☐ No ☐ NA ☐	NA	
11.3	Cost for relocation as per authority	Yes ☐ No ☐ NA ☐		
12	**General Arrangement Drawing**	Yes ☐ No ☐ NA ☐	NA	
12.1	Elevation of Railway Portion	Yes ☐ No ☐ NA ☐	NA	
12.2	Plan of Railway Portion	Yes ☐ No ☐ NA ☐	NA	
12.3	General Elevation	Yes ☐ No ☐ NA ☐	NA	
12.4	General Plan (showing complete ROB/RUB along with diversion)	Yes ☐ No ☐ NA ☐	NA	
12.5	Key Plan	Yes ☐ No ☐ NA ☐	NA	
12.6	Cross-Section of Railway Portion	Yes ☐ No ☐ NA ☐	NA	
12.7	3D engineered models of: • Existing structure, if any • Proposed structure • Utilities and other features in RoW	Yes ☐ No ☐ NA ☐		

Cost Summary Table

S.No.	Particulars	Cost Estimate(in '000)
1	*Cost of ROB Portion*	
	Foundation	
	Substructure	
	Superstructure	
	Total-ROB Portion	
2	*Cost of Viaduct*	
	Foundation	
	Substructure	
	Superstructure	
	Total-Viaduct	
3	*Cost of Approach Road*	
4	*Cost of RE Wall*	
5	*Cost of Service Road*	
6	*Miscellaneous Costs*	
	Cost of Subway	
	Cost of Toll Plaza	
	Cost of Culverts	
	Any Other Costs	
	Civil Cost of the Project	
7	*Contingencies @x%*	
	Total Civil Cost	
8	*Supervision Charges @x%*	
9	*Cost of Quality Control @x%*	
10	*Maintenance Charges @x%*	
11	*Escalation Costs @x%*	
12	*Land Acquisition Costs*	
13	*Utility Shifting Costs*	
14	*Any Other Costs*	

S.No.	Particulars	Cost Estimate(in '000)
	Total Cost of the Project	

DPR Checklist – Stage 5 – Technical Schedules (Structures)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
1	Bid documents- EPC	Yes ☐ No ☐ NA ☐	NA	
2	**Bid documents- Other, if any**	Yes ☐ No ☐ NA ☐	NA	
3	**Draft concession agreement**	Yes ☐ No ☐ NA ☐	NA	
3	**Schedule C - Project facilities**	Yes ☐ No ☐ NA ☐	NA	
4	**Schedule D - Specifications and standards**	Yes ☐ No ☐ NA ☐	NA	
5	**Any other relevant details**	Yes ☐ No ☐ NA ☐	NA	

DPR Checklist – Stage 6 – LA and Clearances II Report (Structures)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
1	**Executive Summary**	Yes ☐ No ☐ NA ☐	NA	
2	**Environment Clearance**	Yes ☐ No ☐ NA ☐	NA	
2.1	Details of public hearings completed	Yes ☐ No ☐ NA ☐		
2.2	Date of final environment clearance by competent authority	Yes ☐ No ☐ NA ☐		
3	**Forest Clearance**	Yes ☐ No ☐ NA ☐	NA	
3.1	Date/ Details of Joint site inspection with DFO/ competent authority	Yes ☐ No ☐ NA ☐		
3.2	Date of Stage I forest clearance approval by competent authority	Yes ☐ No ☐ NA ☐		
3.3	Date of final forest clearance approval by competent authority	Yes ☐ No ☐ NA ☐		
4	**Wildlife Clearance**	Yes ☐ No ☐ NA ☐	NA	
4.1	Date/ Details of joint site inspection with DFO/ competent authority	Yes ☐ No ☐ NA ☐		
4.2	Date of final wildlife clearance approval by competent authority	Yes ☐ No ☐ NA ☐		
5	**Utility Clearances (Electricity)**	Yes ☐ No ☐ NA ☐	NA	
5.1	Date/ Details of Joint site inspection with competent authority	Yes ☐ No ☐ NA ☐		
5.2	Date of estimate submission by competent authority	Yes ☐ No ☐ NA ☐		

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
5.3	Date of estimate approval by competent authority	Yes ☐ No ☐ NA ☐		
5.4	Approved utility shifting proposal	Yes ☐ No ☐ NA ☐		
5.5	Details of approved contractors, SoR and deposit details for user agency	Yes ☐ No ☐ NA ☐	NA	
5.6	Utilities checklist, no upgradation certificate attached	Yes ☐ No ☐ NA ☐		
6.2	Date of estimate submission by competent authority	Yes ☐ No ☐ NA ☐		
6.3	Date of estimate approval by competent authority	Yes ☐ No ☐ NA ☐		
6.4	Approved utility shifting proposal	Yes ☐ No ☐ NA ☐		
6.5	Details of approved contractors, SoR and deposit details for user agency	Yes ☐ No ☐ NA ☐	NA	
6.6	Utilities checklist, no upgradation certificate attached	Yes ☐ No ☐ NA ☐		
7.2	Date of estimate submission by competent authority	Yes ☐ No ☐ NA ☐		
7.3	Date of estimate approval by competent authority	Yes ☐ No ☐ NA ☐		
7.4	Approved utility shifting proposal	Yes ☐ No ☐ NA ☐		
7.5	Details of approved contractors, SoR and deposit details for user agency	Yes ☐ No ☐ NA ☐	NA	
7.6	Utilities checklist, no upgradation certificate attached	Yes ☐ No ☐ NA ☐		
8.2	Date of final approval of GAD by competent authority	Yes ☐ No ☐ NA ☐		
9	**Other Clearances**	Yes ☐ No ☐ NA ☐	NA	
9.1	Date of final approval by competent authority	Yes ☐ No ☐ NA ☐		
10	**Land Acquisition**	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
10.1	Draft 3a notification submitted	Yes ☐ No ☐ NA ☐	NA	
10.2	Review of 3a notification by client	Yes ☐ No ☐ NA ☐	NA	
10.3	Date of 3a gazette notification	Yes ☐ No ☐ NA ☐		
10.4	Draft 3a notification submitted	Yes ☐ No ☐ NA ☐	NA	
10.5	Review of 3A notification by client	Yes ☐ No ☐ NA ☐	NA	
10.6	Date of 3A gazette notification	Yes ☐ No ☐ NA ☐		
10.7	Date of Joint Measurement Survey with competent authority	Yes ☐ No ☐ NA ☐		
10.7.1	Date of survey	Yes ☐ No ☐ NA ☐	NA	
10.7.2	Land type –by survey number	Yes ☐ No ☐ NA ☐	NA	
10.7.3	Nature of Land –by survey number	Yes ☐ No ☐ NA ☐	NA	
10.7.4	Ownership status of plots- by survey number	Yes ☐ No ☐ NA ☐	NA	
10.7.5	Verification of area to be acquired – by survey number	Yes ☐ No ☐ NA ☐	NA	
10.7.6	List of structures on each plot	Yes ☐ No ☐ NA ☐	NA	
10.7.7	Sketches of updated alignment	Yes ☐ No ☐ NA ☐	NA	
10.7.8	Verification from Land revenue department	Yes ☐ No ☐ NA ☐	NA	
10.7.9	Verification by CALA office	Yes ☐ No ☐ NA ☐	NA	

