



**Ministry of Road Transport & Highways
Government of India**

Consultancy Services for Two Lane with Paved shoulder of

- (1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727
- (2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa Ashram - Prakhand Gawnaha - Indo / Nepal Border
- (3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on NH-727
- (4) Areraj - Motihari in Bihar on EPC Mode. **DPR/BIHAR/NHD-MOD-PAT/02**

***REQUEST FOR PROPOSAL
(RFP)***

December 2016

MORT&H through Chief Engineer (N.H Wing), Road Construction Department,
Govt. Of Bihar, Patna.

INDEX

Sl. No.	Content	PageNo.
1	Notice Inviting Tender (NIT) As per Original NIT	3
2	Letter of Invitation	4-18
3	Annex -I:Listof Projects along with Package Nos.	19
4	Annex-II: Procedure of Assessment of Least Cost to MORT&H under special circumstances	20-25
5	Data Sheet	26-36
6	Appendix-I: Terms of Reference	37-85
7	Supplement-I: Additional Requirements for Hill Roads	86-90
8	Supplement-II: Additional Requirements for Bridges	91-93
9	Supplement–III: Additional requirement for safety audit	94-98
10	Enclosure-I: Manning Schedule	99
11	Enclosure-II: Qualification Requirements of Key Personnel	100-107
12	Enclosure-III: Schedule for Submission of Reports and Documents	108-109
13	Appendix–II: Formats for Eligibility	110-115
14	Appendix-III: Formats for Technical Proposals	116-129
15	Appendix-IV: Formats for Financial Proposals	130-139
16	Appendix-V: Detailed Evaluation Criteria	140-158
17	Appendix-VI: Draft Contract Agreement	159-203

**Ministry of Road Transport & Highways
Government of India**

NOTICE INVITING TENDER(NIT)

1. **MORT&H through Chief Engineer (N.H Wing), Road Construction Department,
Govt. Of Bihar, Patna.**

has been assigned the work of **preparation of Feasibility Study and Detailed Project Report for Improvement to Two Lane with Paved shoulder of**

- (1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727
- (2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa Ashram - Prakhand Gawnaha - Indo / Nepal Border
- (3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on NH-727
- (4) Areraj - Motihari in Bihar on EPC Mode.**DPR/BIHAR/NHD-MOD-PAT/02**

(as per **Annexure I**).

2. Proposals are hereby invited from eligible Consultants for preparation of Detailed Project Report of **preparation of Feasibility Study and Detailed Project Report for Improvement to Two Lane with Paved shoulder of**

- (1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727
- (2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa Ashram - Prakhand Gawnaha - Indo / Nepal Border
- (3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on NH-727
- (4) Areraj - Motihari in Bihar on EPC Mode.**DPR/BIHAR/NHD-MOD-PAT/02**

The Letter of Invitation (LOI) and Terms of Reference (ToR) including Request for Proposal (RFP) is available online on e-tender portal of MORT&H <https://morth.eproc.in>. The document can also be downloaded from MORT&H <https://morth.eproc.in> Cost of the Document in the form of a Non-refundable document fee of Rs.5,000 (Rupees Five Thousand only) in the form of Demand Draft favouring **“Regional Pay & Accounts Officer, Patna” and payable at Patna** must be furnished in a separate envelop while submitting the proposal.

3. **The RFP has also been uploaded on “INFRACON”(www.infracon.nic.in).As** such before submitting the proposal the Consultant shall mandatorily register and enlist themselves (thefirmandallkey personnel),on the MoRTH portal“ INFRACON”and furnish registration details along with its RFP.Acopy of Infracon Operation Procedure is also enclosed for bidder’s reference.

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

5. Bid must be submitted online at e-tenderportal of MORT&H <https://morth.eproc.in> on or before **07.01.2017(15:00hrs.)**

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

i) Dead line for downloading of bid **06.01.2017(17:00hrs.)**

ii) Last date for submission of queries: **26.12.2016(15:00hrs.)**

iii) Prebid meeting: **30.12.2016(11:30hrs.)**

iv) Deadline for Submission of bids : **07.01.2017(15:00hrs.)**

Yours sincerely,

**Executive Engineer, N.H. Division,
Gulzarbagh, patna**

Tel: 9470001312

Fax: <Fax>

E-mail: eenhgulzarbagh@gmail.com

Website: <Website>

Letter of Invitation(LOI)

No. DPR/BIHAR/NHD-MOD-PAT/02

Dated: 05-12-2016

Dear Sir,

Sub: Consultancy Services for preparation of Feasibility Study and Detailed Project Report for Improvement to Two Lane with Paved shoulder of

(1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727

(2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa Ashram - Prakhand Gawnaha - Indo / Nepal Border

(3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on NH-727

(4) Areraj - Motihari in Bihar on EPC Mode.**DPR/BIHAR/NHD-MOD-PAT/02**

1. Introduction

1.1 The MORT&H through Chief Engineer (N.H Wing), Road Construction Department, Govt. Of Bihar, Patna. has been entrusted with the assignment

of < **preparation of Feasibility Study and Detailed Project Report for Improvement to Two Lane with Paved shoulder of**

(1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727

(2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa Ashram - Prakhand Gawnaha - Indo / Nepal Border

(3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on NH-727

(4) Areraj - Motihari in Bihar on EPC Mode.**DPR/BIHAR/NHD-MOD-PAT/02**

MORT&H through Chief Engineer (N.H Wing), Road Construction Department, Govt. Of Bihar, Patna now invites proposal from Technical consultants for carrying out detailed project report as per details given in **Annexure-1**.

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

1.3 The **The MORT&H through Chief Engineer (N.H Wing), Road Construction Department, Govt. Of Bihar, Patna** invites Proposals (the **“Proposals”**) *through e-tender* (on-line bid submission) for selection of Technical Consultant (the **“Consultant”**) who shall prepare DPR. 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 can not submit two proposals / bids for the same package. A consultant (either as sole or as in JV / Association) can be awarded only upto 2 packages. Consultants are hereby invited to submit proposals in the manner as prescribed in the RFP. 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 Cost as mentioned in the RFP. Award of work to a Consultant with “a Particular Team” either Association JV / Association shall be limited to one package only. 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 MORT&H 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.

- 1.4 The consultants shall submit proposals either in sole capacity or in JV or in Association. Joint Venture/Association shall not have more than two firms. 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 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 PWD 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.
- 1.6 Financial Proposals will be opened only for the firms found to be eligible and scoring qualifying marks in accordance with Para-5 thereof. The consultancy services will be awarded to the highest ranking consultant on the basis of Quality and Cost.
- 1.7 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.
- 1.8 The proposals must be properly signed as detailed below:
 - 1.8.1
 - 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.*
 - 1.8.2 In case a Joint Venture/Association of firms, 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/Association (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/Association 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/Association*

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

1.8.3 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.

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

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

1.10 Bid Security

1.10.1 The applicant shall furnish as part of its Proposal, a Bid Security of Rs 2,00,000 (Rupee two lakhs only) in the form of a Bank Guarantee issued by one of the Nationalized/Scheduled Banks in India in favour of the **Executive Engineer, NH Division Gulzarbagh, Patna**. Payable at **Patna** (the "**Bid Security**") **valid for a minimum period of 150 days e.30 days beyond the validity of the bid) from the last date of submission of proposals.** This Bid Security is returnable not later than 30 (thirty) days from the date of Opening of the Financial proposals except in case of the two highest ranked Applicants. Bid Security of the Selected Applicant and the Second ranked Team shall be returned, upon the Selected Applicant signing the Agreement.

1.10.2 Any Bid not accompanied by the Bid Security of the required value and minimum required validity shall be rejected by the Authority as non-responsive.

- 1.10.3 The **MORT&H / RCD, Bihar** shall not be liable to pay any interest on the Bid Security and the same shall be interest free.
- 1.10.4 The Applicant, by submitting its Application pursuant to this RFP, shall be deemed to have acknowledged that with out prejudice to the **MORT&H / RCD, Bihar** any other right or remedy here under or in law or other wise, the Bid Security shall be forfeited and appropriated by the Authority as the mutually agreed pre-estimated compensation and damage payable to the Authority for, *inter alia* the time, cost and effort of the **MORT&H / RCD, Bihar** in regard to RFP including the consideration and evaluation of the Proposal under the following conditions:
- (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 the Selected Applicant, if the Applicant fails to reconfirm its commitments during negotiations as required vide Para 6
 - (c) 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 **15:00 hours 26.12.2016**. Any request for clarification in writing or by tele-fax/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 request by a Consulting firm, modify the Documents by amendment or corrigendum. The amendment will be uploaded on website <https://morth.eproc.in> & infracon also. The Client may at its discretion extend the deadline for the submission of proposals and the same shall also be uploaded on website <https://morth.eproc.in> & infracon also.

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 projects shall be submitted. Certificate should indicate clearly the firm's Design/DPR experience, in 2/4-/6-laning of highway, structures like bridges, Viaducts, tunnels, hillslope stabilization, rockbolting, 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.
- (iii) **Firm's turn over 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.
- (iv) **Document fee:** The fee for the document amounting to Rs.5,000 (Rupees Five Thousand only) in the form of Demand Draft favoring **Regional Pay & Accounts Officer, Patna** payable at **Patna** must be furnished in a separate envelope while submitting the proposal.
- (v) **Bid Security:** Bank Guarantee in support of bid security for an amount specified in Data Sheet and having validity for aminimum period of 150 days (i.e. 30 days beyond the validity of the bid) from the last date of submission of proposals in the Form E4.
- (vi) Power of Attorney on a stamp paper of Rs.100 and duly notarized authorizing to submit the proposal
- (vii) In case a Joint Venture/Association of firms, 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/Association as detailed at para 1.8.2 above

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 the 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 ,youmust give particular attention to the following:

Total assignment period is as indicated in the enclosed TOR. Amanning schedule in respect of requirement of key personnellis 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 under take the assignment. Additional support and administrative staff need to be provided for timely completion of the project with in the total estimated cost. It is stressed that the time period forth eassignment 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 a Consultant with a particular Team as in Form-T-2
- iii) Firm's references-Relevant Services carried out in the last even 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 part of the Technical proposal
- iv) Site Appreciation: limited to four A4 size pages in 1.5 space and 12 font including photographs, if any (Form-T-4).
- v) Comments on Terms of Reference: limited to two A4 size pages in 1.5 space and 12 font (Form-T-5).
- vi) The composition of the proposed Team and Task Assignment to individual personnel: Maximum three pages (Form-T-6).
- vii) 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: Maximum 4 pages (Form-T-7)
- viii) The proposal should clearly identify and mention the details of Material Testing lab facilities to be used by the Consultants for the project (Form-T-8). 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.
- ix) 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-9.
 - 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 during technical negotiation before award of the work. For out-sourced services, proposed firms/consultants should have such experience on similar projects

- x) Details of office equipment and software owned by the firm in Form-T10
- xi) CVs of Key Personnel in Form-T11.

3.2.4 CVs of Key Persons:

- i) *The CVs of the key personnel in the format as per Form T-11 is to be furnished. It may please be ensured that the format is strictly followed and the information furnished there 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. Experience certificates shall also be submitted. If any information is found incorrect, at any stage, action including termination and debarment from future **MORT&H / NHAI / IAHE / NHIDCL/ State PWD** projects up to 2 years may be taken by **MORT&H / RCD Bihar** on the personnel and the Firm.*
- ii. *No alternative to key personnel may be proposed and only one CV may be submitted for each position. 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 at the time of Contract Negotiations 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 or herwise 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, Highway cum Pavement Engineer, Bridge Engineer, Geo-technical cum material engineer and Senior Survey Engineer should be available from beginning of the project. 3 Key Personnel namely Environmental Specialist, Quantity Survey or/Documentation expert and Traffic and safety expert are allowed to be deployed/proposed in 2 team sata time. **If same CV is submitted by two or more firms, zero marks shall be given for such CV for all the firms.***
- iv. *The availability of key personnel must be ensured for the duration of the 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 of effect along with payslips are required to be submitted.

- v. *The age limit for key personnel is 70 years as on the date of bid submission except for Senior survey engineer in which case the age limit is 65 years. 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 currency 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 **MORT&H, NHAI, IAHE, NHIDCL & State PWD.***
- 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 few key personnel engaged for preparation of Detailed Project Report for the envisaged project may be ensured during first 3 to 4 months after start of the civil work at site during the period of survey and review of DPR by the Supervision consultant/Authority Engineer. For this purpose, payments shall be made as per actual site deployment to the key personnel at the man month rates quoted by the firm in their financial proposal.*
- 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 to 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 **MORT&H / RCD Bihar.** 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.*
- xiii) *Original Curriculum Vitae (CV) and photocopies of certificates shall be recently signed in blue ink by the proposed key professional staff on each page and also initialed by an authorized official of the Firm and each page of the CV must be*

signed. The key information shall be as per the format. Photocopy of the CVs will not be accepted. Unsigned copies of CVs shall be rejected.

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, geo technical investigation etc. This cost should be broken down into foreign and local costs. Your financial proposal should be prepared strictly using the format attached in **Appendix- IV**. Your financial proposal should clearly indicate the amount asked for by you without any assumptions of condition 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 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 **MORT&H** and the Consultant themselves would be required to obtain foreign currency to the extent quoted and accepted by **MORT&H**. Rate for foreign exchange for payment shall be at the rates established by RBI applicable at the time of making each payment installment on it involving actual transaction in foreign currency. No compensation done to fluctuation of 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.

4 Submission of Proposals

4.1 The Applicants shall submit the proposal (Proof of Eligibility and Technical Proposal) in hard bound form with all pages numbered serially and by giving an index of submissions. Applications submitted in other forms like spiral bound form; loose form etc shall be rejected. Copies of Applications shall not be submitted and considered. A Consultant with "a Particular Team" may submit only one hard copy (in original) of "proof of eligibility (Part I)" and "Technical Proposal (Part II)" to **Executive Engineer, NH Division Gulzarbagh, Patna.** for all the packages supplied by them with a particular team 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 only to be submitted online and no hard copy of the financial proposal should be submitted.

- 4.2 You must submit original proposal as indicated in the Data Sheet. “Proof of Eligibility” in original and hard bound should be enclosed in an envelope which should be marked as “Part-I –Proof of Eligibility”. Similarly, “Technical Proposal” in original and hard bound should be enclosed in an envelope which should be marked as “Part-II –Technical Proposal” The proposal will be sealed in an outer envelope which will be the address and information indicated in the Data Sheet and shall be submitted to **Executive Engineer, NH Division Gulzarbagh, Patna.** on or before the deadline for submission of bids. The envelope must be clearly marked:

Consultancy Package Nos. Project Name preparation of Feasibility Study and Detailed Project Report for Improvement to Two Lane with Paved shoulder of

(1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727

(2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa Ashram - Prakhanda Gawnaha - Indo / Nepal Border

(3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on NH-727

(4) Areraj - Motihari in Bihar on EPC Mode. **DPR/BIHAR/NHD-MOD-PAT/02**

Do not open, except in presence of the evaluation committee

- 4.2.1 This outer envelope will contain three separate envelopes. The first envelope containing “Proof of Eligibility” (which should be clearly marked), the second envelope containing “Technical Proposal” (which should be clearly marked) and the third envelope containing a demand draft of Rs. 5,000/- (cost of RFP), Bid Security of required amount and validity as mentioned in the RFP and Proof of Payment of application processing fees amounting to Rs. 1295/- to **M/s. C-1 India Pvt. Ltd.** Only one bid security and one DD of Rs 5000/ (as cost of Document) may be submitted by a consultant applying with a particular team for a number of packages. However for consultants applying with 2 teams, 2 nos of Bid Security of Rs 2 lakhs each and 2 nos of DD of Rs 5000/ each as mentioned in RFP have to be submitted.
- 4.2.2 The proposal must be prepared in indelible ink and must be 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 inter lineations 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 completed Proof of eligibility and Technical proposal (in hard copy) must be delivered on or before the time and date at the address stated in Data Sheet. Proof of

Eligibility, Technical Proposal and Financial Proposal for each package shall have to be submitted online also on or before the time and date at the address stated in Data Sheet

- 4.5 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 The proposals would be evaluated by a Committee constituted by **MORT&H / RCD Bihar**. 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 Security of required value and of validity equal or more than the minimum required validity
- iii) The firms(s) have required experience
- iv) The firms(s) have required turnover
- v) The documents are properly signed by the authorized signatories and whether the proposal contains proper POA as mentioned at para 1.8.1 above
- vi) The proposals have been received on or before the dead line of submission.
- vii) In case a Joint Venture/Association of firms, 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/Association as detailed at para 1.8.2 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 In the second stage the Technical proposal shall be evaluated as per the detailed evaluation criteria given in Data Sheet.

