



REQUEST FOR PROPOSAL

FOR

CONSULTANCY SERVICES FOR PREPARATION OF DETAILED PROJECT REPORT

For

Consultancy Services for preparation of Detailed Project Report (DPR) for "Improvement/Upgradation and Strengthening of 1 no. State Highways (SH-97), 1 no. Major District Roads (MDR) proposed to be upgraded with 2-Lane paved shoulder configuration and 1 High Level Bridge and its approach road, proposed for ADB Assistance under implementation of Bihar State Highways Project-IV (BSHP-IV)".

Quality- and Cost- Based Selection (QCBS)

August, 2022

**CHIEF GENERAL MANAGER
BIHAR STATE ROAD DEVELOPMENT CORPORATION LTD.
(A Government of Bihar Undertaking)
RCD CENTRAL MECHANICAL WORKSHOP CAMPUS
NEAR PATNA AIRPORT, SEIKHPURA
PATNA-800 014**

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BIHAR STATE ROAD DEVELOPMENT CORPORATION LIMITED

(A Government of Bihar Undertaking)

RCD Mechanical Workshop Campus, Near Patna Air Port, Sheikhpura, Patna, Bihar 800014

Phone: 0612 222 6711, Fax: 0612 2226723

Ref. No. BSRDCLtd.-3815/2022

Date:

INVITATION FOR RFP

(Through e-procurement mode only- www.eproc.bihar.gov.in)

Invitation for RFP for:-

Consultancy Services for preparation of Detailed Project Report (DPR) for "Improvement/Upgradation and Strengthening of 1 no. State Highways (SH-97), 1 no. Major District Roads (MDR) proposed to be upgraded with 2-Lane paved shoulder configuration and 1 High Level Bridge and its approach road, proposed for ADB Assistance under implementation of Bihar State Highways Project-IV (BSHP-IV)".

Bihar State Road Development Corporation Ltd. Patna (A Government of Bihar Undertaking) entrusted with the work of "Improvement/Upgradation and Strengthening of 1 no. State Highways (SH-97), 1 no. Major District Roads (MDR) proposed to be upgraded with 2-Lane paved shoulder configuration and 1 High Level Bridge and its approach road, proposed for ADB Assistance under implementation of Bihar State Highways Project-IV (BSHP-IV)". To facilitate this purpose, BSRDCL, Patna, Bihar, intends to engage the services of Technically Expert Consultancy Firms, who have requisite experience in the field of making DPRs for the development of Highways, ROBs/Bridges/Elevated Roads.

Accordingly, BSRDCL intends to procure Consultancy Services for the Appointment of DPR Consultants for the following proposed Road/Bridge/elevated Road projects:-

Sl No.	Name of Project	Road Name	Length (Km)	Group Length (Km)	Package	Cost of RFP (in ₹)	Bid Security (In ₹)	Time of Completion (in months)
1	"Improvement/Upgradation and Strengthening of 1 no. State Highways (SH-97), 1 no. Major District Roads (MDR) proposed to be upgraded with 2-Lane paved shoulder configuration and 1 High Level Bridge and its approach road, proposed for ADB Assistance under implementation of Bihar State Highways Project-IV (BSHP-IV)".	Singhara on proposed Amas Darbhanga Road-Mahua-Vaishali Road	42	42	Package 9	5000	100000	4
2		High level Bridge & Approach Road on Hathouri-Atrar-Bavangama-Aurai Road	0.915	0.915	Package 12	5000	100000	4
3		SH 97 Atarbel (at NH57) – Jalley – Ghoghachatti (at SH52) Road	31.70	31.70	Package 13	5000	100000	4

Total 74.615 74.615

- RFP is invited from eligible Consultancy Firms for engaging DPR Consultants on the basis of-Open Competitive Bidding. The selection of DPR Consultants would be on QCBS Basis with 70:30 weightage for Technical and Financial Scores respectively.