DPR Checklist – Stage 7 – Award determination (Structures)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
1	**Executive Summary**	Yes ☐ No ☐ NA ☐	NA	
2	**Village level summary**	Yes ☐ No ☐ NA ☐	NA	
2.1	Total private and public land being acquired	Yes ☐ No ☐ NA ☐	NA	
2.2	Variation in area and nature of land against 3D with justification	Yes ☐ No ☐ NA ☐	NA	
2.3	Method used by CALA to arrive at award	Yes ☐ No ☐ NA ☐	NA	
2.4	Date of award by CALA and approval by <Agency>along with valuation report			
2.5	Total award calculated and details of deviation from RFCTLARR act	Yes ☐ No ☐ NA ☐	NA	
3	**In detail**	Yes ☐ No ☐ NA ☐	NA	
3.1	Updated land acquisition tracker with parcel-wise status of: • Notifications • Award • Disbursement	Yes ☐ No ☐ NA ☐	NA	
3.2	Valuation report and details of award calculation- verification by state authority to be included	Yes ☐ No ☐ NA ☐	NA	
3.3	Claims report	Yes ☐ No ☐ NA ☐	NA	
3.4	Copies of notifications published	Yes ☐ No ☐ NA ☐	NA	
3.5	Copies of land possession certificates received	Yes ☐ No ☐ NA ☐	NA	
4	**Conclusions and recommendations**	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
4.1	Conclusions and recommendations	Yes ☐ No ☐ NA ☐	NA	
4.2	Report fulfils project objectives and scope as per RFP	Yes ☐ No ☐ NA ☐	NA	
4.3	Report reviewed for errors and omissions	Yes ☐ No ☐ NA ☐	NA	
4.4	Compliance report prepared on client observations	Yes ☐ No ☐ NA ☐	NA	

DPR Checklist – Stage 8 – Land possession report (Structures)

General Details	
Project Name	
Consultant's Name	
Date of Review	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
1	**Executive Summary**	Yes ☐ No ☐ NA ☐	NA	
2	**Village level summary**	Yes ☐ No ☐ NA ☐	NA	
2.1	Total private and public land being acquired	Yes ☐ No ☐ NA ☐	NA	
2.2	Date of final award by CALA and approval by <AGENCY>			
2.3	Status of disbursement on date of receipt of Land possession certificate	Yes ☐ No ☐ NA ☐	NA	
2.4	Key issues being faced in completing land acquisition, if any	Yes ☐ No ☐ NA ☐	NA	
3	**In detail**	Yes ☐ No ☐ NA ☐	NA	
3.1	Updated land acquisition tracker with status of: • Notifications • Award • Disbursement	Yes ☐ No ☐ NA ☐	NA	
3.2	Final award and claims report	Yes ☐ No ☐ NA ☐	NA	
3.3	Copies of notifications published, land possession certificates received	Yes ☐ No ☐ NA ☐	NA	
4	**Conclusions and recommendations**	Yes ☐ No ☐ NA ☐	NA	
4.1	Conclusions and recommendations	Yes ☐ No ☐ NA ☐	NA	

S.No	SECTION OF THE REPORT	YES/NO/NA	Details/ Specifications	Remarks
4.2	Report fulfils project objectives and scope as per RFP	Yes ☐ No ☐ NA ☐	NA	
4.3	Report reviewed for errors and omissions	Yes ☐ No ☐ NA ☐	NA	
4.4	Compliance report prepared on client observations	Yes ☐ No ☐ NA ☐	NA	
5	**GIS Map containing digitised details of land parcels acquired with all relevant details**	**Yes ☐ No ☐ NA ☐**	**NA**	

APPENDIX-IX

Sample Executive Summary of Detailed Project Report

<Name & Logo of the Agency>

(Ministry of Road Transport & Highways)

Government of India

Executive summary of detailed project report for:

[Project name, stretch, state]

All figures, details and graphs in this template are illustrative. Consultants are to add actual details and expand tables, chapters as needed while keeping the format and information required in each chapter as suggested. Please delete this sticker upon completion

DPR Consultant

[Name and logo of consulting agency]

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1. Introduction

The <Agency>proposes to implement the <re> the development, maintenance and management of the <NH-xx> stretch from <Origin> to <Destination> from chainage <aa km> to <bb km> into <proposed improvement, xx lane road/ expressway etc.> under the NHDP Phase V programme. The proposed project road has been selected to <primary reason for project- e.g. to improve connectivity and ease congestion between aa bb>

<Consultant> was appointed in <mm/yyyy> to prepare the detailed project report for the project road, and this executive summary covers is submitted along with the <draft/final> detailed project report to cover the key aspects of the project.