A proposal securing 75 points shall be declared pass in the evaluation of Technical Proposal. **The technical proposal should score at least 75 points 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 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 **MORT&H through Chief Engineer (N.H Wing), Road Construction Department, Govt. Of Bihar, Patna**. Shall invite fresh bids for this package. For finan

evaluation, total cost of financial proposal excluding Service Tax shall be considered. 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 can not 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, 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:

$$SF = 100 \times FM / F$$

(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:

$$S = ST \times T + SF \times f$$

Where,

S=Combined Score,

ST=Technical Score out of 100

SF=Financial Score out of 100

T and f are values of weight age for technical and financial proposal respectively as given in the Data Sheet.

5.5 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 JV/ Association 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” turn 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 **MORT&H** consider in the Financial Quote of H-1 bidder and H-2 Bidder limited to those packages. Procedure to be followed for awarding work based on QCB including assessment of least cost to **MORT&H** under special circumstances i.e. When a Consultant with “a Particular Team”

DELETED

turns out to be the most preferred bidder (H-1) in more than one package is given at givenat Annex-II.

6 Negotiations

6.1 Prior to the expiration period of proposal validity, the Client will not if the most preferred Consultant/ Bidder i.e. the highest ranking consultant in writing in registered letter, e-mail, or facsimile and invite him to negotiate the Contract.

6.2 **Before the start of negotiations, the most preferred Consultant/Bidder (H-1) shall be asked to give justification for the cost quoted by them to the full satisfaction of MORT&H through Chief Engineer (N.H Wing), Road Construction Department, Govt. Of Bihar, Patna.**

Each key personnel of the preferred consultant shall be called for interview at the time of negotiation at the cost of consultant before the award of work.

6.3 Negotiations normally take two to three days. The aim is to reach an agreement on all points and initial a draft contract by the conclusion of Negotiations.

6.4 Negotiations will commence with discussion on technical proposal, the proposed methodology (work plan), staff and any suggestions made to improve the TOR, the staffing and bar charts, which will indicate activities, period in the field and in the home office, staff months, logistics and reporting. The financial proposal is subject to rationalization. Special attention will be paid to optimize the required outputs from the Consultants within the available budget and to define clearly the inputs required from the Client to ensure satisfactory implementation of the Assignment.

6.5 Changes agreed upon will then be reflected in the financial proposal using proposed unit rates.

6.6 Having selected Consultants, among other things, on the basis of an evaluation of proposed key professional staff, the Client expects to negotiate, within the proposal validity period, a contract on the basis of the staff named in the proposal and, prior to contract negotiations, will require assurances that the staff will be actually available. **The Client may ask to give a replacement for the key professional who has scored less than 75% marks by a person of at least 75% score. No reduction in remuneration would be made on account of above change.**

The Client will not consider substitutions during contract negotiations except in cases of incapacity of key personnel for reasons of health. Similarly, after award of contract the Client expects all of the proposed key personnel to be available during implementation of the contract. The client will not consider substitutions during contract negotiations/ contract implementation except under exceptional circumstances. For the reason other than death/extreme medical ground, where replacement is proposed by the Consultant due to non availability of the originally proposed key personnel or in cases where replacement

has become necessary as a key personnel proposed by the Consultant has been found to be unsuitable for the project by **MORT&H / RCD Bihar** during contract negotiations/ contract implementation, the following shall apply (i) for total replacement up to 33% of key personnel, remuneration shall be reduced by 5% (ii) for total replacement between 33% to 50%, remuneration shall be reduced by 10% (iii) for total replacement beyond 50% and 66% remuneration shall be reduced by 15% (iv) for total replacement beyond 66% of the total key personnel, the Client may initiate action for debarment of such consultant for future projects of **MORT&H, NHAI, IAHE, NHIDCL & State PWD**. For a period of 6 months to 24 months. **If for any reason beyond the reasonable control of the consultants, it becomes necessary to replace any of the personnel, the consultants shall forth with provide as a replacement a person of equivalent or better qualification and experience.**

- 6.7 The negotiations will be concluded with a review of the draft Contract Agreement attached at Appendix-V. The Client and the Consultants will finalize the contract to conclude negotiations.
- 6.8 If a Consultant fails to conclude the negotiations with **MORT&H / RCD Bihar** or in case a consultant withdraws without starting /completing the negotiations with **MORT&H / RCD Bihar**, it shall attract penalty–encashment of Bid Security submitted by the Consultant

7 **Performance Security**

The consultant will furnish within 15 days of the issue of Letter of Acceptance (LOA), an Unconditional Bank Guarantee from a Nationalised 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 500 crore as per latest Annual Report of the Bank. In the case of a Foreign Bank (issued by a Branch in India) then 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 Nationalised 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 for an amount equivalent to **10%** of the total contract value to be received by him towards Performance Security valid for a period of **three years** beyond the date of completion of services, or end of civil works contract, whichever earlier. **The Bank Guarantee will be released by MORT&H / RCD Bihar upon expiry of 3 years beyond the date of completion of services, or end of civil works contract, whichever earlier, provided rectification of errors if any, found during implementation of the contract for civil work and satisfactory report by MORT&H / RCD Bihar in this regard is issued.** If a Consultant fails to submit the Performance Security (as specified above), it shall attract penalty–encashment of Bid Security submitted by the Consultant

8. **Penalty**

The consultant will indemnify for any direct loss or damage that accrue due to deficiency in services in carrying out Detailed Project Report. 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.

9. **Award of Contract**

After successful Negotiations with the selected Consultant the Client shall issue letter of award and ask the Consultant to provide Performance Security as in Para 7 above. If

negotiations (as per para 6 above) fail or the selected Consultant fail to provide performance security within the prescribed time or the Consultant fail to sign the Contract Agreement within prescribed time the Client may invite the 2nd highest ranking bidder Consultant for Contract negotiations and follow the procedure outlined in Para 6,9 and 10 of this Letter of Invitation.

10. **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.

11. 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
- x) Name of the bidders who is awarded the Contract

12. **Confirmation**

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

Thanking you.

Yours sincerely,

Encl. as above

**Executive Engineer,
NH Division Gulzarbag, Patna
Road Construction Department,
Bihar**

Details of the stretch proposed for DPR preparation

Consultancy Services preparation of Feasibility Study and Detailed Project Report for Improvement to Two Lane with Paved shoulder of

(1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727

(2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa Ashram - Prakhand Gawnaha - Indo / Nepal Border

(3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on NH-727

(4) Areraj - Motihari in Bihar on EPC Mode.**DPR/BIHAR/NHD-MOD-PAT/02**

S. No.	NH No.	Section	State	Tentative Length (inkm)	PackageNo.
1	2	3	4	5	6
1	New NH	Two Lane with Paved shoulder of (1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727 (2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa Ashram - Prakhand Gawnaha - Indo / Nepal Border (3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on NH-727 (4) Areraj - Motihari in Bihar on EPC Mode. DPR/BIHAR/NHD-MOD-PAT/02	Bihar	250	DPR/BIHAR/NHD-MOD-PAT/02

Procedure of Awarding Work based on QCBS including Assessment of Least Cost to MORT&H 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/Association 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 **MORT&H** 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 has 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

DELETED

	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
PackageNo.	Name of Consultants and 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	

DELETED

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 are as 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/New H-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	

DELETED

(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 **MORT&H** considering the Financial Quote of H-1 bidder and H-2 Bidder limited to those packages. The situation for least cost to **MORT&H** 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 / New H-2	Financial Bid of H-2/ New H-2 <u>minus</u> 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 / New H-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 = (+) 40 lakhs	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 = (+) 20 lakhs	
	200 lakhs	220 lakhs		

DELETED

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-2 in the remaining 4 packages are as mentioned below

	H-1 (New H-1)	H-2 (New H-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 Consultant S becomes the new H-2
	220 lakhs	240 lakhs	

(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 / New H-2	Financial Bid of H-2 / New H-2 <u>minus</u> Financial Bid of H-1	Remarks
Package-2	U(team-1)	X	240-210 = (+) 30 lakhs	
	210 lakhs	240 lakhs		
Package-7	U (team-1)	S	255 – 220 = (+) 35 lakhs	H-2 minus H-1 is Maximum. 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 packages i.e. package-2 is as mentioned below

	H-1 (New H-1)	H-2 (New H-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

DELETED

DATA SHEET

(References to corresponding paragraphs of LOI are mentioned along side)

1. **The Name of the Assignment and description of projects mentioned in Annex-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: Ministry of Road Transport & Highways through
Chief Engineer (NH Wing)
Road Construction Department, Bihar**

3. **Duration of the Project – 8 months**

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

Date: 30-12-2016

Time: 11:30 hours

Venue: Chief Engineer (NH Wing) Road Construction Department, Bihar

(Ref. Para 1.9)

5. **The Documents are:**

- | | |
|--------------------|-----------------------------------|
| i. Appendix-I: | Terms of Reference (TOR) |
| ii) Appendix-II | Formats for Proof of Eligibility |
| iii. Appendix-III: | Formats for Technical Proposal |
| iv. Appendix-IV: | Formats for Financial Proposal v. |
| Appendix-VI | Draft Contract Agreement |

(Ref. Para 2.1)

6. **Bid Security:Rs 2.0 Lakhs** (Ref Para 1.10)

7. **Tax and Insurance** (Ref. Para3.3.2)

(i). The Consultants and their personnel shall pay all taxes(including 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 Clause3.5 of Draft Contract Agreement.

8. **The number of copies of the proposal required to be submitted:**1 no. (ref. para4.1)

9. The address is---(Ref.para4.2)

**Executive Engineer,
NH Division Gulzarbag, Patna
Road Construction Department,
Bihar. Pin No. 800001
Mob.9470001312**

The envelopes must be clearly marked:

- i. Original Proposal;
- ii. Documents in proof of eligibility and technical proposal as appropriate; and,
- iii. Do not open,except in presence of the evaluation committee on the outer envelope.
- iv. ConsultancyPackageNo.:-----
- v. Project Name: -----
- vi. Name and Address of Consultant

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

Date 07-01-2017

Time 15:00

Address MORT&H website <https://morth.eproc.in>

(Ref. Para4.4)

11. Proposal Validity period(Numberof days): 120 days (Ref. Para4.5)

12. Evaluation criteria: (Ref. Para3&5)

12.1 First stage evaluation– eligibility requirement. (Ref. Para3.1&5.1)

Table-1: Minimum Eligibility Requirements

S.No.	Minimum experience and performance of Preparation of DPR 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	<p>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.100 km if the indicative length of the package is100km). 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.40km if the indicative length of the package is100km)or Feasibility Study of two/four/six laning of minimum 60% of the indicative length of the package (i.e.60km if the indicative length of the package is 100 km)</p> <p>Note: The experience of a firm in preparation of DPR for a private concessionaire/contractor shall not be considered</p>	Annual average turnover for last 3years of the firm should be equal to or more than Rs.5.00 Crores.

- i) The sole applicant shall fulfill all the requirements given in Table-1.
- (ii) Incase 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.
- (iii)If the applicant firm has/have prepared the DPR/FS projects solely on its own, 100% weightage shall be given. If the applicant firm has prepared the DPR/FS projects as a lead partner in a JV, 75% weightage shall be given. If the applicant firm have prepared the DPR 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 projects as an associate, 25% weightage shall begiven.

12.2 Second stage technical evaluation(Refer 5.2)

S.No.	Description	Points
1	Firm's relevant experience in last 7 years	25
2	Adequacy of approach and methodology	5
3	Material testing, survey & investigation, equipment and software proposed to be used	20
4	Qualification and relevant experience of the proposed key personnel	50
	Total	100

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

A. Firm's relevant experience in last 7 years

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

S.No	Description	Maximum Points	Sub-Points
1	Specific experience of the DPR consultancy related to the assignment for eligibility	15	
1.1	Aggregate Length of DPR / Feasibility study of 2/4/ 6 lane projects	7.5	
1.1.1	More than the indicative Length of the package applied for		5.5
1.1.2	More than 2 times the indicative length of the package applied for		6.5
1.1.3	More than 3 times the indicative length of the package applied for		7.5
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)	7.5	
1.2.1	1 project		5.5
1.2.2	2 projects		6.5
1.2.3	3 or more projects		7.5
2	DPR of Bridge having length more than 200 m	5	

S.No	Description	Maximum Points	Sub-Points
2.1	1 bridge		2
2.2	2 bridges		3
2.3	3 bridges		4
2.4	4 or more bridges		5
3	Specific experience of firms in terms of turnover	5	
3.1	Firm's Average Turnover of last 5 years \geq 10 crore		5
3.2	Firm Average Turnover of last 5 years \geq 5 crore but $<$ 10 crore		4
3.3	Firm Average Turnover of last 5 years $<$ 5 crore		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 Points	Sub-Points
1	Specific experience of the DPR consultancy related to the assignment for eligibility	12	
1.1	Aggregate Length of DPR / Feasibility study of 2/4/6 lane projects	6	
1.1.1	More than the indicative Length of the package applied for		4
1.1.2	More than 2 times the indicative length of the package applied for		5
1.1.3	More than 3 times the indicative length of the package applied for		6
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)	6	

S.No	Description	Maximum Points	Sub-Points
1.2.1	1 project		4
1.2.2	2 projects		5
1.2.3	3 or more projects		6
2	DPR of Bridge having length more than 200 m	4	
2.1	1 bridge		1
2.2	2 bridges		2
2.3	3 bridges		3
2.4	4 or more bridges		4
3	Specific experience of firms in terms of turnover	4	
3.1	Firm's Average Turnover of last 5 years \geq 10 crore		4
3.2	Firm Average Turnover of last 5 years \geq 5 crore but $<$ 10 crore		3
3.3	Firm Average Turnover of last 5 years $<$ 5 crore		0
4	DPR for special category projects (Special bridges/ tunnels or expressways, whichever applicable). It is to be noted that either 4.1 or 4.2 shall be applicable, and not both.	5	
4.1	DPR of number of special bridges/ tunnels (if applicable)	5	
4.1.1	1 project		1
4.1.2	2 projects		2
4.1.3	3 projects		3
4.1.4	4 projects		4
4.1.5	5 or more projects		5
4.2	Aggregate length of DPR/ Feasibility study for expressways	5	

S.No	Description	Maximum Points	Sub-Points
4.2.1	Upto 50km		2
4.2.2	50km to 100km		3
4.2.3	100km to 150km		4
4.2.4	More than 150 km		5

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)

B. Adequacy of approach and methodology

S.No	Description	Points
1	Site appreciation	2
2	Comments on TOR	1
3	Team composition and task assignment	1
4	Methodology	1
	Total	5

C. Material testing, survey and investigation, equipment and software proposed to be used

S.No	Description	Maximum Points	Sub-Points
1	Availability of in-house material testing facility	2	
1.1	Available		2
1.2	Outsourced		1
1.3	Not Available		0
2	Field Investigation Facilities	3	
2.1	Available		3
2.2	Outsourced		1.5
2.3	Not Available		0
3	Office Equipment and Software	3	

S.No	Description	Maximum Points	Sub-Points
3.1	Available		3
3.2	Outsourced		1.5
3.3	Not Available		0
4	Experience in LiDAR or equivalent technology for topographic survey	4	
4.1	1 project		1
4.2	2 projects		2
4.3	3 projects		3
4.4	4 or more projects		4
5	Experience in using GPR and Induction Locator or equivalent technologies for detection of sub-surface utilities	4	
5.1	1 project		1
5.2	2 projects		2
5.3	3 projects		3
5.4	4 or more projects		4
6	Experience in digitization of cadastral maps for land acquisition	4	
6.1	1 project		1
6.2	2 projects		2
6.3	3 projects		3
6.4	4 or more projects		4

D. Qualification and relevant experience of the proposed key personnel

The weightage for various key staff is as under:

S.No	Key personnel	Points
-------------	----------------------	---------------

S.No	Key personnel	Points
1	Team Leader- Senior Highway Engineer	10
2	Senior Bridge Engineer	7
3	Highway cum Pavement Engineer	7
4	Material-cum-Geo-technical Engineer- Geologist	7
5	Traffic and Safety Expert	6
6	Senior Survey Engineer	5
7	Environment Specialist	5
8	Quantity Surveyor/Documentation Expert	3
	Total	50

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

S.No	Description	Maximum Points	Sub-Points
1	General Qualification	25	
1.1	Essential education qualification		20
1.2	Desirable education qualification		5
2	Relevant experience and adequacy for the project	65	
2.1	Total professional experience		15 (max)
2.1	Experience in Highway Projects (Bridge Projects for Senior Bridge Engineer)		25 (max)
2.2	Experience in Similar Capacity		25 (max)
3	Employment with the Firm	10	
3.1	Less than 1 year		0
3.2	1 year to 2 years		5
3.3	> 2 years		10

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 incase 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 5.3of Letter of Invitation shall be opened.