3. The proposal shall be submitted in English Language and all correspondence would be in the same language.
4. The selection of DPR Consultants shall follow the laid down procedures given in the RFP Document.
5. The interested consultancy firms may download the RFP document from the e-tendering Portal of Govt. of Bihar (eproc.bihar.gov.in) w.e.f. the scheduled date and time as mentioned in critical data sheet. The Consultant who downloads the RFP document from the website will be required to pay the non-refundable fee of Rs. 5,000/- at the time of the submission of the proposal, in the form of Demand Draft in favour of Bihar State Road Development Corporation Limited, Patna. The RFP will be invited through e-tendering portal “eproc.bihar.gov.in”. The BSRDCL invites proposals through e-tendering Portal of Govt. of Bihar i.e. www.eproc.bihar.gov.in (on-line Technical as well as Financial Proposal submission by using the portal). The complete RFP document can be viewed / downloaded from www.eproc.bihar.gov.in and can also be viewed on official portal of BSRDCL <http://bsrdcl.bihar.gov.in> as per schedule given in Critical Data Sheet as under:-

Critical Data Sheet:

Sl. No.	Description	Date
1	Date of issue of notice inviting RFP	25.07.2022
2	Period of sale/downloading of RFP Document	From 04.08.2022 Time 10.00 AM IST to 24.08.2022 up to 3.00 PM IST
3	Last date for receiving queries	11.08.2022 upto 3.00 PM IST
4	Pre-Proposal Meeting	11.08.2022 Time 3:30 PM IST At BSRDCL HQ, PATNA
5	Authority response to Pre Proposal queries latest by	16.08.2022
6	Last date of submission/Uploading of completed RFP (i.e. Proposal due date)	Date 24.08.2022 Up To 5:00 PM IST Through website: www.eproc.bihar.gov.in only
7	Last date of submission of Demand draft & Bid security for RFP and other documents in original at BSRDCL HQ	26.08.2022 Time 12:00 Noon
8	Opening of Technical Proposal	Date 26.08.2022 on 12:30 PM IST Through website: www.eproc.bihar.gov.in only
9	Declaration of technically eligible / qualified Consultant	08.09.2022
10	Standstill Period for receiving clarification by bidders only.	7 days from Declaration of eligible / Technically qualified Consultant
11	Opening of Financial Proposal of qualified Consultant	15.09.2022 at 12.30 PM IST Through website: www.eproc.bihar.gov.in only
12	Letter of Acceptance (LOA)	22.09.2022
13	Validity of Proposal	180 Days
14	Signing of Agreement	To be Notified later
15	Address for communication,	Chief General Manager, Bihar State Road Development Corporation Ltd. RCD Mechanical Workshop Campus, Near Patna Air Port, Sheikhpura, Patna, Bihar 800014

Note – Dates mentioned at Sl. No. 9 to 12 are tentatively planned only, may be changed.

6. The interested Consultancy Firms who have experience in preparation of DPR for Roads and Bridges/ Elevated structure and fulfilling technical and financial criteria as specified in RFP may obtain Request for Proposal (RFP) document from-www.eproc.bihar.gov.in only.