<Any special circumstances or requests made by the Authority for the project that affect the consultancy assignment e.g.: <Agency>desired to restructure project into two packages, bifurcating the project road at Betulnagar, this report has been revised and resubmitted providing improvement proposals and bid documents separately for the two stretches>

2. Project overview

As described earlier the project road lies on NH xx (previously NH yy) and connects <orgin> with <destination>, passing through the states of <state 1, state 2>. The proposed project alignment passess through <towns/junctions a, b, c, d> for a total length of <xx km>.

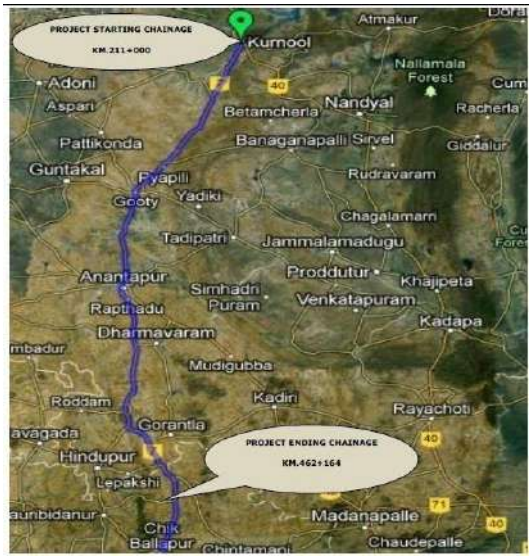

Figure 1: Location of project road

2.1. Key features of project

Table 1: Key features of project

Attributes	Details
NH No	Xx (old) Yy (new)
Origin- Destination	Origin-destination Origin point Lat/long – destination point lat/long
Via towns	Town 1, 2, 3, 4
Existing carriageway	2L (7.0m) over 80% of the road stretch with 4L (16.0m) in 20% of the stretch in some urban locations
Service lanes and slip roads	Service lanes of 2-4m width for 16 km, largely in urban areas
Shoulder	2L has paved shoulder of 1-2m width
Condition of existing pavement	Good to fair
Right of way	Typically 45 m along entire stretch
Land use along project road	Predominant land use in the area is agricultural (60% on LHS, 50% on RHS), with the rest being urban and forest area (20% on LHS, RHS)
Traffic on the stretch	Largely commercial, with trucks accounting for 80% of vehicle volume
Toll infrastructure	There are no toll plazas in the current stretch

Attributes	Details
Terrain	Primarily plain and rolling, passing through x settlements
Structures along stretch	69 structures- 3 ROBs, 7 major bridges, 2 flyovers, 9 minor bridges, 16 VUP/PUPs and 32 culverts
User amenities along stretch	32 bus shelters, 7 truck lay-byes, and 1 rest area
Key utilities in the proposed RoW	4 km 66 kV UG line with 3 crossings, 30in water main for 7.3 km
Forest Stretches along RoW	Xx km of road from <point a> to <point b> crosses <type of forest><forest name>
Rail crossings along RoW	Railway LC no <x> at chainage yy on the <origin station> to <destination station> rail line at railway chainage zz
Other clearance related aspects	<please describe any other clearances that will be required for the project>

2.2. Key plan of existing project stretch

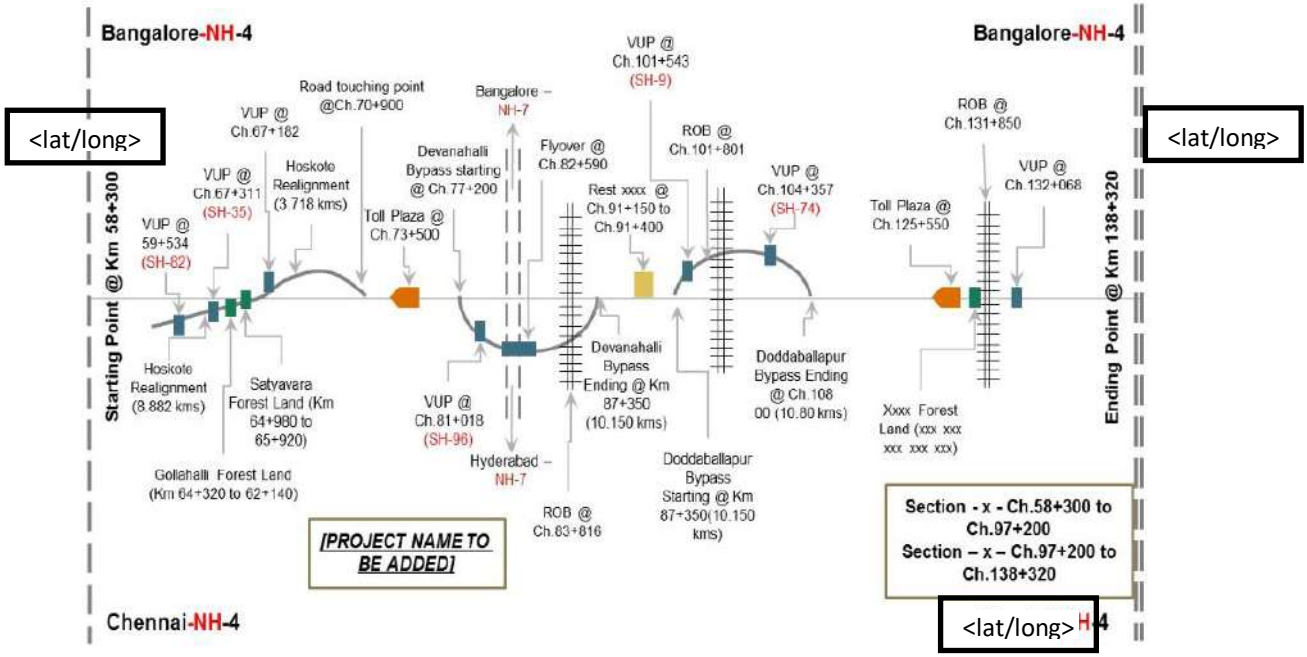

Figure 2: Key plan of existing project road

3. Traffic demands on project road

3.1. Traffic volume surveys

For the purposes of traffic projections and lane design, <xx> individual sections of road were considered:

Table 2: Traffic survey locations

Section	Chainages	Length (Kms)		Volume Count Locations	Remarks
1	Km 163.0 - 192.0	29.0		Km 177.0, 45.0	Kasia/Tonta mines near 192.000
2	Km 192.0 - 219.0	27.0		Km 201.50	End point of proposed Koida bypass at km 218.250

Traffic volume surveys for the project road were < available from IHMCL for x locations> and were carried out at <x> additional locations along the project road in the month of <mm/yyyy>. The results are as follows:

Table 3: Results of traffic surveys conducted

Homogenous section	1	1	2	
Chainage	45.00	177.00	201.50	
Source of data	IHMCL	Consultant	Consultant	
Bicycle	47	75	61	
2 Wheeler	3320	3288	2630	
3 Wheeler	32	47	30	
Tractor	24	18	22	
Tractor with Trailer	389	385	341	
2 Axle SCV	436	386	388	
LMV 2 axle	3561	3545	3327	
LCV 2 Axle	577	603	563	
2 Axle Truck or Bus	908	987	1014	
3 Axle Truck or Bus	1142	1062	1086	
Multi Axle Vehicles MAV	2033	1962	1994	
Oversized Vehicle OSV	2	1	3	

Cycle	0	0	0	
Earth Moving Equipment	0	0	0	
AADT (in vehicles)	12471	12359	11459	
AADT (in PCUs)	34000	xx	xx	

3.2. Axle load survey

Axle load surveys were conducted at <x> locations using <xxxx> to understand the actual load spectrum of commercial vehicles plying on the prject road. The results of the load survey, were converted to Vehicle Damage Factor (VDF) using equivalency factors from <IRC xx> for the purpose of MSA calculations

Table 4: Axle load survey results

Mode	Section 1		Section 2		Section 2	
	Observed - at chainage xx	Recommended	Observed - at chainage xx	Recommended	Observed - at chainage xx	Recommended
LCV	0.47	0.47	0.45	0.45		
2-axle	3.97	3.97	3.57	3.97		
3-axle	3.63	3.63	3.26	3.26		
MAV	4.92	4.92	4.07	4.07		
Bus	0.78	0.82	0.82	0.82		

3.3. Traffic volume forecast

Traffic volume forecast was developed using the <xx> method and converted to Million Standard Axles (MSA) for the purposes of pavement design. The cumulative load in MSA for each section is given as under for various horizon years:

Table 5: Projected traffic load on project road in MSA

MSA	**In x+15**		**In x+30**	
Section	**LHS**	**RHS**	**LHS**	**RHS**
1	23.31	22		
2	33	40		

3.4. Turning movement surveys

SL. No.	Existing Chainage	Location	Total Volume PCU	Peak Hour Volume PCU	Peak Hour	Intersection type	Grade separator proposed
1	0.300	xxx	30988	1915	17:00 - 18:00	3 arm	No
2	6.200	xxx	28077	1962	09:00 - 10:00	4 arm	No
3	10.200	xxx	53333	3599	15:00 - 16:00	5 arm	Yes
4	28.000	xxx	64315	3884	10:00 - 11:00	4 arm	Yes

Classified direction wise turning movement surveys were conducted at <x> intersections to determine the need for re-design and addition of structure at the intersection

Table 6: Turning movement survey results

4. Pavement and corridor surveys

4.1. Pavement condition and distress seen

The overall pavement condition <description of overall pavement condition- e.g. from poor to very poor, with high roughness and significant presence of potholes and raveling>

Table 7: Condition survey of existing pavement

Type of distress	Length affected, in Kms				
	Area <=10 %	Area 10 %-25 %	Area 25 %-50 %	Area 50 %-75%	Area >75 %
Total Cracking	36	70	0	0	0
Potholes	28	23	55	0	0
Patching	44	61	1	0	0
Raveling	80	4	22	0	0
<other categories seen>					
Total	106	106	106	106	106

4.2. Pavement composition

The existing pavement structure is a <rigid/flexible/inverted etc.> pavement consisting of sub-grade and <x> additional layers. The summary of pavement composition seen is as follows

Table 8: Composition of existing pavement

Section	Bituminous course (mm)		Granular course (mm)		Xx (mm)	
	Min	Max	Min	Max	Min	Max
1	**50**	**350**	**100**	**600**		
2	**40**	**300**	**80**	**500**		
X						

4.3. Pavement strength

<xxx FWD/BBD> was carried out to test the strength of the existing pavement, and the characteristic deflection values have been calculated for each homogeneous section of road to enable design of an overlay for the road.

Table 9: Strength of existing pavement

Section	Chainage		Distance	Characteristic deflection
	Start	End	Km	Mm
1	0.400	2.400	2.000	1.6
2	2.400	10.000	7.600	1.3
X				

4.4. Sub-grade soil survey

Extensive review of available soil information and testing was done to understand the sub-grade characteristics. Summary of soil investigation surveys is as follows:

Table 10: Soil investigation survey results

Attribute	Results	Comments
Sub-grade CBR range (%)	0.6%-14%	Low over large lengths of section
Degree of compaction (% of MDD)	~95%	Sufficient as per MoRTH guidelines
Swelling ratio (%)	2.5 to 32%	Significant variation seen across stretch
<other attributes>		

Table 11: Soil types observed

Soil type	% of length	Plasticity index	Comments
Clayey sand (SC)	34%	3 to 15	Poorly graded sand clay mixture
Silty sand (SM)	9%	Non-plastic	Poorly graded
Clayey gravel (GC)	9%	11 to 13	Mixture of gravel, sand and silt

5. Improvement proposals

5.1. Proposed alignment

The final alignment chosen for the project in consultation with <xx, yy> will <be along current project road/ pass through xx, yy new towns- short description of alignment with changes if any>.