The consultancy services will be awarded to the consultants coringhighest marks in combined evaluation of Technical and Financial proposals in accordance with clause1.3 and 5.4 here of.

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. Para3.3.3)

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 contractat locations as required for the project stretch stated in TOR.(Ref. Para1.2 ofLOIand 2.3of GCC/SC)

APPENDIX I

TERMS OF REFERENCE (TOR)

Consultancy Services for **preparation of Feasibility Study and Detailed Project Report for Improvement to Two Lane with Paved shoulder of**

(1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727

(2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa Ashram - Prakhanda Gawnaha - Indo / Nepal Border

(3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on NH-727

(4) Areraj - Motihari in Bihar on EPC Mode. **DPR/BIHAR/NHD-MOD-PAT/02**

Terms of Reference for Consultancy Services (TOR)

1. General

1.1 **The MoRTH through Chief Engineer (N.H Wing), Road Construction Department, Govt. Of Bihar, Patna** has been entrusted with **the assignment of Two Lane with Paved shoulder of**

(1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727

(2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa Ashram - Prakhand Gawnaha - Indo / Nepal Border

(3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on NH-727

(4) Areraj - Motihari in Bihar on EPC Mode. **DPR/BIHAR/NHD-MOD-PAT/02**

The MoRTH through Chief Engineer (N.H Wing), Road Construction Department, Govt. Of Bihar, Patna now invites proposal from Technical consultants for carrying out detailed project report as per details given in **Annexure-1**.

1.2 **The MORT&H through Chief Engineer (N.H Wing), Road Construction Department, Govt. Of Bihar, Patna** will be the employer and executing agency for the consultancy services and the standards output required from the appointed consultants are of international level both in terms of quality and adherence to the agreed time schedule.

1.3 Ministry has recently awarded works of consultancy services for construction of ROBs for replacing level crossings in various states .Incase a level crossing existsina project reach ,consultant is required to co-ordinate with those consultants and finalise 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 **Two Lane with Paved shoulder** 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 existingand/or construction of new bridges and structures, road safety features, quantities of various items of works and cost estimates and economic analysis.

- 2.3 The Detailed Project Report 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.
- 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 feasibility stage, employer desire to terminate the contract, the contract will be terminated after payment up to that stage.

3. Scope of Services

- 3.1 As far as possible, the widening/improvement work to **Two Lane with Paved shoulder** shall be within the existing right of way avoiding land acquisition, except for locations having inadequate width and where provisions of short bypasses, service roads, alignment corrections, improvement of intersections are considered necessary and practicable and cost effective. However bypasses proposals should also be considered, wherever in urban areas, improvement to **Two Lane with Paved shoulder** of the existing road is not possible. The Consultant shall furnish land acquisition details as per revenue records/maps for further processing of land acquisition. Consultant shall also submit 3a, 3A and 3D draft notification for acquisition of land.
- 3.2 The Consultant shall study the possible locations and design of toll plaza, if applicable to the project. Way side amenities required on tolled highway shall also be planned. 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.
- 3.3 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 and the TOR. 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
- 3.4 All ready to implement 'good for construction' drawings shall be prepared.
- 3.5 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.

- 3.6 *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 Railway require proof checking of the drawings prepared by the consultants, the same will be got done by **MORT&H** and payment to the proof consultant shall be made by **MORT&H** 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 competent authority within MoRTH and its implementation agencies, as applicable. 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.*
- 3.7 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 **MORT&H/ RCD Bihar**.
- 3.8 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.
- 3.9 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.
- 3.10 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) (the "Manual") along with relevant IRC codes for design of long bridges.
- 3.11 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 **MORT&H/ RCD Bihar**. And its Financial Consultant and the Legal Adviser by furnishing clarifications as required for the financial appraisal and legal scrutiny of the Project Highway and Bid Documents.
- 3.12 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 habitants, involuntary resettlement etc.*
- ii(a). Public consultation including consultation with Communities located along the road, NGOs working in the area, others take-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 survey using mobile/ aerial LiDAR or equivalent technology*
- 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 ,it sx-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 under passes etc.*
- xiii. Identification of the type and the design of intersections;*
- xiv. Design of complete drainages 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 chedule for LA: reports documents and drawings arrangement of estimates for cutting/ transplating of trees and shifting of utilities from the concerned department;*
- xix *To find out financial viability of project for implementation and suggest the preferred mode on which the project is to be taken up.*
- xx. *Preparation of detailed project report,cost estimate,approved for construction Drawings,rate analysis,detailed bill of quantities,bid documents fo rexecution of civil works through budgeting resources.*
- xxi. *Design of toll plaza and identification of their numbers and location and office cum residential complex including working drawings*
- xxii. *Design of weighing stations, parking areas and rest areas.*
- xxiii. *Anyother user oriented facility en-routetoll facility.*
- xxiv.*Tie-in of on-going/sanctioned works of MORT&H/ NHAI/ other agencies.*
- xxv. *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 there ports 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 necessaryto improve efficiency and safety.

4.5 Standards and Codes of Practices

All activities related to field studies,designand documentation shall be done as per the latest guidelines/circulars of MoRT&Hand relevant publications of the Indian Roads Congress (IRC) and Bureau of Indian Standards (BIS).For aspects not covered by IRCand BIS,international standards practices, may be adopted. The Consultants,up onward of the

Contract, may finalize this in consultation with **MORT&H/ RCD Bihar**. 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)

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 of the completion of work. The detailed Draft QAP Document must be discussed and finalized with the concerned **MORT&H/ RCD Bihar**. officers immediately upon the award of the Contract and submitted as part of the inception report.

It is imperative that the QAP is approved by **MORT&H/ RCD Bihar**. Before the Consultants start the field work.

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-going works 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 OpticalCable, O/H and U/G Electric, Telephoneline,Watermains, 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.NR.	Description	Number of Survey Stations
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

2. The number of survey locations indicated in the table above are indicative only. The Consultants shall, immediately upon award of the work, submit to **RCD Bihar** proposals regarding the total number as well as the locations of the traffic survey stations as put 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 **RCD Bihar**.

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. 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 equivalent technologies.
2. Consultant shall use ATCC systems that can meet the following accuracy levels after validation/ correction:

- (a) Classification of vehicles: better than 95%
- (b) Counting of vehicles: better than 98%

Before validation and correction, 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 on a sampling basis.

3. ATCC systems such as Pneumatic Tube Detector, Inductive Detector Loop, Video Image Detection, and Infrared Sensor or equivalent technologies shall be adopted.
4. The classified traffic volume count surveys shall be carried out for 7 days (continuous, direction-wise) at the selected survey stations. The vehicle classification systems as given in relevant IRC code may be followed. However, the following generalised classification system is suggested in view of the requirements of traffic demand estimates and economic analysis:

Motorised Traffic		Non-Motorised Traffic	
2-Wheeler		Bi-Cycle	
3-Wheeler		Cycle-Rickshaw	
Passenger Car		Animal Drawn Vehicle(ADV)	
Utility Vehicle (Jeep, Van etc.)		Hand Cart	
		Other Non-Motorised Vehicle	
Bus	MiniBus Standard Bus		
LCV	LCV-Passenger LCV-Freight		
Truck	MCV : 2-Axle Rigid Chassis		
	HCV : 3-Axle Rigid Chassis		
	MAV		Semi Articulated
			Articulated

5. All results shall be presented in tabular and graphical form. The survey data shall be analysed 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 **MORT&H/ RCD Bihar**. These will be essentially required around congested towns to delineate through traffic. The road side interviews shall be 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 analysed 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.

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 **RCD Bihar** 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.

2. 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 roads tretchonarandom sample bas is normally for trucks only (both empty and loaded trucks) for 2 normal days -(24hours) at special count stations to be finalized in consultation with **RCD Bihar**. 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.Further more,the data from axle load surveys should be analysed to bring out the Gross VehicleWeight(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:

These may be conducted to determine if provision of viaduct for pedestrians/animals is necessary to improve the traffic safety.

4.9.8 TruckTerminal Surveys

The data derived from the O-D, speed-delay, other surveys and also supplementary surveys should be analysed to assess requirements for present and future development of truck terminals at suitable locations enroute.

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. Over all 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.**
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, ROB's/ 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 landwidth, 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*
 - xiv. 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 up on 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 **MORT&H/ RCD Bihar**. 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 2 cm or better (b) Fundamental vertical accuracy of 2 cm 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/ Data of points captured for the entire highway length and adjoining areas of interest (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 1 m in *.dwg format.
 4. For land based surveys, Mobile LiDAR (Light Detection and Ranging) or equivalent technology that can meet above requirements shall be adopted. For aerial based surveys, Aerial Mobile LiDAR (Light Detection and Ranging) or equivalent technology that can meet above requirements shall be adopted. In shadow areas such as invert levels below culverts, where LiDAR or equivalent technologies cannot survey accurately, traditional methods of Total Station/ Auto Level shall be used to complete the study.
 5. In case of mobile LiDAR or equivalent technology, 360 degree panoramic images of the entire highway length and adjoining areas of interest shall be submitted. In case of aerial LiDAR or equivalent technology, ortho-images of the entire highway length and adjoining areas of interest shall be submitted.
 6. 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 equivalent 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 **MORT&H.***
- vi. *Collection / Extraction of details for all feature ssuchas 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 0.3 metre) 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 to form bankment 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 30m 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 by passing the congested locations, the traverse lines would be run along the possible alignments in order to identify and select the most suitable alignment for the bypass. The detailed topographic surveys should be carried out along the bypass alignment approved by <Agency>. At locations where grade separated inter sections 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 development 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 a minimum of 100m on either side of the road centre line and will be of sufficient width to allow improvements, including grade inter section to be designed.*

5. 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 15cm X 45cm shall be cast in RCC of grade M15 with a nail fixed in the centre of the top surface. The reference pillar shall be embedded in concrete up to a depth of 30cm with CC M10 (5cm wide all around). The balance 15cm above ground shall be painted yellow. The spacing shall be 250m apart, in case Bench Mark Pillar coincides with Reference Pillar, only one of the two need be provided.*
- ii. *Establishing Benchmarks at site connected to GTS Benchmarks at an interval of 250 metres on Bench mark pillar made of RC as mentioned above with RL and BM No. marked on it with red paint.*
- iii. **Boundary Pillars**-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.

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 at every 1 m interval, at the locations of curve points, small streams, and intersections and at the locations of change in elevation.*
- ii. Crosssections at every 1 m interval in full extent of survey covering sufficient number of spot levels on existing carriageway and adjacent ground for profile correction course and earthwork calculations. Cross sections shall be taken at closer interval at curves.*
- 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 Bridge and Culverts) and provisions of IRC:5 (“Standard Specifications & Code of Practice for Road Bridges, Section 1– General Features of Design”).*

At feasibility study stage cross sections at 50m interval may be taken.

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. The following criteria shall be met by the process of sub-surface utility mapping: (a) Coverage and mapping of all sub-surface utilities within project RoW, especially those under additional carriageway width (b) Accurate mapping and resolution of all sub-surface utilities up to a depth of 4 m (c) Differentiation between sub-surface utilities such as live electric cables, metallic utilities and other utilities (d) Sub-surface utilities radargrams further processed into utility maps in formats such as PDF, JPEG and AutoCAD. To meet the accuracy levels, consultant shall use Ground Penetrating Radar, Induction Locator or equivalent 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 L.A 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. 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 kilometer;*
 - iii. *Carriage way width, surfacing type @ every 500 mand every change of feature which ever is earlier;*
 - iv. *Shoulder surfacing type and width @ every 500 mand every change of feature which ever is earlier;*
 - v. *Sub-grade / local soil type (textural classification)@ every 500 mand every change of feature which ever is earlier;*
 - vi. *Horizontal curve; vertical curve*
 - vii. *Road inter section 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. *Heigh to fem bank mentor depth of cut @ every 200 mand every change of feature which ever is earlier.*
 - xi. *Land width i.e. ROW*
 - xii. *Culverts, bridges and other structures (type, size, span arrangement and location)*
 - xiii. *Road side arboriculture*
 - xiv. *Existing utility services on either side within ROW.*
 - 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*
 - *sub grade type (textural classification) and condition (dry, wet)*

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 (surfaced is tress 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 area affected;*
- *edge break, length (m); and,*
- *rut depth, mm*

Shoulder Condition

- *Paved: Same as for pavement*
- *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. *The pavement condition surveys shall be carried out using visual means. 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.*
- iv. *The shoulder and embankment conditions shall be evaluated by visual mean sand 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.

- v. *For sections with severe distresses, additional investigations as appropriate shall be carried out to determine the cause of such distresses.*
- vi. *Middle 200m could be considered as representative sample for each one km. of road and incase all other things are considered similar.*

Drainage Condition

- *General condition*
- *Connectivity of drainage turn outs into the natural topography*
- *Condition in cut sections*
- *Condition at high embankments*

The data obtained from the condition surveys should be analysed 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 out using Bump Integrator or similar instrument. The methodology for the surveys shall be as per the widely used standard practices. The calibration of the instrument shall be done as per the procedure given in the World Bank's Technical Publications and duly got authenticated by established laboratory/institution acceptable to the client*
- 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 directions.*
- 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 analysed using the cumulative difference approach to identify road segments homogenous with respect to surface roughness.*

4. Pavement Structural Strength

- i. *The Consultants shall carry out structural strength surveys for existing pavements using Benkelman Beam Deflection technique in accordance with the CGR A procedure given in IRC:81-1997("Guidelines for Strengthening of Flexible Road Pavements Using Benkelman Beam Deflection Technique").*
- ii. *It is suggested that the deflection surveys may be carried out as per the scheme given below:*
 - *Main line testing; and,*
 - *control section testing.*
- iii. *The deflection tests for the main line shall be carried out at every 500m along the road sections covered under the study. The control section testing shall involve carrying out deflection testing for each 100m 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 beat an interval of not more than 10 m.

- iv. Test pits shall be dug at every 500m 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.
- v. Benkelman Beam Deflection 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 **RCD Bihar** the scheme describing the testing schedule including the interval. The testing scheme shall be supported by data from detailed reconnaissance surveys.

*In case, the Consultants wish to use any acceptable method(s) other than Benkelman Beam deflection technique for the evaluation of pavement strength, viz.Falling weight deflectometer method etc. details of such methods or innovative features for deflection testing using Benkelman Beam technique 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 **MORT&H/ RCD Bihar**. The sources of such methods should be properly referenced.*

4.11.3.3 Sub grade Characteristics and Strength

1. 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 road along new alignments, the test pits for subgrade 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. *FieldCBR using DCP at each test pit*
 - iii. *Characterization (grain size and At terberg limits) at each test pit and,*
 - iv. *Laboratory moisture-density characteristics (modified AASHTO compaction);*

- v. *Laboratory CBR (un soaked 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 the se soils shall be finalized in consultation with the **MORT&H/ RCD Bihar**. Officers after the problematic soil types are identified along the road sections.
 5. The laboratory for testing of material should be got approved from **MORT&H/ RCD Bihar** 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, via ducts, ROBs, RUB and other grade separated structures, culverts, etc.) along the road under the project. The inventory for the bridges, via ducts and ROBs shall include the parameters 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 parameters.

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”). The investigations shall be carried out for all existing drainage structures along the road section 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 floods situation, general direction of river course through structure, afflux, extent and magnitude of flood, effect of back water, 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 the design of bridges. The detail 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, rain fall statistics, top soil characteristics, vegetation cover etc. so as to assess the catchment area and hydraulic parameters 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), hightide level(HTL),lowtide level(LTL)where applicable, discharge velocity etc. from available past records ,local inquiries and visible signs,ifany,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 cope 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 parameters 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.
2. 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 followings cenarios:
 - 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 indicated is tress of serious nature leading to doubt about structuraland / 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 takeup load testing of bridges.Road closure for testing if unavoidable shall be arranged by **RCD Bihar** for limited duration say12 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	Over all length = 6 – 30m	One abutment location and One abutment location and at least one intermediate location between abutments for structures having more than one span
2	Over all length = 30– 60 m	One abutment location and at least one intermediate location between abutments for structures having more than one span.
3	Over all 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 **MORT&H/ RCD Bihar**.
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 finalise the bore hole locations in consultation with the **MORT&H/ RCD Bihar** 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 **RCD Bihar** for approval. These may be finalized in consultation with **MORT&H/ RCD Bihar**.
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 2m 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 are as,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 by products,recycle able 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 the 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. The Material 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 over lay for the existing road, paved shoulders, medians, verges;*
 - iii. *Bridges, viaduct/subways and other grades eparated 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 treeplanting/fencing atlocations where necessary / required*
 - ix.. *Toll plazas and office-cum-residential complex for PIU(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 **MORT&H/RCD Bihar.**
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 of 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 work out 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 animals.
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 on 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 2 lane 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 their liability of traffic predictions. Further more ,the methodology adopted for the design of pavement shall be complete with flow charts indicating the various steps in the design process, their interaction with one another and the input parameter required at each step.
5. For the design of over lays for the existing 2-lane pavement, the strengthening requirement shall duly take into account the strength of the existing pavement is-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.
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.
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 flyash wherever available within economical leads must be considered .In accordance with Government instructions, **use of flyash within 100km from Thermal Power Stations is mandatory.**
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 analysed to determine the following:
 - i. HFL
 - ii. LWL
 - iii. LBL
 - iv. Erodibility of bed/scourlevel
 - v. Design discharge
 - vi. Linear waterway and effective linear waterway
 - vii. Likely foundation depth
 - viii. Safe bearing capacity
 - ix. Engineering properties of subsoil
 - x. Artesian conditions
 - xi. Settlement characteristics
 - xii. Vertical clearance
 - xiii. Horizontal clearance
 - xiv. Freeboard 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 Plan showing 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, crosssection, deck level, founding level, type of bridge components (superstructure, substructure, foundations, bearings, expansion joint, return walls 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 **MORT&H/ RCD Bihar** 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/waterway channels shall be got approved from the concerned Irrigation/Waterway Authorities. Subsequent to approval of GAD and alignment plan by **MORT&H** 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 **MORT&H** 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 **MORT&H**, 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 **MORT&H**.