7. The interested consultancy firms shall also have to comply the requirement of registration, if applicable as per office memorandum no, F.No. 6/18/2019-PPD dated 23rd July, 2020 issued by Public Procurement Division, Deptt. Of Expenditure, Ministry of Finance, Govt. Of India, are only eligible.
8. The Applicant shall furnish as part of its Proposal, a Bid Security in the favour of Chief General Manager, Bihar State Road Development Corporation Ltd. Patna for an amount of Rs.1,00,000.00 (One Lakh Only) in the form of Demand Draft/Bank Guarantee from any Nationalized Bank and shall remain valid till 28 days beyond the Bid validity period of 180 days. Separate RFP cost and Bid Security for each Package is required. Bid Security in Original form will have to be deposited along with Hard Bound Copy of Technical Proposal only in the office of Chief General Manager, Bihar State Road Development Corporation Ltd. Patna on or before 12:00 Hrs on date specified above and mentioned in Data Sheet, failing which the Proposal will be rejected.
9. A Consultant intends to apply for more than one project, will have to buy such numbers of RFP appropriate for the projects and submit the proposals for each project separately.
10. E-tendering processing fee, as applicable shall be paid online to BELTRON at the time of uploading of RFP.
11. For participating in E-RFP process, the applicant shall have to get them registered to get user ID Password and digital Signature. This will enable them to access the website-www.eproc.bihar.gov.in and participate in e-tender. Those who are not registered in e-tendering systems, they may contact "e-procurement HELPDESH, 1st Floor, M/22 Road No.-25, Sri Krishna Nagar, Bank of India Compound, Patna -800001" (Phone No.-0612-2523006, 7542028164) for registration.
12. The blank RFP documents can be downloaded from the website-www.eproc.bihar.gov.in, where electronic RFP form is provided.
13. Consultants can access RFP documents on the website, fill them and submit the completed RFP document into Electronic RFP on the website itself Consultants shall attach scanned copies (PDF/JPG) of all the required RFP papers, Bank Draft, Bank Guarantee, & the certificates as required in Eligibility criteria.
14. All the uploaded documents shall have the signature of Consultants or their authorized signatories. The scanned copies should be of the original papers and certificates.
15. The Consultant is requested to check their file size of uploaded documents at the time of submission & they should ensure that work file is uploaded if they feel that the complete file is not uploaded then they should click on cancel & update the same before submission. The Consultant should satisfy themselves of Download ability and visibility of the scanned & uploaded file by them.
16. The Consultant is directed to zip their files using Win Zip or Win RAR software only. Other formats of zipping will not be accepted and will be rejected.
17. The Consultant must use MS Office-2007 or lower version.
18. No claim shall be entertained on account of disruption of internet service being used by Consultants. Consultants are advised to upload their bids well in advance to avoid last minute technical stage.
19. Corrigendum/Addendum/Corrections, if any will be published on the e-proc/bsrdc Ltd website-<http://bsrdcl.bihar.gov.in>
20. The BSRDC Ltd. reserves the right to extend /cancel the tender (RFP), either for all Projects or any of the Projects, at any stage without assigning any reason.
21. Detailed NIT and other terms & conditions can be seen on www.eproc.bihar.gov.in. For any query, Mr Asad Intekhab Nayyar DGM (Tech) Mobile No.-9431005709 may be contacted.

(Chief General Manager)
Bihar State Road Development Corporation Ltd.
RCD Mechanical Workshop Campus,
Near Patna Air Port, Sheikhpura,
Patna, Bihar 800014

Bihar State Road Development Corporation Limited, Patna***Invitation of proposals for Consultancy Services for
Preparation of Detailed Project Report*****1. BRIEF SCOPE OF WORK**

BSRDCL, PATNA is planning to "Improvement/Upgradation and Strengthening of 1 no. State Highways (SH-97), 1 no. Major District Roads (MDR) proposed to be upgraded with 2-Lane paved shoulder configuration and 1 High Level Bridge and its approach road,, proposed for ADB Assistance under implementation of Bihar State Highways Project-IV (BSHP-IV)". as per the details given in this Request for Proposal. BSRDCL hereby invites proposals for preparation of detailed project report for this road project.

2. MODE OF ACCESS FOR BID DOCUMENTS

The interested consultancy firms may download the RFP document from the e-tendering Portal of Govt. of Bihar (eproc.bihar.gov.in) w.e.f. the scheduled date and time as mentioned in critical data sheet. The Consultant who downloads the RFP document from the website will be required to pay the non-refundable fee of Rs. 5,000/- at the time of the submission of the proposal, in the form of Demand Draft in favour of Bihar State Road Development Corporation Limited, Patna. The RFP will be invited through e-tendering portal "eproc.bihar.gov.in".