Figure 3: Map showing proposed alignment of project road

5.2. Bypasses proposed

Given increasing urban traffic and congestion and the lack of available RoW in urban areas through the project route, <x> urban areas are proosed to be by-passed in the proposed project alignment

Table 12: Proposed by-passes along project length

Urban area to be bypassed	Bypass plan			Key driver for by-pass
	Start chainage	End chainage	Length proposed	
Nagar 1	45.000	52.000	21.000	Heavy local traffic of ~10,000 PCUs in town limits
Xxxx				

5.3. Road geometry

The project road has been re-designed to accommodate speeds of <xx>, adopted as per <standard or consultation with <AGENCY>>. Enabling this higher speed will require re-design and re-alignemnt of the road in certain sections given their <description of poor geometry>.

5.4. Widening scheme

Basis traffic information available, level of service requirements and consultation with <<AGENCY>, local authorities etc.>, the following lane configuration is adopted for the project road:

Table 13: Lane configuration planned for project road

Section	Chainage		Traffic forecast k PCUs in 20xx	Lane config.	Service lanes	Comments
	Start	End				
1	0.00	2.400	43.5	6	Yes	High urban traffic influx
2	2.400	60.400	16.4	4	No	
3						
xx						

Basis availability of RoW and land acquisition constraints, a widening scheme has been proposed that makes optimum use of existing ROW and minimizes need for land acquisition in urban areas, a summary of which is given below:

Table 14: Summary of widening type proposed

Sl no	Type of widening	Length, Km
1	Concentric	2.400
2	Eccentric, Right	34.600
3	Eccentric, Left	33.800
4	Green field	16.000

5.5. Pavement design

5.5.1. Design period, loading and pavement type

Using the projected traffic, VDF values,lane and directional distribution factors, the design traffic loading used for the project is <xx to yy> MSA.

Through preliminary design and lifecycle comparisons, the <flexible/rigid/inverted> type of pavement was chosen for construction with a design life of <xx> years as per <IRC/MoRTH/<AGENCY> standards/request> has been considered for design.

5.5.2. Design sub-grade strength

Considering the soil investigations conducted in the prject road area, and the availability of suitable soil in the region, the following sub-grade strength has been assumed to vary from <xx%> to <yy%> for various sections of the highway

5.5.3. Pavement composition for new carriageway

The proposed pavement composition for the new sections carriageway basis <standards>, subgrade strength and design traffic is:

Table 15: Proposed pavement composition

Section	Design Chainage		Sub-grade strength	Pavement loading	Layer thickness (mm)				
	Start	End	Min % CBR	MSA	GSB	WMM	DBM	BC	xx
1	0.400	2.400	10%	40	200	250	95-125	40	
2	2.400	10.000	8%						
X									

5.5.4. Strengthening of existing pavement

The strengthening requirements for the existing pavement have been estimated from the deflection measurements and estimated traffic loadings. The designed overlay proposed is as below:

Table 16: Overlay thickness required

Section	Chainage		Distance	Characteristic deflection	Overlay thickness (mm)	
	Start	End	Km	Mm	DBM	Xx
1	0.400	2.400	2.000	1.6	95	40
2	2.400	10.000	7.600	1.3	50	40
X						

5.5.5. Pavement design for service lanes

Pavement for service lanes is designed for MSA of xx-yy with a design CBR of ~xx%. The composition for the <flexible/rigid> service lane pavement along the project corridor is as follows:

Table 17: Pavement composition for service road

Layer	Layer Thickness in mm
SDBC	25
DBM	50
WMM	250
GSB	150

5.6. Design of structures

Along the project stretch, there are several bridges, culverts, under/overpasses and flyovers. A summary of the total number and proposed additions is given in the table below

Table 18: Proposed improvement to structures along project road

Sl No	Structure	Existing	Dismantle	Widen	Reconstruct	Construct in parallel	New construction	Total
1	Major bridge	4	1	-	1	2	3	7
2	Minor bridge							
3	Flyover							
4	Vehicle overpass							
5	Vehicle underpass							
6	Passenger under pass							
7	Culverts							
8	xxx							

5.7. Intersections and grade separators

Based on the traffic and turning movement surveys conducted, <xx> junctions have been identified for redesign or grade separation, the details of which are given below

Table 19: Proposed intersection improvement

SL. No.	Existing Chainage	Location	Est total vol (k PCU)	Est Peak HourVol (k PCU)	Improvement proposed
1	10.200	xxx	53333	3599	Grade separator
2	28.000	xxx	64315	3884	Grade separator
3					
4					

5.8. Toll plazas

Based on the traffic surveys, O-D surveys and layout of project road, <xx> toll plazas are proposed along the project road:

Table 20: Location of current and proposed toll plazas

Sl No	Existing chainage	Design chainage	Location	Existing no of lanes	Proposed no of lanes
1	20.400	22.600	Near origin	2	6
2	95.000	101.500	Near via-nagar junction	New	6
x	xx	xx			

5.9. Wayside amenities proposed

<local discussions, discussions with authority, demand modelling etc.> was conducted to locate various way-side amenities across the project road. A summary of the improvements proposed is given below:

Table 21: Proposed user amenities along project stretch

Sl no	Amenity type	Current	Proposed	Comments
1	Passenger rest stops	0	2	
2	Truck lay-byes	5	15	High demand due to urban areas along stretch
3	Bus bays	4	10	Limited increase due to scarcity of land
4	Bus shelters	2	34	Proposed in lieu of bus-bays
5	Petrol bunks	1	5	Severe shortage along stretch

6. Environmental impact assessment

6.1. Impact and clearances needed

A environmental impact study was undertaken during the process of creating the detailed project report to understand impact of the project road on the surrounding ecology and environment. The project road is categorized as a category <xx> project by the MoEF and as it is <xx km> in length, it <will/will not> require environmental clearances.