4.12.7. Drainage System

1. The requirement of road side 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 road side 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 every5 km. stretch of road shall be prepared.

4.12.8. Traffic Safety Features ,Road Furniture and Road Markings

The Consultants shall design suitable traffic safety features and road furniture including traffic signals ,signs, markings ,overhead signboards ,crashbarriers, delineators etc. The locations of these features shall be given in the reports and also shown in the drawings.

4.12.9. Arboriculture and Landscaping

The Consultants shall workout 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 be a utify the highway and making the environment along the highway pleasing.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 **MORT&H**.
2. Toll Plaza shall be designed as per IRC 84.

4.12.11. Weighing Station, Parking Areas and Rest Areas

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 petrolpump,the guidelines is issued by OISD of Ministry of Petroleum shall be followed .The facilities should be planned to beat approximately 50 km interval. Atleast each facility (1no.) is foreseen to be provided for this project stretch. Weighing stations can be located near tollplazas so that overloaded vehicles can be easily identified and suitably penalized and unloaded be fore being allowed to proceed further .The type of weighing system suitable for the project shall be brought out in the report giving merit so feach type of the state-of-the art and basis of recommendations for the chosen system.

4.12.12 Office-cum-Residential Complex for PIU-Deleted

4.12.13 Miscellaneous Works

1. The Consultants shall make suitable designs and layout for miscellaneous works including rest areas, busbays, vehicle parking areas, telecommunication facilities etc. wherever appropriate.
2. The Consultants shall prepare the detailed scheme and layout 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 undertake 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 /NHAI .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 in 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 are view of their location,
 - (c) Highway side landscape and enhancement of the road junctions,
 - (d) Enhancement of highway side waterbodies, and
 - (e) Redevelopment of the borrow areas located on publicland.
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 **MORT&H through Chief Engineer (N.H Wing), Road Construction Department, Govt. Of Bihar, Patna.** 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.

4.13.2 Social Assessment

- 1 The consultant would conduct baseline 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 stake holders.A summary of stake holder discussions,issue raised and how the project design was developed to meet stakeholders need would be prepared.
- 2 The consultant shall prepare LandAcquisition Plan and assist **MORT&H/ RCD Bihar** in acquisition of land under various Acts.

4.13.2.3 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 the reis no further influx of people into the project area. All consultations with affected persons (to include list of participants) should be fully documented and records made available to **RCD Bihar.**

- 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 **MORT&H/RCD Bihar**, till the acceptance of the reports by the **MORT&H/ RCD Bihar**.

4.13.3 Reporting Requirements of EIA

- The consultant would prepare the stand-alone reports as per the requirement of the ADB/World Bank / **MORT&H/ RCD Bihar**, 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/ World Bank / **MORT&H/RCD Bihar**, till the acceptance of the reports by the ADB/ World Bank / **MORT&H/ RCD Bihar**, 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/ **MORT&H/ RCD Bihar**, till the acceptance of the reports by the ADB/World Bank / **MORT&H/ RCD Bihar** as applicable.

4.13.4 Reporting requirements of RAP

Analysis on the resettlement plan be conducted based on ADBs HandBook 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 landacquisition procedures to indicate clearly what steps and actions will be taken at different stages and the timeframe
- 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. 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 various components of the projects. The estimation of quantities and costs would have to be worked out separately for civil work Packages 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 man power, machinery and materials.
3. The project cost estimates prepared for **MORT&H/ RCD Bihar** /ADB/WB projects are to be checked against rates for similar on-going works in India under **MORT&H/ RCD Bihar** / WorldBank/ ADB financed road sector projects.

6. Viability and Financing Options

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 parameters and the rationale for their selection for the economic and commercial analyses shall be clearly brought out and got approved by **MORT&H**.
3. For models to be used for the economic and the commercial analyses, the calibration methodology and the basic parameters adapted to the local conditions shall be clearly brought out and got approved by **MORT&H/ RCD Bihar**
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 a 30-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. Further more, sensitivity of EIRR and NPV worked out for different scenarios as give under:

<i>Scenario – I</i>	<i>Base Costs and Base Benefits</i>
<i>Scenario - II</i>	<i>Base Costs plus 15% and Base Benefits</i>
<i>Scenario - III</i>	<i>Base Costs and Base Benefits minus 15%</i>
<i>Scenario - IV</i>	<i>Base Costs plus 15% and Base Benefits minus 15%</i>

The sensitivity scenarios given above are only indicative. The Consultants shall select the sensitivity scenario taking into account possible construction delays, construction cost overrun, traffic volume, revenue short falls, 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 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

1. It is envisaged that the project stretch should be implemented on EPC/BOT basis, there fore, the Consultant shall study the financial viability of the project under a commercial format and under different user fee scenarios and funding options. The Consultants shall submit and finalize in consultation with the **MORT&H/ RCD Bihar** officers the format for the analysis and the primary parameters and scenarios that should be taken into account while carrying out the commercial analysis. The financial model so developed shall be the property of **MORT&H/ RCD Bihar**.
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. The sensitivity analysis should be carried out for a number of probabilistic scenarios.
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 over run, 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 consultant shall suggest positive ways of enhancing the project Viability and furnish different financial models for implementing on BOT format.

7. Time period for the service

1. Time period envisaged for the study of the project is indicated in **Annex-I to LOI**. The final reports ,drawings and documentation shall be completed within this time schedule.
2. **MORT&H/ RCD Bihar** 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 times o 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 Enclosure I as per client's assessment.
 3. A Manning Schedule for key personnel mentioned above is enclosed as Enclosure I along with broad job-description and qualification as Enclosure II. The information furnished in Enclosures I & II 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. All the key personnel mentioned 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 the same 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 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 projects emanating from 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 **MORT&H/ RCD Bihar** 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 **MORT&H/ RCD Bihar** before commencement of the services.
 5. The Consultant shall maintain an Attendance Register to be signed by each individual key personnel at site as well as at Head Office. The Consultant shall furnish certificate that all the key personnel as envisaged in the Contract Agreement have been actually deployed in the Projects at the time of submission of their bills to the **MORT&H/ RCD Bihar** from time to time.
- 9. Reports to be submitted by the Consultant to **MORT&H/ RCD Bihar****
- 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 six stages as brought out below. 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
 - Stage 1: Inception Report**
 - Stage 2: Feasibility Report**
 - Stage 3: LA & Clearances I Report**
 - Stage 4: Detailed Project Report (DPR)**

Stage 5: Technical Schedules

Stage 6: LA & Clearances II Report

- 9.3 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 **MORT&H/ RCD Bihar**

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 III. Further, the reports shall also be submitted in floppy diskettes/CD's in addition to the hardcopies as mentioned in Enclosure-III. Consultant shall submit all other reports mentioned specifically in the preceding par as of the TOR.
2. The time schedule for various submissions prescribed at s.l.no.1 above shall be strictly adhered to. No time-over-run 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 so advised to start necessary survey works from the beginning so as to gain time in respect of various other activities in that stage.

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 **MORT&H/ RCD Bihar**

2. The data formats proposed by the Consultants for use in field studies and investigations shall be submitted within 14 days after the commencement of services and got approved by **MORT&H/ RCD Bihar**

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 **MORT&H/ RCD Bihar** 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) finalised in consultation with **MORT&H/ RCD Bihar**.*
 - 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 **MORT&H**.

STAGE 2:

10.3 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. *Over view of **MORT&H/ RCD Bihar** 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. *Economic and financial analysis*
- xii. *Conclusions and recommendations*

2. In view of para 1 above the consultant has to submit the following documents in six 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 Road 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, labour rates, 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 **MORT&H/RCD** shall comments from **MORT&H/ RCD Bihar** on draft feasibility study report.

STAGE 3:

10.4 Strip Plan and Clearances

1. The Consultants shall submit the following documents:

- i. *Details of the centerline 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 to the Service Departments;*
- vii. *Detail schedules for acquisition of additional land and 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 there of 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 accountin 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 **MORT&H /RCD Bihar**
 5. Kilometre-wise Strip Plans for section(Package) shall be prepared separately for each concerned agency and suggested by **MORT&H /RCD Bihar**

10.5 Land Acquisition Report

1. The Land acquisition report shall be prepared and submitted for section(package). The report shall include detail schedules about acquisition of land holdings as per revenue records and their locations in a strip plan and also the costs as per district authorities. Details shall be submitted in land acquisition proforma to be supplied by **MORT&H /RCD Bihar**. The land acquisition report shall be submitted in both Hindi and English languages.
2. The land acquisition report should be prepared in consultation with affected persons, non-governmental organizations and concerned government agencies and should cover land acquisition and resettlement plan and costs of resettlement and rehabilitation of such affected persons. It should also include plan of compensating afforestation, its land requirement with specific locations and cost involved for undertaking all activities in this regard.

10.6 Deleted

STAGE: 4

10.7 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.*

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, tunnel and cross-drainage structures. The sub-soil exploration report including the complete details of boring done, analyse and interpretation of data and the selection of design parameters 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 where in it has not been possible to strictly adhere to the

design standards due to the existing site conditions, restrictions and other considerations. The report should clearly bring out the details of the 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 loads 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 include details of sampling, testing and test results obtained in respect of 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 items of 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 in scale 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, cross-section and profile drawings shall be finalised in consultation with the concerned **MORT&H /RCD Bihar** 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, bus bays, parking areas etc.*
- *The typical cross-section drawings should indicate the scheme for future widening of the carriage way. 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.*

10.8. 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 **MORT&H /RCD Bihar** on the draft DPR shall be submitted as per the schedule given in Enclosure-III.

STAGE: 5

10.9. Technical Schedules

1. Civil Work Contract Agreement: A civil works contract agreement shall be submitted

STAGE: 6

10.10. LA & Clearances II Report

1. Draft 3a, 3A, 3D notification shall be submitted by the consultant.
2. All the necessary project related clearances such as environment, forest and wildlife clearance from MOEF, Railways in respect of ROB/ RUBs, Irrigation Deptt and any other concerned agencies shall be obtained by the consultant. The final approvals shall be obtained and submitted to **MORT&H /RCD Bihar** so that project implementation can straight away proceed without any hold up. For utility clearances, consultant shall prepare draft utility shifting estimates using the latest Schedule of Rates and obtain final approval from utility agency and **MORT&H** .

11. Interaction with **MORT&H /RCD Bihar**

1. During entire period of services, the Consultant shall interact continuously with **MORT&H /RCD Bihar** and provide any clarification as regards methods being followed and carryout modification as suggested by **MORT&H /RCD Bihar** . A programme of various activities shall be provided to **MORT&H /RCD Bihar** and prior intimation shall be given to **MORT&H /RCD Bihar** regarding start of key activities such as boring, survey etc. so that inspections of **MORT&H /RCD Bihar** officials could be arranged in time.
2. The **MORT&H /RCD Bihar** officers and other Government officers may visit the site at any time, individually or collectively to acquaint/ supervise the field investigation and survey works. **MORT&H /RCD Bihar** 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 **MORT&H /RCD Bihar**. 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. The floppy diskettes/CD's containing all basic as well as the processed data from all field studies and investigations, report, appendices, annexure, documents and drawings shall be submitted to **MORT&H /RCD Bihar** at the time of the submission of the Final Report. The data can be classified as follows:

- Engineering Investigations and Traffic Studies: Road Inventory, Condition, Roughness, Test Pit (Pavement composition), Benkelman Beam Deflection, Material Investigation including test results for subgrade soils, Traffic Studies (traffic surveys), axleload surveys, Sub-soil Exploration, Drainage Inventory, Inventory data for bridge and culverts indicating rehabilitation, new construction requirement etc. in MSEXCEL or any other format which could be imported to widely used utility packages.*
- Topographic Surveys and Drawings : All topo graphic 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 dwg format.*
- 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 **MORT&H /RCD Bihar** 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 **MORT&H /RCD Bihar** 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

S. No.	Clause No. of TOR	<i>Additional points</i>
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, land slide control/protection measures snow drift 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.

- | | |
|--|---|
| | <ul style="list-style-type: none">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/ |
|--|---|

		<p>protection works, slope stabilization measures, snow drift control measures, avalanche protection measures</p> <p>f) Existing land slide and snow clearance facilities</p> <p>Geological details of rock strata in the area in case of tunnels</p>
4.1.1(1)		The Consultant should make an in depth study of available geological and meteorological maps of the area.
4.1.1 (2)		<p>The primary tasks to be accomplished during the reconnaissance survey shall also include:</p> <p>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.</p> <p>Climatic conditions i.e. temperature, rain fall data, snow fall data, fog conditions, unusual weather conditions etc.</p> <p>Realignment requirements including provision of tunnels, if required.</p> <p>Inventory of tunnels and geologically sensitive areas like slip prone areas, areas subject to landslides, rock fall, snow drifts, erosion, avalanche activity etc.</p>
4.1.1.2.1 (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.
4.1.1.3.1 (1)		<p>The inventory data shall also include:</p> <p>General elevation of road indicating maximum & minimum heights negotiated by main ascents & descents and total no. of ascents & descents.</p> <p>Details of road gradients, lengths of gentle & steep slopes, lengths & location of stretches in unstable areas, areas with cliffs, areas with loose rocks, land slide prone areas, snow drift prone areas, no. & location of hairpin bends etc.</p> <p>Details of tunnels</p> <p>Details & types of protective structures, erosion & land slide control/protection measures, snow drift control measures, avalanche protection/control measures etc.</p>
4.1.1.3.2 (2)		<p>Pavement:</p> <p>Location of crust failures along with their causes</p> <p>Conditions of camber/cross falls/super elevations etc., whether affected by subsidence</p> <p>Embankment:</p> <p>Extent of slope erosion on hill and valley side</p>

Condition Surveys & Investigation for Slope Stabilization, Erosion Control, Landslide Correction/Protection & Avalanche Protection

		<p>Measures:</p> <p>Inventory & Condition Surveys of Existing Protective/Control Measures:</p> <p>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.</p> <p>b) Landslide Investigation</p> <p>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 instability and to determine appropriate control measures needed to prevent or minimize recurring of instability problems.</p> <p>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.</p>
13.	4.11.4.4	<p>a) For tunnels if required, geotechnical and subsurface investigation shall be done as per IRC:SP:91.</p> <p>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.</p>
14.	4.12.1 (1)	<p>The Consultant shall also carry out detailed designs and prepare working designs for the following:</p> <p>a) cross sections at every 25 m intervals</p> <p>b) Slope stabilization and erosion control measures</p> <p>c) Design of protection/control structures in areas subject to subsidence, landslides, rock fall, rock slide, snow drifts, icing, scour, avalanche activity etc.</p> <p>d) Design of protective structures in slip prone and unstable areas</p> <p>e) Design of scenic overlooks, watering points etc.</p> <p>f) Safety features specific to hill roads</p>
15.	4.12.2 (1)	<p>The Consultant shall evolve Design Standards and material specifications</p>

	4.12.2 (2)	for the Study primarily based on IRC publications, MORT&H Circulars and relevant recommendations of the international standards for hill roads for approval by MORT&H /RCD Bihar. 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 hill regions 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.
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.	--	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.	4.12.3 (1)	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.	10.6 (1)	<p>Volume II: Design Report :</p> <p>a) Inventory of protection measures and other structures</p> <p>b) Inventory of tunnels, if required.</p> <p>c) Proposed preliminary designs for tunnels, if required.</p> <p>Volume III: Drawings</p> <p>a) Drawings for protection/control measures and other structures</p> <p>b) Drawings for tunnels, if required.</p>
24.	10.7 (3)	<p>Volume II: Design Report (Part II)</p> <p>Part II of Design Report shall also deal with design of tunnels, if required and design of other protection/control structures.</p> <p>Volume IX: Drawing Volume</p> <p>This shall also include :</p> <p>a) Detailed working drawings for tunnels, if required.</p> <p>b) Detailed working drawings for protection/control structures</p>