3. A **PRE-BID** meeting will be held on 11.08.2022 at 15:30 hrs in the office of the **Chief General Manager, BSRDCL, Patna.**

4. SUBMISSION OF DOCUMENTS

Original Bid Security, Power of Attorney, Signing the Bid, Original JV Agreement (if applicable) s should reach BSRDCL, PATNA at the address for communication as mentioned below not later than 12:00 noon on 26.082022.

5. OPENING OF BID:

The technical proposal of bids received on or before the submission date shall be opened on 12:30 hrs. on 26.082022. The bidders who have been declared successful on the basis of technical evaluation shall be informed regarding the schedule of opening of the financial proposal separately.

6. CONDITIONS ISSUED BY BSRDCL, PATNA

Proposal should be uploaded on the e-Proc web site well in advance. BSRDCL, Patna/e-Proc, shall not be held responsible for any delay due to problems of server/network issue, in receiving the proposals and reserves the right to accept/reject proposals without assigning any reason thereof. The consultancy firms will be selected as per the guidelines indicated in RFP document.

7. ADDRESS FOR COMMUNICATION

Sanjay Kumar,
Chief General Manager,
Bihar State Road Development Corporation Limited,
RCD Central Mechanical Workshop Campus,
Near Patna Airport, Seikhpura, Patna-800 014
Tel: 0612-2226711 Fax: 0612-2226712
Email: bsrdcltd@gmail.com, Web site: www.bsrdcl.bih.nic.in

SECTION-1. LETTER OF INVITATION

For Full Technical Proposals using Quality and Cost-Based Selection (QCBS) Method

Ref. No.:

Dated :-

[Contact Person & Designation]

[Name of Firm & Address]

To,

.....
.....
.....

BIHAR STATE ROAD DEVELOPMENT CORPORATION LIMITED

CONSULTING SERVICES FOR PREPARATION OF DETAILED PROJECT REPORT

1. BIHAR STATE ROAD DEVELOPMENT CORPORATION LIMITED PATNA now invites proposals from Consultants fulfilling the requisite criteria for preparation of Detailed Project Report for

"Improvement/Upgradation and Strengthening of 1 no. State Highways (SH-97), 1 no. Major District Roads (MDR) proposed to be upgraded with 2-Lane paved shoulder configuration and 1 High Level Bridge and its approach road, proposed for ADB Assistance under implementation of Bihar State Highways Project-IV (BSHP-IV)". "as mentioned in clause 1.8(i) of Instructions to Consultants.

The consultants will be selected and engaged in accordance with QCBS methodology.

The deadline for uploading the documents on e-Proc shall be **24.08.2022 up to 5:00 pm IST.**

2. The **Background Information and Terms of Reference** for the Consulting services is provided in Section 5 of the Request for Proposal (RFP).
4. Consultants are not allowed to transfer this invitation to another consulting firm. The proposals must be submitted in the same name and capacity in which the RFP document has been purchased. If the submitted proposals will be in the name of another firm, the BSRDCL may consider the proposal as non-responsive. The Bihar State Road Development Corporation Limited (BSRDCL) Patna, Bihar reserves the right to accept or reject any proposal, and to annul the selection process and reject all proposals at any time prior to the award of contract, without thereby incurring any liability or any obligation in any form to the affected firms on any grounds.
5. The RFP includes the following documents:
 - Section 1 - Letter of Invitation
 - Section 2 - Instructions to Consultants including Data Sheet and Evaluation Criteria
 - Section 3 - Technical Proposal Standard Forms
 - Section 4 - Financial Proposal Standard Forms
 - Section 5 - Terms of Reference
 - Section 6 - Standard Form of Contract
6. A Pre-bid meeting has been scheduled on 11.08.2022 at the office of the undersigned at 15:30 hrs where all issues/clarifications could be discussed and finalized.