The proposed project <involves/does not involve> the acquisition of forest/ecologically sensitive land, felling of trees and will impact wildlife habitat and will hence require individual clearances for each. A summary of the environmental impact and clearances required is provided below

Table 22: Environmental impact and clearances required

Sl No	Impact type	Description	Clearance status
1	Environmental clearance	Required due to nature of project, category 'A'	Form 1 submitted dd/mm/yyyy and environmental clearance obtained on dd/mmm/yyyy
2	Diversion of forest land	27.72 ha of land in <xx> district will need to be acquired	Stage II clearance in progress
3	Trees in RoW	28,460 trees need to be enable road expansion	To be taken

6.2. Cost of environmental mitigation

The Environmental Mitigation and Management Costs were developed based on the estimation of resources required to implement the mitigation measures proposed and also number of places where intervention is required. Environmental mitigation cost for the proposed project is Rs. <xx> cr.

7. Social impact assessment and Land acquisition

7.1. Social impact assessment

The existing RoW (x-y m) is <adequate/ in adequate> for the proposed widening and RoW requirements as required by <<AGENCY>/Authority>. This will lead to the additional acquisition of <xx> Ha across the states of <states1, 2>, affecting a total of <yy> villages in <zz> districts. In addition to structures found to be encroaching the current Row, the required acquisition is poised to affect <xx> residential and <yy> other structures.

Preliminary interactions have been held with locals to understand their issues and concerns and help communicate the project plan and its impact on them. The key concerns of title and non-title holders centered around:

- <Key issues expressed over and above land being acquired, and compensation norms>

7.2. Land acquisition requirements

The state and district wise details and status of land acquisition as on the date of publishing of this report is as follows:

Table 23: Districtwise land acquisition requirements and status

State	Village and Chainage	Total land required (Ha)	Private land to be acquired (Ha)	3A pending (Ha)	3A done, 3D pending (Ha)	3D completed
Maharashtra	Thane (xx to yy)	137	90	10	70	10
Gujarat	<aaa>	454	400	20	300	80
Gujarat	<bbb>	588	588	60	500	28
Gujarat	<ccc>	688	320	80	160	80

A total of <xx cr> is expected to be awarded for the acquisition of land required for this project. The land acquisition process is underway with a total of <xx> CALAs appointed, and 90% of land is expected to be in possession by <xx, 20xx>.

7.3. Key risks envisaged in land acquisition

Despite the best efforts of the consultant and various lad acquisition teams working to complete land acquisition, it is envisaged that acquiring possession of the RoW for some specific sections of the project road may prove to be difficult or be delayed inordinately. Such potential risks are highlighted below:

- <Highlight any risks foreseen along with chainage and ha affected>

8. Utilities shifting and clearances

Utilities belonging to <x> user agencies have been identified that fall within the project road ROW and will need to be shifted to enable road construction. Shifting proposals have been submitted to the user agencies and initial estimates have been received from the concerned agencies. The process of site inspection, review and revision of the proposals for utilities shifting is in process.

<To enable better management of utilities and installation going forward, all utilities are being shifted underground/into a utilitiy corridor/out of the road RoW/ utilities trench is being planned as part of construction>

8.1. Utilities shifting estimates

Table 24: Key utilities shifting requirements

Sl No	Utility	Chainage affected	Agency	Shifting required	Estimated cost (INR cr)	Supervision %	Current status
1	66kV powerline	123.00-145.00	UPVVNL	19km of overhead cable, 4 road crossings	~140 cr	15%	Final approval obtained

8.2. Total cost of utilities shifting

The total cost of utilities shifting for all the utilities identified in the road RoW is estimated to be <xx cr> with supervision charges of <yy cr> being paid as supervision charges to the <z> concerned agencies.

9. Project cost estimates

The cost estimates for the project has been carried out based on detailed design, bill of quantities, and the schedule of rates for <state/district/authority> of year <xx-yy>.

Table 25: Summary of project cost

No	Item	Amount in Cr	Amount in %
	Civil construction cost		
1	Site clearance and dismantling	60	2%
2	Earth Work		
3	Base courses		
4	Paving courses		
5a	Repair and rehabilitation of structures		
5b	Bridges		
5c	Culverts		
5d	PUP/VUP		
5e	Flyover and overpass		
5f	Drainage, protective works and other services		
5g	RE/toe walls		
6	Junctions and interchanges		
7	Toll plazas		
8	User amenities		
9	Traffic signs, road markings, other appurtenences		
10	Miscellaneous		
11	Maintenance of road during construction		
A	Total civil cost		
12	Add contingencies @ x% on Z		
B	Estimated project cost		
13	Construction supervision @ x% on Z		
14	Agency charges @ x% on Z		
15	Quality control changes @ x% on Z		
16	Road safety cell audit charges @ x% on Z		
17	Maintenance costs @ x% on Z		
18	Escalation @ x% on Z		
C	Total project cost		
19	R&R cost		
20	Environment cost		
21	Cost of shifting utilities		
22	LA compensation cost		
D	Total capital cost		

10. Material investigation

Material investigations were carried out to explore the availability and identify sources of suitable material for the construction of the road.

<retain only relevant sections>

10.1. Borrow pits for soil

Material investigation of <xxx> locations indicates that soil suitable for embankment (of CBR>xx% and density yy g/cc) and for sub-grade (CBR>xx% and density yy g/cc) is available at an average lead of aa to bb km for the project stretch.

<include details on additional material sources like construction rubble, moorum etc>

10.2. Sand

Sand is available in <close proximity> of the project site. Test results show that xx of yy sand sources satisfy the minimum requirement for use in the project.