SUPPLEMENT II

S.No.	Clause No. of TOR	<i>Additional points</i>
1	4.1	For stand alone 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)	<p align="center">Model Studies for Bridges</p> <p>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.</p> <p>2. Methodology</p> <p>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</p> <p>3. Scope of Work</p> <p>3.1 Physical Model study Physical modeling with appropriate model scale for Hydraulic and Hydrologic Investigations to :</p> <ul style="list-style-type: none"> 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

		<p>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</p> <p>Mathematical Model study</p> <p>Mathematical modeling for detailed Hydraulic / Hydrologic investigations regarding the proposed new bridge to:</p> <ul style="list-style-type: none"> 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. <p>4. Information /Documents /Data required for Physical /Mathematical Model study</p> <ul style="list-style-type: none"> 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
--	--	--

		<p>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.</p> <ul style="list-style-type: none">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 nonflow section respectively. The abrupt variations in the bed levels to be captured by taking measurements at closer locations both in longitudinal as well as lateral directions.vi) The cross sections, as far 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 flood of the river for at least 15 years period.
--	--	---

**S
U
ADDITIONAL REQUIREMENT FOR SAFETY AUDIT**

SUPPLEMENT-III

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

The audit team should review the proposed design from a road safety perspective and check the following aspects

CONTENTS	ITEMS
Aspects to be checked	<ul style="list-style-type: none"> 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
A1 : General	<ul style="list-style-type: none"> ➤ Departures from standards ➤ Cross-sectional variation ➤ Drainage ➤ Climatic conditions ➤ Landscaping ➤ Services apparatus ➤ Lay-byes ➤ Footpath ➤ Pedestrian crossings ➤ Access (minimize number of private accesses)

	<ul style="list-style-type: none"> ➤ Emergency vehicles ➤ Public Transport ➤ Future widening ➤ Staging of contracts ➤ Adjacent development
A2 : Local Alignment	<ul style="list-style-type: none"> ➤ Visibility ➤ New/Existing road interface ➤ Safety Aids on steep hills
A3 : Junctions	<ul style="list-style-type: none"> ➤ Minimise potential conflicts ➤ Layout ➤ Visibility
A4 : Non-Motorised road users Provision	<ul style="list-style-type: none"> ➤ Adjacent land ➤ Pedestrians ➤ Cyclists ➤ Non-motorised vehicles
A5 : Signs and Lighting	<ul style="list-style-type: none"> ➤ Lighting ➤ Signs/Markings
A6 : Construction and Operation	<ul style="list-style-type: none"> ➤ Buildability ➤ Operational ➤ 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	<p>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.</p> <p>B. Width options considered for various sections.</p> <p>C. Departures from standards and action taken.</p> <p>D. Provision of pedestrians, cyclists and intermediate transport</p>

	E. Safety implications of the scheme beyond its physical limits i.e. how the scheme fits into its environs and road hierarchy
B1 : General	<ul style="list-style-type: none"> ➤ Departures from standards ➤ Cross-sectional variation ➤ Drainage ➤ Climatic conditions ➤ Landscaping ➤ Services apparatus ➤ Lay-byes ➤ Footpaths ➤ Pedestrian crossings ➤ Access (minimize number of private accesses) ➤ Emergency vehicles ➤ Public Transport ➤ Future widening ➤ Staging of contracts ➤ Adjacent development
B2 : Local Alignment	<ul style="list-style-type: none"> ➤ Visibility ➤ New/Existing road interface ➤ Safety Aids on steep hills
B3 : Junctions	<ul style="list-style-type: none"> ➤ Minimise potential conflicts ➤ Layout ➤ Visibility
B4 : Non-Motorised road users Provision	<ul style="list-style-type: none"> ➤ Adjacent land ➤ Pedestrians ➤ Cyclists ➤ Non-motorised vehicles
B5 : Signs and Lighting	<ul style="list-style-type: none"> ➤ Lighting ➤ Signs/Markings
B6: Construction and Operation	<ul style="list-style-type: none"> ➤ Buildability ➤ Operational ➤ 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	<p>A. Any design changes since Stage 1.</p> <p>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).</p>
C1 : General	<ul style="list-style-type: none"> ➤ Departures from standards ➤ Drainage ➤ Climatic conditions ➤ Landscaping ➤ Services apparatus ➤ Lay-byes ➤ Access ➤ Skid-resistance ➤ Agriculture ➤ Safety Fences ➤ Adjacent development
C2 : Local Alignment	<ul style="list-style-type: none"> ➤ Visibility ➤ New/Existing road interface
C3 : Junctions	<ul style="list-style-type: none"> ➤ Layout ➤ Visibility ➤ Signing ➤ Lighting ➤ Road Marking ➤ T,X,Y-junctions ➤ All roundabouts ➤ Traffic signals
C4 : Non-Motorised road users Provision	<ul style="list-style-type: none"> ➤ Adjacent land ➤ Pedestrians ➤ Cyclists

	<ul style="list-style-type: none"> ➤ Non-motorised vehicles
C5 : Signs and Lighting	<ul style="list-style-type: none"> ➤ Advanced direction signs ➤ Local traffic signs ➤ Variable message signs ➤ Other traffic signs ➤ Lighting
C6 : Construction and Operation	<ul style="list-style-type: none"> ➤ Buildability ➤ Operational ➤ Network Management

Enclosure-I

MANNING SCHEDULE

Consultancy Services for preparation of Feasibility Study and Detailed Project Report for Improvement to Two Lane with Paved shoulder of

(1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727

(2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa Ashram - Prakhand Gawnaha - Indo / Nepal Border

(3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on NH-727

(4) Areraj - Motihari in Bihar on EPC Mode. **DPR/BIHAR/NHD-MOD-PAT/02**

Sl. No	Key Personnel	Total Project Assignment(8 months)		
		At site (mm)	At design office	Total Time Period (mm)
1	Team Leader Cum Senior Highway	3.5	3.5	7
2	Senior Bridge Engineer	1	2	3
3	Highway cum Pavement Engineer	1.5	2	3.5
4	Material-cum-Geo-technical	3	2	5
5	Senior Survey Engineer	3	2	5
6	Traffic and Safety expert	1	2	3.5
7	Environmental Specialist	1	1.5	2.5
8	Quantity Surveyor/ Documentation	1	3.5	4.5
	Total	15	18.5	33.5

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 **MORT&H /RCD Bihar** from time to time.

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

**Qualification and Experience Requirement of Key Personnel
Team Leader cum Senior Highway Engineer**

i)	Educational Qualification	
	Essential	Graduate in Civil Engineering or equivalent
	Desirable	Post graduate in Civil Engineering (highways/structures/traffic and transportation/soil mechanics and foundation engineering/ Construction Management /Transportation)
ii)	Essential Experience	
	a) Total Professional Experience	Min. 20 years
	b) Experience in Highway projects	Min. 15 years in Planning, project preparation and design of Highway projects , including 2/4/6 laning of NH/SH/ expressways. For hill roads, respective hill roads experience is required
	c) Experience in similar capacity (Either as Team Leader or in Similar capacity)	In Feasibility of two / Four/Six Laning works and DPR/IC/ Construction Supervision of Two/Four/six laning of major highway projects(NH/SH/Expressways)/ feasibility cum detailed project report of two/ four laning projects of minimum aggregate length of 80 km. For hill roads, respective hill roads experience is required.
iii)	Age Limit	70 years on the date of submission of proposal

QUALIFICATION AND EXPERIENCE REQUIREMENT OF KEY PERSONNEL*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. 15 years
	b) Experience in Highway projects	Minimum 10 years experience in pavement design and maintenance of highways
	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	70 years on the date of submission of Proposal

QUALIFICATION AND EXPERIENCE REQUIREMENT OF KEY PERSONNEL*Sr 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. 15 years
	b) Experience in Bridge projects	Min. 10 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	70 years on the date of submission of Proposal

QUALIFICATION AND EXPERIENCE REQUIREMENT OF KEY PERSONNEL*Traffic and Safety Expert*

i)	Educational Qualification	
	Essential	Graduate in Civil Engineering
	Desirable	Masters in Traffic Engineering / Transportation Engineering / Transport Planning
ii)	Essential Experience	
	a) Total Professional Experience	Min. 10 years
	b) Experience in Highway projects	Min. 5 years on similar projects.
	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	70 years on the date of submission of Proposal

QUALIFICATION AND EXPERIENCE REQUIREMENT OF KEY PERSONNEL*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. 15 years
	b) Experience in Highway Projects	Min. 8 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	70 years on the date of submission of Proposal

QUALIFICATION AND EXPERIENCE REQUIREMENT OF KEY PERSONNEL*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. 15 years
	b) Experience in Highway projects	Min. 5 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

QUALIFICATION AND EXPERIENCE REQUIREMENT OF KEY PERSONNEL*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. 10 years
	b) Experience in Highway Projects	Min. 5 years in environment impact assessment 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	70 years on the date of submission of proposal

QUALIFICATION AND EXPERIENCE REQUIREMENT OF KEY PERSONNEL

Quantity Surveyor/Documentation Expert

i)	Educational Qualification	
	Essential	Graduate or equivalent in Civil Engineering / Certificate course from 'Institution of Quantity Surveying'
	Desirable	
ii)	Essential Experience	
	a) Total Professional Experience	Min. 15 years
	b) Experience in Highway Projects	Min. 5 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	70 years on the date of submission of proposal

Schedule for submission of Reports and Documents

Stage No.	Activity	No. of copies	Time Period in days from date of commencement
1	Monthly Reports	3	by 10 th day of every month
2	Inception Report (i) Draft Inception Report including QAP document	3	21
	(ii) Inception Report including QAP document	3	30
3	F.S. REPORT i) Draft Feasibility Study Report including option study report	4	75
	ii) Comments of client	1	90
	iii) Final Feasibility Study Report incorporating compliance of comments of Client.	4	105
4	LA & Clearances I Report i) Draft LA & Clearances I Report	4	90
	ii) Comments of client	1	105
	iii) Final LA & Clearances I Report incorporating compliance of comments of Client	4	120

5	Detailed Project Report i) Draft DPR ii) Comments of client iii) Final DPR incorporating compliance of comments of Client	4 1 6	165 195 210
6	Technical Schedules i) Draft Technical Schedules ii) Comments of client iii) Final technical schedule	4 1 6	135 150 165
7	LA & Clearances II Report Approval of Project clearances from concerned agencies e.g. from MOEF; Rly for approval of GAD and detail engineering drawing of ROB/RUB; Irrigation Dept., Land Acquisitions: 3(a), 3(A), 3(D) Notifications	6 Original letters from the concerned agencies and 5 photocopies of each. 3 copies each	240

APPENDIX-II

Proof of Eligibility

Form-E1

Letter of Proposal (On Applicant’s letter head)

(Date and Reference)

To, *****

Sub: Appointment of Consultant for preparation
of Detailed Project Report 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.

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

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

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

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.

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.

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.

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.

I/We certify that in regard to matters other than 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.

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.

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.

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.

The Bid Security of Rs. ***** (Rupees *****) in the form of a Bank Guarantee is attached, in accordance with the RFP document.

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.

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

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

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.

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.

The Proof of Eligibility and Technical proposal are being submitted in separate covers in hard copy and they are being submitted online also. 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.

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)

Form-E2/T3

FIRM'S REFERENCES

Relevant Services Carried out in the Last Seven Years (2008-09 onwards)
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/Association 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/Associate		
Narrative Description of Project :		
Description of Actual Services Provided by your Company:		

Signature of Authorised Representative

(Certificate from Employer regarding experience should be furnished)

APPENDIX-II

Form- E3

Financial Capacity of the Applicant

Name of Applicant:

S.No.	Financial Year	Annual Revenue (Rs/US \$ in million)
1	2015-16	
2	2014-15	
3	2013-14	
4	2012-13	
5	2011-12	

Certificate from the Statutory Auditor^{\$}

This is to certify that -----(name of the Applicant) has received the payments shown above against the respective years on account of Consultancy Services.

Name of the audit firm Seal of

the audit firm Date

(Signature, name and designation of the authorized signatory)

^{\$} In case he Applicant does not have a statutory auditor, it shall provide the certificate from its chartered accountant that ordinarily audits the annual account of the Applicant.

Note:

Please do not attach any printed Annual Financial Statement.

APPENDIX-II

Form- E4

BANK GUARANTEE FORMAT FOR BID SECURITY

(To be stamped in accordance with Stamp Act if any, of the country of issuing bank)

Ref.: **Tender No.** _____, **dated** _____

Bank Guarantee:

Date:

WHEREAS, _____ (Name of Bidder) _____ (hereinafter called "the bidder") has submitted his bid dated _____ (date) for the **Tender No.** _____, dated _____ (hereinafter called "the Bid". KNOW ALL MEN by these presents that We, _____ [Name of Bank] of _____ [Name of Country] having our registered office at _____ (hereinafter called "the Bank") are bound unto _____ [name of employer] (hereinafter called "the Employer") in the sum of Rs. _____ (Rupees _____ Lakhs only) for which payment will and truly to be made to the said employer the bank binds himself, his successors and assigns by these presents. SEALED with the Common Seal of the said Bank this _____ day of _____ 201_.

THE CONDITIONS of this obligation are:

If the Bidder withdraws his Bid during the period of bid validity specified in the Bid document;
or

If the Bidder does not accept the correction of arithmetical errors of his Bid Price in accordance with the Instructions to Bidder; or

If the Bidder having been notified of the acceptance of his Bid by the Employer during the period of bid validity,

a. fails or refuses to execute the Form of Agreement in accordance with the Instructions to Bidders, if required; or

b. fails or refuses to furnish the Performance Security, in accordance with the letter of invitation, we undertake to pay the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of one or any of the conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date 150 (one hundred and fifty) days after the deadline for submission of bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

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 upon us on or before _____ all our liability under this guarantee shall cease

DATE _____

SIGNATURE OF THE BANK _____

SEAL OF THE BANK _____

SIGNATURE OF THE WITNESS _____

Name and Address of the Witness _____

The bank guarantee shall be issued by a bank (Nationalized/Scheduled) located in India

(Form-T1)

TECHNICAL PROPOSAL

FROM:

TO:

_____	_____
_____	_____
_____	_____
_____	_____

Sir:

Subject Consultancy Service for

Regarding Technical Proposal

I/We _____ (name of

Bidder) Consultant/ Consultancy firm herewith enclose Technical Proposal for selection of my/our firm/organization as Consultant for_____.

Yours faithfully,

Signature
Full Name
Designation
Address

(Authorized Representative)

(Form-T-2)

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

Sl.No.	<i>Name of Project</i>	Consultancy Package No.	Names of Proposed Key Personnel
1			
2			
3			
4			

FIRM'S REFERENCES
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/Association 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/Associate		
Narrative Description of Project :		
Description of Actual Services Provided by your Company:		

Signature of Authorised Representative

(Certificate from Employer regarding experience should be furnished)

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.

COMMENTS/ SUGGESTIONS OF CONSULTANT ON THE TERMS OF REFERENCE

1.

2.

3.

4.

5.

....

....

**Composition of the Team Personnel and the task
Which would be assigned to each Team Member**

Technical/Managerial Staff

S.No.	Name	Position	Task Assignment
1.			
2.			
3.			
4.			
....			
....			
....			

Support Staff

S.No.	Name	Position	Task Assignment
1.			
2.			
3.			
4.			
....			
....			
....			

APPROACH PAPER ON METHODOLOGY PROPOSED FOR PERFORMING THE ASSIGNMENT

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

- 1) Composition of the team [not more than 1 page]
 - 2) Methodology for services, surveying, data collection [not more than 2 pages]
and analysis
 - 3) Quality Assurance system for consultancy assignment [not more than 1 page]
-

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

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

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

Facility for Field investigation and Testing

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

- a) Geo-technical investigation Available/ Outsourced/ Not Available
- b) Pavement investigation Available/ Outsourced/ Not Available

In case answer to 1 is Available a list of field investigation and testing equipments available in-house

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

For experience in LiDAR or equivalent technology for topographic survey, GPR and Induction Locator or equivalent 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
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 :
Technology Used:		
Start Date (Month / Year)	Completion Date (Month / Year)	Approx. Value of Services : (in INR/current USD) :
Name of JV/Association 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/Associate		
Narrative Description of Project :		
Description of Actual Services Provided by your Company:		

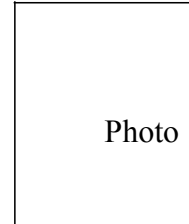
Signature of Authorised Representative

(Certificate from Employer regarding experience should be furnished)

Office Equipment and software

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

Form- T11



Format of Curriculum Vitae (CV) For Proposed Key Staff

1. Proposed Position:

2. Name of Staff:

3. Date of Birth: **(Please furnish proof of age)**

4. Nationality:

5. Educational Qualification:

*(Summarize college/university and other specialized education of staff member, giving names of schools, dates attended and degrees obtained). **(Please furnish proof of qualification)***

Contact Address with Phone and mobile numbers:

6. Membership of Professional Societies:

7. Publication:

(List of details of major technical reports/papers published in recognized national and international journals)

8. Employment Record:

*(Starting with present position, list in reversed order, every employment held. List all positions held by staff member since graduation, giving dates, names of employing organization, title of positions held and location of assignments. For experience **period of specific assignment must be clearly mentioned**, also give client references, where appropriate).*

9. Summary of the CV

(Furnish a summary of the above CV. The information in the summary shall be precise and accurate. The information in the summary will have bearing on the evaluation of the CV).

A) Education:

- i) Field of graduation and year
- ii) Field of post-graduation and year
- iii) Any other specific qualification

B) Experience

- i) Total experience in highways: ___ Yrs.
- ii) Responsibilities held: a) ___ Yrs.
 - 1. ___ Yrs.
 - 2. ___ Yrs.
- iii) Relevant experience: ___ Yrs.

C) Permanent Employment with the firm:

___ Yrs. If yes, how many years:

If no, what is the employment:

Arrangement with the firm?

Certification:

I am willing to work on the project and I will be available for entire duration of the project assignment and I will not engage myself in any other assignment during the currency of this assignment on the project

I, the undersigned, certify that to the best of my knowledge and belief, this biodata correctly describes myself my qualification and my experience.

Signature of the Candidate _____

Place _____

Date _____

Signature of the Authorized Representative of the firm _____

Place _____

Date _____

Note: Each page of the CV shall be signed in ink by both the staff member and the Authorized representative of the firm. Photocopies will not be considered for evaluation.

UNDERTAKING FROM THE PROFESSIONAL

I, (Name and Address) have not left any assignment with the consultants engaged by MORT&H/ contracting firm (firm to be supervised now) for any continuing works of MORT&H 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 completion of the work, I may be debarred for an appropriate period to be decided by **MORT&H /RCD Bihar** I have also no objection if my services are extended by **MORT&H /RCD Bihar** for this work in future.

UNDERTAKING FROM CONSULTING FIRM

The undersigned on behalf of (name of consulting firm) certify that Shri.....(name of the proposed personnel and address) to the best of our knowledge has not left his assignment with any other consulting firm engaged by MORT&H / contracting firm (firm to be supervised now) for the ongoing projects. We understand that if the information about leaving the past assignment with **MORT&H /NHAI/IAHE/NHIDCL/State PWD** without completing his assignment is known to **MORT&H /RCD Bihar**, **MORT&H /RCD Bihar** would be at liberty to remove the personnel from the present assignment and debar him for an appropriate period to be decided by **MORT&H /RCD Bihar**

(Form-I)

FINANCIAL PROPOSALS

FROM:

TO:

Sir:

Subject: Consultants' Services for

Regarding Price Proposal

I/We Consultant/consultancy firm herewith enclose *Price Proposal for selection of my/our
firm/organization as Consultant for _____

Yours faithfully,

Signature_____

Full Name_____

Designation_____

Address_____

(Authorized Representative)

***The Financial proposal is to be filled strictly as per the format given in RFP.**

Format of Financial Proposal
Summary of Cost in Local Currency

No.	Description	Amount (LC)* (INR)
I	<u>Local Consultants</u> Remuneration for Local Staff (inclusive of per diem allowance)	
II	Support Staff (inclusive of per diem allowance)	
III	Per diem allowance of expatriate personnel	
IV	Transportation	
V	Duty Travel to Site	
VI	Office Rent	
VII	Office Supplies, Utilities and Communication	
VIII	Office Furniture and Equipment (Rental)	
IX	Reports and Document Printing	
X	Surveys & Investigations	
A	Topographical Survey	
B	Investigations	
	Subtotal Local Consultants :	
	<u>Foreign Consultants</u>	
F-I	Remuneration for Expatriate Staff	
F-II	Mobilization and Demobilization	
	Total Cost Net of Tax :	
Taxes and Duties	I. Income Tax (Expatriate) II. Import duties III. Value added tax	
	Total cost net of service tax**	
	Service Tax	
	TOTAL COSTS (Including Service Tax)	

LC* Local Currency

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

Note: No escalation will be payable during the services

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

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

I(a) **Consultancy Services for preparation of Feasibility Study and Detailed Project Report for Improvement to Two Lane with Paved shoulder of**

(1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727

(2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa Ashram - Prakhanda Gawnaha - Indo / Nepal Border

(3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on NH-727

(4) Areraj - Motihari in Bihar on EPC Mode. **DPR/BIHAR/NHD-MOD-PAT/02**

S.No.	Position	Name	Rate (INR)	SM	Amt.(INR)
	Professional Staff				
1	Team Leader cum Senior Highway Engineer			7	
2	Senior Bridge Engineer			3	
3	Highway cum Pavement Engineer			3.5	
4	Material-cum-Geotechnical Engineer- Geologist			5	
5	Senior Survey Engineer			5	
6	Traffic and Safety Expert			3.5	
7	Environmental Specialist			2.5	
8	Quantity Surveyor/ Documentation Expert			4.5	
	Sub-Total:				
	Sub-Professional Staff	(To be assessed by Consultant as per requirement of assignment)			
1					
2					
3					
4					
5					
6					
7					
	Sub-Total:				
	TOTAL				

--	--	--	--	--	--

II.Support Staff

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

Transportation (Fixed costs)

S.No	Description	Qty.	Nos. of months	Rate/ Month (INR)	Amount (INR)
1	The vehicles provided by the Consultants 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)

Trips	NO	Rate (INR)	Amount (INR)

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	Office Supplies Drafting			
2	Supplies Computer			
3	Running Costs			
4	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. of Copies	Rate per Copy (INR.)	Amount (INR.)
1	Monthly Report	3 Per Month		
2	Inception Report & QAP	3		
3	Environment and Social Impact Screening 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 equivalent technology			

B. Investigation (Fixed cost)

No.	Description	Quantity	Amount (INR)
1	Road and Bridge Inventory		
2	BBD 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.
	a) Boring in all type of soils (other than hard rock)		1500m (for projects of length < 110 km) or 2000m (for projects of length > 110 km)
	b) Boring in hard rock		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.

(Form-IV)

Estimate of Costs for Expatriate Consultants (in Indian Rupees)

I. Remuneration of Expatriate Staff including per diem allowances

No.	Positions	Name	Rate ()	SM	Amount ()
			Total :		

II. Mobilization and Demobilization

1. International Airfares (Fixed costs)

Position	Round Trips	Rate	Amount
		Total	

2. Inland 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)

S. No	Stretch Proposed for DPR	NH No.	Approximate Length (in Km.)	Package No.	State	Cumulative Tentative Quantities (in m)	
						In Soils other than hardrock	In hard rock
1	<p>For projects of length < 110 km preparation of Feasibility Study and Detailed Project Report for Improvement to Two Lane with Paved shoulder of</p> <p>(1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727</p> <p>(2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa Ashram - Prakhand Gawnaha - Indo / Nepal Border</p> <p>(3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on NH-727</p> <p>(4) Areraj - Motihari in Bihar on EPC</p> <p>Mode. DPR/BIHAR/NHD-MOD-PAT/02</p>	As per Listat Annex-1	As per Listat Annex-1	As per Listat Annex-1	As per Listat Annex-1	1500	200
2	<p>For projects of length > 110 km - <Details of packages></p>	As per Listat Annex-1	As per Listat Annex-1	As per Listat Annex-1	As per Listat Annex-1	2000	300

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 3 (Three) Nos. of criteria.

(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 2008-09 onwards)

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

(c) Annual Average Turn Over for the last 3 years {In cases where, Audited/Certified copy of Balance Sheet for the FY 2014-15 is available, last three years shall be counted from 2012-13 to 2014-15. However, where audited/certified copy of the Balance Sheet for the FY 2014-15 is not available (as certified by the Statutory auditor) then in such cases last three years shall be considered from 2011-12 to 2013-14} of the firm from Consultancy services should be equal to more than Rs 5 crore.

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/Associate 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 2008-09 onwards

S. No.	Package No.	Minimum Aggregate Length required of DPR/ Feasibility km)		Minimum length of a Eligible Project (4/ 6 lane)			
		Lead in JV	Other Partner in JV	DPR		Feasibility	
		Lead in JV	Other Partner in JV	Lead in JV	Other Partner in JV	Lead in JV	Other Partner in JV

c) Minimum Annual Average Turn Over for the last 5 years {In cases where, Audited/Certified copy of Balance Sheet for the FY 2014-15 is available, last five years shall be counted from 2010-11 to 2014-15. However, where audited/certified copy of the Balance Sheet for the FY 2014-15 is not available (as certified by the Statutory auditor) then in such cases last five years shall be considered from 201-11 to 2013-14} of a firm applying as Lead Partner/Other Partner in case of JV from Consultancy services should be as given below:

No.	Mode of Submission by a firm	Annual Average Turn Over for the last 5 years
1	Lead Partner in a JV	Rs 3.75 crore
2	Other Lead partner in a JV	Rs 2.50 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 carrying out 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

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

2.1 Firm's Relevant Experience

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

S.No	Description	Maximum Points	Sub-Points
1	Specific experience of the DPR consultancy related to the assignment for eligibility	15	
1.1	Aggregate Length of DPR / Feasibility study of 2/4/ 6 lane projects	7.5	
1.1.1	More than the indicative Length of the package applied for		5.5
1.1.2	More than 2 times the indicative length of the package		6.5

S.No	Description	Maximum Points	Sub-Points
	applied for		
1.1.3	More than 3 times the indicative length of the package applied for		7.5
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)	7.5	
1.2.1	1 project		5.5
1.2.2	2 projects		6.5
1.2.3	3 or more projects		7.5
2	DPR of Bridge having length more than 200 m	5	
2.1	1 bridge		2
2.2	2 bridges		3
2.3	3 bridges		4
2.4	4 or more bridges		5
3	Specific experience of firms in terms of turnover	5	
3.1	Firm's Average Turnover of last 5 years \geq 10 crore		5
3.2	Firm Average Turnover of last 5 years \geq 5 crore but $<$ 10 crore		4
3.3	Firm Average Turnover of last 5 years $<$ 5 crore		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 Points	Sub-Points
1	Specific experience of the DPR consultancy related to the assignment for eligibility	12	
1.1	Aggregate Length of DPR / Feasibility study of 2/4/6 lane projects	6	
1.1.1	More than the indicative Length of the package applied for		4
1.1.2	More than 2 times the indicative length of the package applied for		5
1.1.3	More than 3 times the indicative length of the package applied for		6
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)	6	
1.2.1	1 project		4
1.2.2	2 projects		5
1.2.3	3 or more projects		6
2	DPR of Bridge having length more than 200 m	4	
2.1	1 bridge		1
2.2	2 bridges		2
2.3	3 bridges		3
2.4	4 or more bridges		4
3	Specific experience of firms in terms of turnover	4	

S.No	Description	Maximum Points	Sub-Points
3.1	Firm's Average Turnover of last 5 years \geq 10 crore		4
3.2	Firm Average Turnover of last 5 years \geq 5 crore but $<$ 10 crore		3
3.3	Firm Average Turnover of last 5 years $<$ 5 crore		0
4	DPR for special category projects (Special bridges/ tunnels or expressways, whichever applicable). It is to be noted that either 4.1 or 4.2 shall be applicable, and not both.	5	
4.1	DPR of number of special bridges/ tunnels (if applicable)	5	
4.1.1	1 project		1
4.1.2	2 projects		2
4.1.3	3 projects		3
4.1.4	4 projects		4
4.1.5	5 or more projects		5
4.2	Aggregate length of DPR/ Feasibility study for expressways	5	
4.2.1	Upto 50km		2
4.2.2	50km to 100km		3
4.2.3	100km to 150km		4
4.2.4	More than 150 km		5

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)

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 carrying out 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.

2.2 Adequacy of the proposed work plan and methodology in responding to the TOR

S. No.	Description	Max points
(i)	Site Appreciation	2
(ii)	Comments on TOR	1
(iii)	Team Composition and Task assignment	1
(iv)	Methodology	1
	Total Points	5
	Rating given below shall be applicable on all above	
	Below Average(50 %) Average (100%)	(75%) Good (90%) Excellent

2.3 Material testing, Survey and investigation equipment and software proposed to be used

S.No	Description	Maximum Points	Sub-Points
1	Availability of in-house material testing facility	2	
1.1	Available		2
1.2	Outsourced		1
1.3	Not Available		0
2	Field Investigation Facilities	3	
2.1	Available		3
2.2	Outsourced		1.5
2.3	Not Available		0
3	Office Equipment and Software	3	
3.1	Available		3
3.2	Outsourced		1.5
3.3	Not Available		0
4	Experience in LiDAR or equivalent technology for topographic survey	4	
4.1	1 project		1
4.2	2 projects		2
4.3	3 projects		3
4.4	4 or more projects		4
5	Experience in using GPR and Induction Locator or equivalent technologies for detection of sub-surface utilities	4	

S.No	Description	Maximum Points	Sub-Points
5.1	1 project		1
5.2	2 projects		2
5.3	3 projects		3
5.4	4 or more projects		4
6	Experience in digitization of cadastral maps for land acquisition	4	
6.1	1 project		1
6.2	2 projects		2
6.3	3 projects		3
6.4	4 or more projects		4

2.4 Qualification and Competence of the Key Staff for adequacy of the Assignment. (Para 12.2 of Data Sheet and Enclosure II of TOR)

2.4.1 TEAM LEADER cum SENIOR HIGHWAY ENGINEER

S. No.	Description	Max. Points
I	General Qualification	25
i)	Degree in Civil Engineering or equivalent	20
ii)	Post Graduation in Highway Engg./Structures/Traffic and Transportation/Soil Mechanics and Foundation Engineering/Construction Management/Transportation	5
II	Relevant Experience & Adequacy for the Project	65
a)	Total Professional Experience	14
	<20 years	0
	20-25 years	11
	>25-28 years	13
	>28 years	14
(b)	Experience in Highway Projects- Experience in Planning, project preparation and design of Highway Projects (2/4/6 laning of NH/SH/Expressways)	23
	<15 years	0
	15-20 years	17
	>20 -25 years	21
	>25 years	23
c)	Experience in Similar Capacity	28
(i)	In Feasibility of 2/4/6 laning works or DPR/IC/Construction Supervision of major highway projects i.e. 2/4/6 laning of NH/SH/Expressways in Similar Capacity (Minimum Aggregate length of 80 km)	19
	< 80km	0
	80 km-150km	14
	> 150km-250km	17
	> 250km	19
(ii)	In Feasibility of 2/4/6 laning works or DPR/IC/Construction Supervision of major highway projects i.e. 2/4/6 laning of NH/SH/Expressways in Similar Capacity- Number of Projects	9
	2 projects	7
	3- 5 projects	8
	More than 5 projects	9
III	Employment with Firm	10
	Less than 1 Year	0
	1-2 years	5
	more than 2 years	10
	Total	100

2.4.2 HIGHWAY cum PAVEMENT ENGINEER

S. No.	Description		Max. Points
I	General Qualification		25
i)	Degree in Civil Engineering or equivalent		20
ii)	Post graduation in Highway Engg/ Transportation Engineering		5
II	Relevant Experience & Adequacy for the Project		65
a)	Total Professional Experience		14
	<15 years	0	
	15-20 years	11	
	>20 -25years	13	
	>25 years	14	
(b)	Experience in Highway Projects - Experience in Design/ Pavement Design of Highway Projects (2/4/6 laning of NH/SH/Expressways)		23
	<10 years	0	
	10-15 years	17	
	>15-20 years	21	
	>20years	23	
c)	Experience in Similar Capacity		28
(i)	In Design/ Pavement Design of Highway Projects (2/4/6 laning of NH/SH/Expressways) in Similar Capacity (Minimum aggregate length 80 km)		19
	<80km	0	
	80km-150km	14	
	>150km-250km	17	
	>250km	19	
(ii)	In Design/ Pavement Design of Highway Projects (2/4/6 laning of NH/SH/Expressways) in Similar Capacity – Number of Projects		9
	2 projects	7	
	3- 5 projects	8	
	More than 5 projects	9	
III	Employment with Firm		10
	Less than 1 Year	0	
	1-2 years	5	
	more than 2 years	10	
	Total		100