<Include details of additional potential for sources such as pond bed desilting, other excavation happening>

10.3. Gravel

Several quarries were identified for sourcing aggregates in the project zone. Xx of yy quarries were found to be suitable for use in the construction of the road. <further details on gravel available and suitability for construction>

10.4. Fly ash

Fly ash is available in close proximity of the project road due to the presence of <xx steel plant/power plant>. Test results show that the available fly ash <satisfies/does not satisfy> the minimum requirement of <specification> to use as <material for embankment/cement mixture/other layers>. The fly ash available has density greater than xx g/cc and shows an OCM of xx-yy%. <the fly ash located isnon plastic>

10.5. Bitumen

Bulk bitumen of the <required grades> is available <closest sources> with an average lead of <xx km>. For the project road <grade> of bitumen has been proposed for <yy layer> due to <reason> and <grade of bitumen> has been proposed for <zz layer> due to <reason>.

10.6. Cement

Bulk bitumen of the <required grades> is available <closest sources> with an average lead of <xx km>. For the project road <grade> of bitumen has been proposed for <yy layer> due to <reason> and <grade of bitumen> has been proposed for <zz layer> due to <reason>.

Other local material available

Details of other local material available for construction

Table 26: Locally available and alternative materials

Sl No	Material	Source
1	Hume pipes	Local hume pipe factory in xx yy
2	xx	xxxx

10.7. Key risks

Despite the best efforts of the consultant, there continue to be some materials and sections of the project road where material will have to brought from significant leads.

Table 27: Key risks envisaged in material procurement

Sl No	Chainage	Material	Closest source
1	Entire project	Bitument	Closest available source is Mumbai at a lead of 900 km
2	223.00+	Soil of CBR >10%	No borrow pit in vicinity, minimum lead of 40 km

10.8. Location of material sources

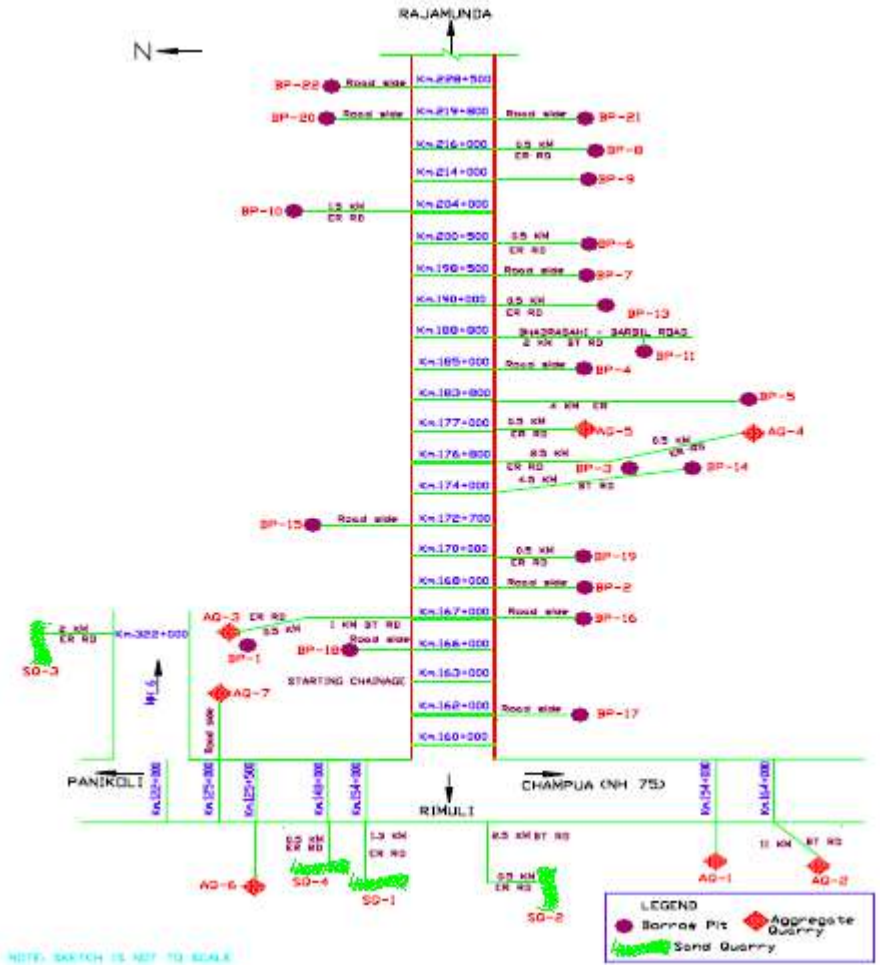

Figure 4: Key plan showing location of potential borrow pits tested

11. Potential for value engineering and innovative technologies

Throughout the detailed design of the project, several opportunities for value engineering and introduction of new technology were explored that will help in reducing the cost of the project or increase quality and longevity of project road. Approval of these elements as part of the construction design and suitable instructions to all stakeholders of the project can help significantly lower the projected cost of construction.

A summary of these opportunities is provided here.

Table 28: Key value engineering opportunities identified

Sl No	Value engineering opportunity	Potential impact
1	Use of inverted pavement with a cement stabilized based and granular material in the base layer	40% reduction in layer thickness and ~15% reduction in TPC

12. Economic and financial analysis

12.1. Economic analysis of the project

The EIRR and NPV of the project has been carried out using <model/software> under multiple scenarios, and the project returns <justify/do not justify> construction given an EIRR of xx in the best case and yy in the worst case.