2.4.3 SENIOR BRIDGE ENGINEER

S. No.	Description		Max. Points
I	General Qualification		25
	i)	Degree in Civil Engineering or equivalent	20
	ii)	Post Graduation in Structural Engineering/ Bridge Engineering	5
II	Relevant Experience & Adequacy for the Project		65
	a)	Total Professional Experience	14
		<15 years	0
		15-20 years	11
		>20 -25years	13
		>25years	14
	b)	Experience in Bridge Projects	23
	(i)	Experience in project preparation and design of bridge projects	18
		<10 years	0
		10-15 years	13
		>15 -20years	16
		>20years	18
	(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)	28
		<2 numbers	0
		2-4 numbers	22
		5-6 numbers	25
		> 6 numbers	28
III	Employment with Firm		10
		Less than 1 Year	0
		1-2 years	5
		more than 2 years	10
	Total		100

2.4.4 TRAFFIC AND SAFETY EXPERT

S. No.	Description	Max. Points
I	General Qualification	25
	i) Degree in Civil Engineering	20
	ii) Post graduation in Traffic Engineering /Transportation Engineering / Transportation Planning	5
II	Relevant Experience & Adequacy for the Project	65
	a) Total Professional Experience	14
	<10 years	0
	10-15 years	11
	>15-20 years	13
	>20years	14
	b) Experience in Highway Projects – Experience on Similar Projects (2/4/6 laning of NH/SH/ Expressways)	23
	<5 years	0
	5-7 years	17
	>7-10 years	21
	>10years	23
	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)	28
	<80km	0
	80km-150km	22
	>150km -250km	25
	>250km	28
III	Employment with Firm	10
	Less than 1 Year	0
	1-2 years	5
	more than 2 years	10
	Total	100

2.4.5

MATERIAL ENGINEER cum GEOTECHNICAL ENGINEER cum GEOLOGIST

S. No.	Description	Max. Points
I	General Qualification	25
i)	Degree in Civil Engineering /M. Sc. in Geology	20
ii)	Post graduation in Foundation Engineering / Soil Mechanics / Geo Tech Engineering or Phd in Geology	5
II	Relevant Experience & Adequacy for the Project	65
a)	Total Professional Experience	14
	<15 years	0
	15-20 years	11
	>20-25 years	13
	>25 years	14
b)	Experience in Highway Projects – In Similar Projects (2/4/6 laning of NH/SH/Expressways) in design and or Construction/ Construction Supervision	23
	<8 years	0
	8-10 years	17
	>10 -12 years	21
	>12years	23
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)	28
	<80km	0
	80km-150km	22
	>150km – 250km	25
	>250km	28
III	Employment with Firm	10
	Less than 1 Year	0
	1-2 years	5
	more than 2 years	10
	Total	100

2.4.6 SENIOR SURVEY ENGINEER

S. No.	Description	Max. Points
I	General Qualification	25
i)	Degree or equivalent in Civil Engineering / Diploma in Civil Engineering / Diploma in Surveying	20
ii)	Post Graduation in Survey Engineering / Surveying / Remote Sensing	5
II	Relevant Experience & Adequacy for the Project	65
a)	Total Professional Experience	14
	>15 years	0
	15-20 years	11
	>20-25 years	13
	>25 years	14
b)	Experience in Highway Projects	23
i)	Experience in Similar Projects (2/4/6 laning of NH/SH/Expressways) in project preparation/ Construction / Construction Supervision	18
	<5years	0
	5 -7 years	13
	>7-10 years	16
	>10 years	18
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 of to 80km)	28
	>80km	0
	80km-150km	22
	>150km-250km	25
	>250km	28
III	Employment with Firm	10
	Less than 1 Year	0
	1-2 years	5
	more than 2 years	10
	Total	100

2.4.7 ENVIRONMENTAL SPECIALIST

S. No.	Description	Max. Points
I	General Qualification	25
i)	Degree in Civil Engineering / Environmental Engineering or Post Graduate in Environmental Sciences	20
ii)	Post Graduation in Environmental Engineering	5
II	Relevant Experience & Adequacy for the Project	65
a)	Total Professional Experience	14
	<10 years	0
	10-15 years	11
	>15-20 years	13
	>20 years	14
b)	Experience in Highway Projects- Experience in Environment impact assessment of Highway Projects (2/4/6 laning of NH/SH/Expressways)	23
	<5 years	0
	5 -7 years	17
	>7-10 years	21
	>10 years	23
c)	Experience as Environmental Specialist or in Similar Capacity in Highway Projects(2/4/6 laning of NH/SH/Expressways)	28
	<2 projects	0
	2- 4 projects	22
	5-7 projects	25
	>7 projects	28
III	Employment with Firm	10
	Less than 1 Year	0
	1-2 years	5
	more than 2 years	10
	Total	100

2.4.8

QUANTITY SURVEYOR/DOCUMENTATION EXPERT

S. No.	Description		Max. Points
I	General Qualification		25
	i) Graduation or equivalent in Civil Engineering / Certificate course from 'Institution of Quantity Surveying'		20
	ii) Graduation or equivalent in Civil Engineering		5
II	Relevant Experience & Adequacy for the Project		65
	a) Total Professional Experience		14
	<15 years	0	
	15-20 years	11	
	>20-25 years	13	
	>25 years	14	
	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)		23
	>5 years	0	
	5 -7 years	17	
	>7-10 years	21	
	>10 years	23	
	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)		28
	>80km	0	
	80km-150km	22	
	>150km – 250km	25	
	>250km	28	
III	Employment with Firm		10
	Less than 1 Year	0	
	1-2 years	5	
	more than 2 years	10	
	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/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
- iii) On behalf of Contractor: Material Engineer/Material Expert/Geo Technical Engineer/Manager (Material)

5. Traffic and Safety Expert

i) On behalf of Consultant:
Safety

Traffic Engineer/Transportation Engineer/Road
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/ Environmental
Specialist/ Environmental Expert Officers

ii) In Government Organisation:

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)

**DRAFT CONTRACT
AGREEMENT**

Between

**Ministry of Road Transport &
Highways**

Government of India

**Through Chief Engineer (N.H Wing), Road Construction Department,
Govt. Of Bihar, Patna.**

and

M/sin

M/s.....

in Association with M/s.....

For

**preparation of Feasibility Study and Detailed Project Report for Improvement to
Two Lane with Paved shoulder of
(1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727
(2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa
Ashram - Prakhand Gawnaha - Indo / Nepal Border
(3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on
NH-727
(4) Areraj - Motihari in Bihar on EPC Mode. **DPR/BIHAR/NHD-MOD-PAT/02****

(From km _____ to km _____ of NH in the State of ...)

CONTENTS

Sl. No.	Description	Page No.
---------	-------------	----------

I. CONTRACT FORCONSULTANT’S SERVICES

II. GENERAL CONDITIONS OF CONTRACT

1. General Provisions

- | | |
|------|-------------------------------|
| 1.1 | Definitions |
| 1.2 | Relation between the Parties |
| 1.3 | Law Governing the Contract |
| 1.4 | Language |
| 1.5 | Headings |
| 1.6 | Notices |
| 1.7 | Location |
| 1.8 | Authority of Member in Charge |
| 1.9 | Authorized Representatives |
| 1.10 | Taxes and Duties |

2 Commencement, Completion, Modification and Termination of Contract

- | | |
|-------|---|
| 2.1 | Effectiveness of Contract |
| 2.2 | Termination of Contract for Failure to Become Effective |
| 2.3 | Commencement of Services |
| 2.4 | Expiration of Contract |
| 2.5 | Entire Agreement |
| 2.6 | Modification |
| 2.7 | Force Majeure |
| 2.7.1 | Definition |
| 2.7.2 | No Breach of Contract |
| 2.7.3 | Measures to be Taken |
| 2.7.4 | Extension of Time |
| 2.7.5 | Payments |
| 2.7.6 | Consultation |
| 2.8 | Suspension |
| 2.9 | Termination |
| 2.9.1 | By the Client |
| 2.9.2 | By the Consultants |
| 2.9.3 | Cessation of Rights and Obligations |
| 2.9.4 | Cessation of Services |
| 2.9.5 | Payment upon Termination |
| 2.9.6 | Disputes about Events of Termination |

3. Obligations of the Consultants

- | | |
|-----|---------|
| 3.1 | General |
|-----|---------|

3.1.1
3.1.2

Standard of Performance
Law Governing Services3.2 Conflict of Interests

- 3.2.1 Consultants not to Benefit from Commissions, discounts etc.
- 3.2.2 Consultants and Affiliates not to be otherwise interested in Project
- 3.2.3 Prohibition of Conflicting Activities
- 3.3 Confidentiality
- 3.4 Liability of the Consultants
- 3.5 Insurance to be taken out by the Consultants
- 3.6 Accounting, Inspection and Auditing
- 3.7 Consultants' Actions requiring Client's prior Approval
- 3.8 Reporting Obligations
- 3.9 Documents prepared by the Consultants to be the Property of the Client
- 3.10 Equipment and Materials furnished by the Client

4. Consultants' Personnel

- 4.1. General
 - 4.1 Description of Personnel
 - 4.2 Approval of Personnel
 - 4.3 Working Hours, Overtime, Leave etc.
 - 4.4 Removal and/or Replacement of Personnel
 - 4.5 Resident Project Manager

5. Obligations of the Client

- 5.1 Assistance and Exemptions
- 5.2 Access to Land
- 5.3 Change in the Applicable Law
- 5.4 Services, Facilities and Property of the Client
- 5.5 Payment

6. Payment to the Consultants

- 6.1 Cost Estimates; Ceiling Amount
- 6.2 Currency of Payment
- 6.3 Mode of Billing and Payment

7. Responsibility for accuracy of the project document

- 7.1 General
- 7.2 Retention money
- 7.3 Penalty
- 7.4 Action for deficiency in services

8. Fairness and Good Faith

- 8.1 Good Faith
- 8.2 Operation of the Contract

9. SETTLEMENT OF DISPUTES

- 9.1 Amicable Settlement
- 9.2 Dispute Settlement

III. SPECIAL CONDITIONS OF CONTRACT

IV. APPENDICES

- Appendix A: Terms of reference containing, inter-alia, the Description of the Services and Reporting Requirements
- 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 C: Hours of work for Consultants' Personnel
- Appendix D: Duties of the Client
- Appendix E: Cost Estimate
- Appendix F: Minutes of Financial/ Contract Negotiations with the Consultant
- Appendix G: Copy of letter of invitation
- Appendix H: Copy of letter of acceptance
- Appendix I(1): Format for Bank Guarantee for Performance Security for individual work
- Appendix I(2): Format for Bank Guarantee for Performance Security for a number of works
- Appendix J : Minutes of the Pre-bid meeting

DRAFT CONTRACT FOR CONSULTANT’S SERVICES

INDIA

CONTRACT FOR CONSULTANTS' SERVICES

Consultancy Services for preparation of Feasibility Study and Detailed Project

Report for Improvement to Two Lane with Paved shoulder of

(1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727

(2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa Ashram - Prakhand Gawnaha - Indo / Nepal Border

(3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on NH-727

(4) Areraj - Motihari in Bihar on EPC Mode. **DPR/BIHAR/NHD-MOD-PAT/02**

(From km _____ to km _____ Of NH.. in the State of)

This CONTRACT (hereinafter called the "Contract") is made on the ____ day of the
-----2015 , between, on the one hand,

**Ministry of Road Transport & Highways
Government of India Through Chief
Engineer, (N.H Wing), Road Construction**

month of **Department, Govt. Of Bihar, Patna** (hereinafter called the "Client")
and,

on the other hand, M/s _____ in JV with _____

and in Association with _____
(hereinafter called the "Consultants").

WHEREAS

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");

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 and conditions 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:
 - b. The General Conditions of Contract (hereinafter called "GC");
 - c. The Special Conditions of contract (hereinafter called "SC");
 - d. The following Appendices:

Appendix A: Terms of reference containing, inter-alia, the Description of the Services and Reporting Requirements

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 C: Hours of work for Consultants' Personnel

Appendix D: Duties of the Client

Appendix E: Cost Estimate

Appendix F: Minutes of Financial/ Contract Negotiations with the Consultant

Appendix G: Copy of letter of invitation

Appendix H: Copy of letter of acceptance

Appendix I: Copy of Bank Guarantee for Performance Security

Appendix-J: Minutes of the pre-bid meeting

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

**Ministry of Road
Transport & Highways,
Government of India**

Witness

By
Authorized Representative

1. Signature
Name
Address

2. Signature
Name
Address

FOR AND ON BEHALF OF
(Consultant)

Witness

By

1. Signature
Name
Address

Authorised Representative

2. Signature
Name
Address

GENERAL CONDITIONS OF CONTRACT

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 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 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) “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;
- (i) “Personnel” means persons hired by the Consultants or by any Sub consultant 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 India; and “local Personnel” means such persons who at the time of being so hired had their domicile inside India;
- (j) “Party” means the Client or the Consultants, as the case may be, and Parties means both of them;
- (k) “Services” means the work to be performed by the Consultants pursuant to this Contract for the purposes of the Project, as described in Appendix A hereto;
- (l) “SC” means the Special Conditions of Contract by which these General Conditions of Contract may be amended or supplemented;

- (m) “Sub consultant” means any entity to which the Consultants subcontract any part of the Services in accordance with the provisions of Clause GC 3.7; and
- (n) “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 hereunder.

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 atshall 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-I)** 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 shall pay all such taxes, duties, fees and other impositions as may be levied under the Applicable Law.

2 COMMENCEMENT, COMPLETION, MODIFICATION AND TERMINATION OF CONTRACT

2.1 Effectiveness of Contract

This Contract shall come into force and effect on the 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. Pursuant to Clause GC 7.2 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 Sub consultants 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 insofar as such inability arises from an event of Force Majeure, 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 Majeure shall notify the other Party of such event 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 (f) of this Clause 2.9.1, terminate this Contract:

- (a) if the Consultants fail to remedy a failure in the performance of their obligations are under, as specified in a notice of suspension pursuant to Clause 2.8 hereinabove, 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 any agreements 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.

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 2.2 or 2.9 hereof, or upon expiration of this Contract pursuant to Clause 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 3.3 hereof, (iii) the Consultant's obligation to permit inspection, copying and auditing of their accounts and records set forth in Clause 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 8 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 here under 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, as well as the Personnel and agents of the Consultants and any Sub consultants, 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 6 hereof shall constitute the Consultants' sole remuneration in connection with this Contract or the Services and 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, as well as the Personnel and agents of either of them, similarly shall not receive any such additional remuneration.

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 Sub consultant and any entity affiliated with such Sub consultant, 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 Sub consultants 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 Sub consultants 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 Sub consultants to take out and maintain, at their (or the Sub consultants', as the case may be) own cost but on 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's request, 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 and in such form and detail as will clearly identify all relevant time charges and cost, and the bases thereof (including the bases of the Consultants' costs and charges), and (ii) shall permit the Client or its designated representative periodically, and up to 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.

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** here to, in the form, in the numbers and within the time periods set forth in the said Appendix.

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 I 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 Professional / Sub Professional Personnel are described in Appendix B.
- (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

- (ii) any individual by more than 10% or one week, whichever is larger, and 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 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. If the Client does not object in writing (stating the reasons for the objection) within twenty-one (21) calendar days from the date of receipt of such biographical data, 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 as 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 Personnel

Removal and/or replacement of Personnel shall be regulated as under:

4.5.1 In case notice to commence services pursuant to Clause 2.1 of this Contract is not ordered by Client within 120 days of negotiations the key personnel can excuse themselves on valid grounds, e.g., selection on some other assignment, health problem developed after contract negotiation, 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 equal or better scoring person, whenever mobilization is ordered.

4.5.2 In case notice to commence services is given within 120 days of negotiations the replacement shall be as below:

- (a) Replacement up to 33%: Replacement shall be by an equal or better scoring person. Reduction in remunerations for the balance period shall be @ 5% of the monthly rate.
- (b) Replacement of more than 33% and up to 50%: Replacement shall be by an equal or better scoring person. Reduction in remunerations for the balance period shall be @ 10% of the monthly rate.
- (c) Replacement beyond 50% and upto 66% . Replacement shall be by an equal or better scoring person. Reduction in remunerations for the balance period shall be @ 15% of the monthly rate.
- (d) Replacement beyond 66 %shall normally not be considered. However in exceptional circumstances, where it becomes absolutely essential the remunerations of the substitute shall be reduced by 50 % of the original person replaced. Replacement shall be by an equal or better scoring person, The Department may initiate action for termination/debarment of such consultant for future projects of **MORT&H ,NHAI, IAHE, NHIDCL & State PWD** for a period of 6 months to 24 months depending upon the severity of case.