The various sensitivity scenarios considered were as follows:

0. Base case: Base cost and base benefits
1. Sensitivity 1: Base cost plus xx% and base benefits
2. Sensitivity 2: Xx
3. Sensitivity 3: Xx

The results of the base case and sensitivity analysis are presented below:

Table 29: Economic return analysis

Option	Sensitivity Case	RUCS		HDM 4	
		NPV (in million Rs.)	EIRR (in %)	NPV (in million Rs.)	EIRR (in %)
With time	Base Case 0	19199	30.31	2788.5	14.1
	Sensitivity 1	18041	27.51	1362.6	12.9
	Sensitivity 2	15147	27.1	943.3	12.8
	Sensitivity 3	13989	24.56	-ve	11.7
Without time	Base Case 0	19199	30.31	2788.5	14.1
	Sensitivity 1	18041	27.51	1362.6	12.9
	Sensitivity 2	15147	27.1	943.3	12.8
	Sensitivity 3	13989	24.56	-ve	11.7

12.2. Financial analysis

12.2.1. Potential for toll revenue

The projected tollable traffic basis traffic survey and forecasts at the <xx> toll plazas suggested in year <xx> is given below

Table 30: Tollable traffic on project stretch

Toll Plaza	1 @ Chainage 45.000 1		2	
Traffic type	Total	Tollable		
Bicycle	47	0		

2 Wheeler	3320	0		
3 Wheeler	32	0		
Tractor	24	0		
Tractor with Trailer	389	385		
2 Axle SCV	436	386		
LMV 2 axle	3561	3545		
LCV 2 Axle	577	603		
2 Axle Truck or Bus	908	800		
3 Axle Truck or Bus	1142	1062		
Multi Axle Vehicles MAV	2033	1962		
Oversized Vehicle OSV	2	1		
Earth Moving Equipment	0	0		
AADT (in vehicles)	12471	6500		

12.2.2. Results of financial analysis

With the most likely traffic scenario and assumed costs of construction, maintenance, financing and tolling over the period of the project, the return on equity at various periods of concession was calculated. Equity IRR for this project will pass <15%> in year <x> of this project, hence it <is/is not> possible to bid the project

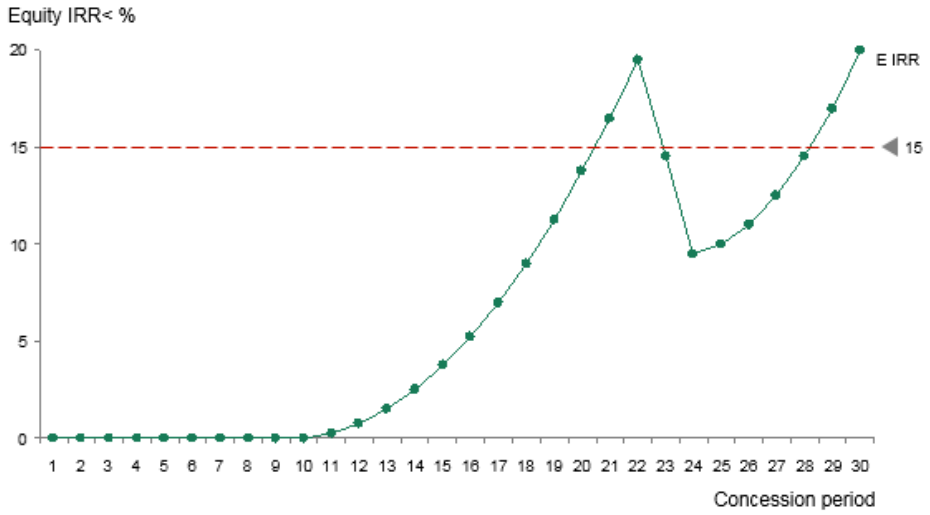

Figure 5: Equity IRR with increasing concession period for project road

13. Execution plan

In consultation with <AGENCY>, it is proposed to complete the proosed project road in a period of <xx> months. Planning for the project packaging, bidding process and construction was conducted as a part of this project.

13.1. Packaging

Given the length of the project, the entire project is planned to be bid out in <xx> packages with <yy> packages.

<include table of package details if more than 1 package>

13.2. Bidding mode and timelines

The authority has proposed to initiate bidding of the project under <bot/epc/ham> mode <with a grant/premium of xx %>. The tentative timeline for this is:

- Submission of bid documents to authority dd/mmm/yyyy
- Review and finalization of documents dd/mmm/yyyy
- Launch of tender dd/mmm/yyyy
- Tender close date dd/mmm/yyyy
- Tentative date for award of project dd/mmm/yyyy

13.3. Construction time and planning

Upon reviewing the improvements planned and in consultation with <AGENCY>, the design and construction period for this project has been arrived at <xx> months from the date of appointment of the contractor/concessionaire. To enable this construction schedule, a detailed construction plan and timeline has been included in the detailed project report. This also includes a traffic management and lane closure plan for the period of construction.

14. Conclusions and recommendation

The <expansion/rehabilitation> of the project road from <source> to <destination>, chainage <a> to <b> on NH <x> in the states of <state 1, state 2> to <n> lane configuration is recommended for implementation by <AGENCY> as the project is likely to <1 line justification/ need of project: provide much needed connectivity/improve connectivity/provide higher level of service/rehabilitate the road etc, is needed urgently>.

The project as envisaged is economically viable with an estimated EIRR >12%. The project with a 30 year concession period is expected to return an equity IRR of <xx%> with <yy%><grant/premium> and is hence recommended for implementation in the <BOT/EPC/HAM> mode.

Table 31: Salient features and key financial aspects of the project road a

Project road		
Project road length		Xx km
Connecting		<origin>- <destination>
On national highway		NH No
Proposed features	Current road	Proposed
Lanes	2	4
Bypasses proposed	-	5
Major junctions	5	5
Minor Junctions	18	18
Grade separated interchanges	1	4
Major Bridges	4	6
Minor Bridges	19	21
ROBs	1	3
Culverts	120	200
Vehicle/Pedestrian under/overpasses	16	25
Service roads (kms)	14	32
Slip roads (kms)	8	9
Toll plazas (no)	-	2
Bus bays (no)	4	15
Truck lay-byes (no)	2	8
Rest areas (no)	2	6
Financial implications		INR Cr/%
Total capital cost		1595
Total project cost		1486
Civil construction cost (incl. contingency)		1249

Preconstruction expenses	110
Land acquisition	40
Utilities shifting	30
Rehabilitiation and resettlement costs	20
Other pre-construction expenses	20
Implementation mode proposed	BOT (Toll)
Total project cost	1486
Concession period	18 years
<Authority> support (Grant/Premium)	18%
Estimated NPV	50
Project IRR	12%
Equity IRR	15%