4.5.3 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.

4.5.4 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.

4.5.5 If the team leader or any other key personnel/ specialist considered pivotal to the project is replaced, the substitute may be interviewed by **MORT&H /RCD Bihar** to assess their merit and suitability.

4.5.6 If any member of the approved team of a consultant engaged by **MORT&H /RCD Bihar** leaves that consultant before completion of the job, he shall be barred for a period of 6 months to 24 months from being engaged as a team member of any other consultant working (or to be appointed) for any other **MORT&H /NHAI/ IAHE/NHIDCL / State PWD** projects.

4.5.7 In exceptional situations where the replacement with equivalent or better qualification is not available, replacement with lower qualifications than the originally approved may be accepted with reduction in remuneration as per the procedure prescribed below. This kind of relaxation shall however, be limited to replacement of 2 key personnel only in one consultancy contract package.

i) The new proposed personnel as a replacement has to be evaluated as per the criteria fixed at the time of evaluation of original proposal and marks/rating and then:

-If the original personnel (included in the original proposal based on which the contract was awarded) is to be replaced at the instruction of **MORT&H /RCD Bihar** and the new proposed personnel is having less qualification/ experience i.e marks/rating (but fulfilling the minimum requirement as per TOR), his remuneration would be reduced by 15% over and above the stipulated

conditions in the contract because of less qualified personnel

-If the original personnel (included in Contract Agreement) is to be replaced by the Consulting firm and the new proposed personnel is having less qualification/ experience (marks/rating), then his remuneration would be decreased proportionally in comparison to the marks of the original personnel. This will also take into account the contract condition and if the proposed reduction is less than that stipulated in contract condition, it would be as per the contract provision.

It will be ensured that the new proposed personnel should score at least 75% of the marks of the originally approved key personnel. Both the Consulting firm and the proposed personnel should give the undertaking in the format available in Form VII of Appendix II along with the replacement CV.

ii) The CV should be signed by personnel and the consulting firm in every page. If the CV is found incorrect at later date, the personnel accepted would be removed from the assignment and debarred from further **MORT&H /NHAI/ IAHE/NHIDCL / State PWD** works for an appropriate period to be decided by **MORT&H /RCD Bihar** and the new proposed personnel in place of removed personnel would be paid 15% less salary than the original personnel. 15% reduction in the salary will be imposed as penalty for submitting the incorrect information. This penalty will be imposed only once. If the same consulting firm submits incorrect information again second time, necessary action will be taken by **MORT&H /RCD Bihar** to blacklist the firm.

4.6 Resident Project Manager

If required by the SC, the Consultants shall ensure that at all times during the Consultants' performance of the Services in the Government's country a resident project manager, acceptable to the Client, shall take charge of the performance of such 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, Sub consultants 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;

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 Sub consultants 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),

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) hereinafter.

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) Notwithstanding 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

The Consultant will be paid stage-wise as a percentage of the contract value as per the schedule given below:

S.No	Item	Payment as % of contract value
1	Submission of final Inception Report	15%
2	Submission of final Alignment Report	10%
3	Submission of final Feasibility Report	5%
4	Submission of final Land Acquisition Report	10%
5	Submission of clearance proposals	5%
6	Submission of Draft DPR	10%
7	Approval of Final DPR	10%
8	Approval of Technical Schedules	5%
9	3D publication	10%
10	Clearance – Stage I Approval	5%
11	Clearance – Stage II/Final Approval	5%
12	Retention to be released after 3 years	10%
	Total:	100%
13	Bonus on submission of draft 3A within 1 month of alignment finalization	2.5% bonus
14	Bonus on submission of draft clearance proposals within 1 month of alignment finalization	2.5% bonus

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 **MORT&H/ RCD Bihar** from time to time.

- (c) 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.
- (d) The Client shall cause the payment of the Consultants in Para 6.4 (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.
- (e) 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.
- (f) All payments under this Contract shall be made to the account of the Consultants specified in the SC.

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 points established by the Consultant shall be protected by the Consultants till the completion of the Consultancy Services.

7.2 Retention Money

An amount equivalent to 10% of the contract value shall be retained at the end of the contract for accuracy of design and quantities submitted 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 up to the period as above.

7.3 Penalty

7.3.1. Penalty for Error/Variation

- (i) If variation in any of the main quantities of work like earth work including sub grade, GSB, WMM, Bituminous works (BM/DBM/AC/BC), drains, total concrete quantities and reinforcing steel in bridge works or overall project cost, found during execution is more than +/- 15%, the penalty equivalent to 5% of the contract value shall be imposed. For this purpose retention money equivalent to 5% of the contract value will be forfeited. This shall exclude any additional/deletion of items/works ordered during the execution
- (ii) For inaccuracies in survey/investigation/design work the penalties shall be imposed as per details given in Table below:

Sl. No.	Item	Penalty (%age of contract value)
1	Topographic Surveys	0.5 to 1.0
	<i>a) The horizontal alignment does not match with ground condition.</i>	
	<i>b) The cross sections do not match with existing ground.</i>	
	<i>c) The co-ordinates are defective as instruments of desired accuracy not used.</i>	
2	Geotechnical Surveys	0.5 to 1.0
	<i>a) Incomplete surveys</i>	
	<i>b) Data not analysed properly</i>	
	<i>c) The substrata substantially different from the actual strata found during construction.</i>	
3	Traffic data found to be varying by more than 25% on resurvey at a later date, unless there are justifiable reasons.	0.2 to 0.5
4	Axle load data found to be varying by more than 25% on resurvey at a later date, unless there are justifiable reasons.	0.20 to 0.5
5	Structural Designs found to be unsafe or grossly over safe.	1.0 to 2.0

7.3.2 Penalty for delay

In case of delay in completion of services, a penalty equal to 0.05% of the contract price per day subject to a maximum 5% 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.

7.3.3 Total amount of recovery from all penalties shall be limited to 10% of the Consultancy Fee.

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 Warning / Debarring

In addition to the penalty as mentioned in para 7.3, warning may be issued to the erring consultants for minor deficiencies. In the case of major deficiencies in the Detailed Project Report involving time and cost overrun and adverse effect on reputation of **MORT&H /RCD Bihar** other penal action including debarring for certain period may also be initiated as per policy of **MORT&H /RCD Bihar**

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 Settlement

Any dispute between the Parties as to matters arising pursuant to this Contract which cannot be settled amicably within thirty (30) days after receipt by one Party of the other Party's request for such amicable settlement may be submitted by either Party for settlement in accordance with the provisions specified in the SC.

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 Annex-1 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 more 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% .

In case the length of 4 lane road is increased up to 10% of the length as indicated in the RFP: **No change in Consultancy Fees**

In case the length of 4 lane road is increased by more than 10% of the length as indicated in the RFP : The consultancy fee shall be increased by 0.25 times the average quoted rate (Rs per km) for the increased length of 4 lane beyond 10%

- (iii) Length of Bypass / realignment shall not be treated as additionality to the existing length of the highway for the purpose of change / variation in length. 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.

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”

The language is: **English**

The addresses are:

For the Client : Ministry of Road Transport & Highways through
Chief Engineer (N.H Wing), Road Construction Department
Govt of Bihar, Vishweshvaraiya Bhawan, Patna- 800015

Attention : Executive Engineer,
NH Division Gulzarbag, Patna.

Phone No..... Mob.-9470001312; Fax:011-.....E-mail: eenhgulzarbagh@gmail.com

For the Consultants:

Attention:	Name		
	Designation		
	Address		
	Tel:	Fax:	E-mail address

Notice will be deemed to be effective as follows:

in the case of personal delivery or registered mail, on delivery;
In the case of facsimiles, 24 hours following confirmed transmission.
In case of E mail, 24 hours following confirmed transmission.

1.8 Entity to Act as Member in charge (In case of Joint Venture of Consultants) with or without an Associate:

-
1.9 The Authorized Representatives are:

For the Client : (--)
Ministry of Road Transport & Highways through Chief Engineer (N.H Wing), Road Construction Department Govt of Bihar, Vishweshvaraiya Bhawan, Patna- 800015

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 **MORT&H**
- (b) The consultant will furnish within 15 days of the issue of letter of acceptance, an unconditional Bank Guarantee from a Nationalised Bank, IDBI or ICICI/ICICI Bank/Foreign Bank/EXIM Bank / Any Scheduled Commercial Bank approved by RBI having a networth of not less than 500 crore as per latest Annual Report of the Bank. In the case of a Foreign Bank (issued by a Branch in India) the networth 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 Nationalised Bank in India. In case of JV, the BG shall be furnished on behalf of the JV or lead partner of JV for an amount equivalent to **10 %** of the total contract value to be received by him towards Performance Security valid for a period of **three years** beyond the date of completion of services.

2.2 The time period shall be “fourmonths” 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 **8 (Eight) months** or such other time period as the parties may agree in writing.

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 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 **Executive Engineer, NH Division Gulzarbagh, Patna.** 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 **MORT&H through Chief Engineer (N.H Wing), Road Construction Department, Govt. Of Bihar, Patna.** in a joint venture or 'in association', the policy must be procured and provided to **RCD Bihar** by the joint venture/in association entity and not by the individual partners of the joint venture/association.
- (vi) The contract may include a provision whereby the Consultant does not cancel the policy midterm without the consent of **MORT&H/RCD Bihar** 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.

3.9 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**

Service Tax)

6.3 (a) No advance payment will be made.

6.3 (e) The interest rate is : @ 12% per annum

6.3 (f) **The account is :**

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 or an arbitration panel composed of three arbitrators, in accordance with the following provisions:

- (a) Where the Parties agree that the dispute concerns a technical matter, they 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 the 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.
- (b.) Where the Parties do not agree that the dispute concerns a technical matter, the Client and the Consultants shall each appoint one arbitrator, and these two arbitrators shall jointly appoint a third arbitrator, who shall chair the arbitration panel. If the arbitrators named by the Parties do not succeed in appointing a third arbitrator within thirty (30) days after the later of the two arbitrators named by the Parties has been appointed, the third arbitrator shall, at the request of either Party, be appointed by Secretary, the Indian Council of Arbitration, New Delhi.
- (c) If, in a dispute subject to Clause SC 9.2.1 (b), one Party fails to appoint its arbitrator within thirty (30) days after the other Party has appointed its arbitrator, the Party which has named an arbitrator may apply to the Secretary, Indian Council of Arbitration, New Delhi, to appoint a sole arbitrator for the matter in dispute, and the arbitrator appointed pursuant to such application shall be the sole arbitrator for that dispute.

9.2.2 Rules of Procedure

Arbitration proceedings shall be conducted in accordance with procedure of the Arbitration & Conciliation Act 1996, of India unless the Consultant is a foreign national/firm, where arbitration proceedings shall be conducted in accordance with the rules of procedure for arbitration of the United Nations Commission on International Trade Law (UNCITRAL) as in force on the date of this Contract.

9.2.3 Substitute Arbitrators

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.

9.2.4 Qualifications of Arbitrators

The sole arbitrator or the third arbitrator appointed pursuant to paragraphs (a) through (c) of Clause 8.2.1 hereof shall be an internationally recognized legal or technical expert with extensive experience in relation to the matter in dispute.

9.2.5 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; and
[Note: English language may be changed to any other Language, with the agreement of both the Parties.]
- (c) the decision of the sole arbitrator or of a majority of the arbitrators (or of the third arbitrator if there is no such majority) 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.
- (d) The maximum amount payable per Arbitrator in Arbitration clauses shall be as under

S.No	Particulars	Maximum amount payable per Arbitrator/ per case
1	Arbitrator fee	Rs 15,000/- per day subject to a maximum of Rs 4 lacs or Rs 2.5 lacs (lump sum) subject to publishing the award within 12 months.
2	Reading charges	Rs 15,000/-
3	Secretarial Assistance and Incidental charges (telephone, fax, postage etc)	Rs 20,000/-
4	Charges for publishing/ declaration of the award	Rs 20,000/-
5	Other expenses (As per actual against bills subject to maximum of the prescribed ceiling given below)	
	Traveling expenses Lodging and Boarding	Economy class (by air), First class AC (by train) and AC Car (by road) a) Rs 15,000/- per day (in metro cities) b) Rs 7,000/- per day (in other cities) c) Rs 3,000/- per day if any Arbitrator makes their own arrangements.
6	Local travel	Rs 1,500/- per day
7	Extra charges for days other than hearing/ meeting days (maximum for 2 days)	Rs 3,500/- per day
Note:-	1. Lodging boarding and traveling expenses shall be allowed only for those members who are residing 100 kms. Away from place of meeting. 2. Delhi, Mumbai, Chennai, Kolkata, Bangalore and Hyderabad shall be considered as Metro Cities.	

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 **MORT&H** before appointment of the Arbitrator,

Appendix A

Terms of reference containing, inter-alia, the Description of the Services and Reporting Requirements

Appendix B

Consultants' Subconsultants, Key Personnel and Sub Professional Personnel

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

Appendix E

Cost Estimate

Appendix F

Minutes of Financial/ Contract Negotiations with the Consultant

Appendix G: Copy of letter of invitation

Appendix H: Copy of letter of acceptance

Format for Bank Guarantee for Performance Security (For individual work)

BANK GUARANTEE FOR PERFORMANCE SECURITY

To,
Executive Engineer,
N.H , Division Gulzarbagh ,Patna

In consideration of “**Ministry of Road Transport & Highways through Chief Engineer (N.H Wing), Road Construction Department, Govt. Of Bihar, Patna** ” (hereinafter referred as the “Client”, which expression shall, unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to

M/s.....having its office at
..... (Hereinafter referred to as the “Consultant” which expression shall repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns), a contract by issue of client’s Contract Agreement no. / Letter of Acceptance No.

..... dated
..... and the same having been unequivocally accepted by the Consultant, resulting in a Contract valued at Rs...../- (Rupees.....) excluding service tax for

“**Consultancy Services for preparation of Feasibility Study and Detailed Project Report for Improvement to Two Lane with Paved shoulder of**

- (1) Stretch from Gopalganj on NH-27- Areraj - Sugauli on NH-727
- (2) Stretch from Bettiah on NH-727 - Chanpatia - Narkatiaganj - Amolwa - Bhitiharwa Ashram - Prakhanda Gawnaha - Indo / Nepal Border
- (3) Stretch from Shautarwa on NH-727 - Dhanha - Tamkuha Bazar - Bansi - Padrauna on NH-727
- (4) Areraj - Motihari in Bihar on EPC Mode.**DPR/BIHAR/NHD-MOD-PAT/02**

(**Total Length- 250 km**)on **new NHs**-inthe states of
under – Contract Package No. (Hereinafter called the “Contract”), and the Consultant having agreed to furnish a Bank Guarantee to the Client as “Performance Security as stipulated by the Client in the said contract for performance of the above Contract amounting to Rs...../- (Rupees.....).

We,having registered office at, a body registered/constituted under the(hereinafter referred to as the Bank), which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the client immediately on demand any or, all money payable by the Consultant to the extent of Rs.(Rupees.....) as aforesaid at any time up towithout any demur, reservation, contest, recourse or protest and/or without any reference to the consultant. Any such demand made by the client on the bank shall be conclusive and binding notwithstanding any difference between the Client and the Consultant or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. We agree that the Guarantee herein contained shall be irrevocable and shall continue to be enforceable till the Client discharges this guarantee.

The Client shall have the fullest liberty without affecting in any way the liability of the Bank under this Guarantee, from time to time to vary or to extend the time for performance of the

contract by the Consultant. The Client shall have the fullest liberty without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the consultant and to exercise the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Client and the Consultant any other course or remedy or security available to the Client. The bank shall not be relieved of its obligations under these presents by any exercise by the Client of its liberty with reference to the matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on the part of the Client or any other indulgence shown by the Client or by any other matter or thing whatsoever which under law would but for this provision have the effect of relieving the Bank.

The Bank also agrees that the Client at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Consultant and notwithstanding any security or other guarantee that the Client may have in relation to the Consultant's liabilities.

Notwithstanding anything contained herein,

Our liability under this Bank Guarantee is limited to Rs. (Rupees.....) and it shall remain in force up to and including and shall be extended from time to time for such period as may be desired by M/s....., on whose behalf this guarantee has been given.

This Bank Guarantee shall be valid up to

We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before (date of expiry of Guarantee).

(Signature of the Authorised Official)

(Name & Designation with Bank Stamp)

NOTE:

The bank guarantee(s) contains the name, designation and code number of the officer(s) signing the guarantee(s).

The address, telephone no. and other details of the Head Office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing Branch.

The bank guarantee for Rs. 10,000 and above is signed by at least two officials (or as per the norms prescribed by the RBI in this regard).

Appendix J : Reply to Queries of the Bidder