**Chief General Manager,
BSRDCL, Patna**

SECTION 2.

INSTRUCTIONS TO CONSULTANTS

1. INTRODUCTION

General

- 1.1 Bihar State Road Development Corporation Limited (BSRDCL) Patna, Bihar will select a consulting firm /organization (the Consultant) in accordance with the method of selection specified in the Data Sheet.
- 1.2 Consultants should familiarize themselves with local conditions and take them into account in preparing their Proposals. To obtain first-hand information on the assignment and local conditions, Consultants are encouraged to visit the project site.
- 1.3 Consultants shall bear all costs associated with the preparation and submission of their Proposals. Costs might include site visit; collection of information; and, if selected, attendance at contract negotiations etc.
- 1.4 The Bihar State Road Development Corporation Limited (BSRDCL), Patna, Bihar is not bound to accept any Proposal and reserves the right to annul the selection process at any time prior to contract award, without thereby incurring any liability to the Consultants.
- 1.5 In preparing their Proposals, Consultants are expected to examine in detail the documents comprising the RFP. Material deficiencies in providing the information requested may result in rejection of a Proposal.

Conflict of Interest

- 1.6 BSRDCL, PATNA, BIHAR requires the Consultants to provide professional, objective, and impartial advice and at all times hold the Client's interests paramount, avoid conflicts with other assignments or their own corporate interests and act without any consideration for future work. Consultants shall not be recruited for any assignment that would be in conflict with their prior or current obligations to other clients, or that may place them in a position of not being able to carry out the assignment in the best interest of the Bihar State Road Development Corporation Limited, Patna, Bihar. Without limitation on the generality of the foregoing, Consultants, and any of their associates shall be considered to have a conflict of interest and shall not be recruited under any of the circumstances set forth below:
 - (i) If a Consultant combines the function of consulting with those of contracting and/or supply of equipment; or
 - (ii) If a Consultant is associated with or affiliated to a contractor or manufacturer; or
 - (iii) If a Consultant is owned by a contractor or a manufacturing firm with departments or design offices offering services as Consultants. The Consultant should include relevant information on such relationships along with a statement in the Technical Proposal cover letter to the effect that the Consultant will limit its role to that of a Consultant and disqualify itself and its associates from work, in any other capacity or any future project within the next five years (subject to adjustment by BSRDCL, PATNA, BIHAR in special cases), that may emerge from this assignment (including bidding or any part of the future project). The contract with the Consultant selected to undertake this assignment will contain an appropriate provision to such effect; or
 - (iv) If there is a conflict among consulting assignments, the Consultant (including its personnel and sub-consultants) and any subsidiaries or entities controlled by such Consultant shall not be recruited for the relevant assignment. The duties

of the Consultant depend on the circumstances of each case. While continuity of consulting services may be appropriate in particular situation if no conflict exists, a Consultant cannot be recruited to carry out an assignment that, by its nature, will result in conflict with another assignment of such Consultant. For example, a Consultant engaged to prepare engineering design for an infrastructure project shall not be recruited to prepare an independent environmental assessment for the same project; similarly, a Consultant assisting a client in privatization of public assets shall not purchase, nor advise purchasers of, such assets or a Consultant hired to prepare terms of reference for an assignment shall not be recruited for the assignment in question.

Fraud and Corruption

1.7 The BSRDCL, PATNA, BIHAR requires that consultants observe the highest standard of ethics during the procurement and execution of such contracts. In such pursuance of this policy, the BSRDCL, PATNA, BIHAR

- (i) defines, for the purposes of this provision, the terms set forth below as follows:
 - a) **“corrupt practice”** means behavior on the part of officials in the public or private sectors by which they improperly and unlawfully enrich themselves and/or those close to them, or induce others to do so, by misusing the position in which they are placed, and it includes the offering, giving, receiving, or soliciting of anything of value to influence the action of any such official in the procurement process or in contract execution; and
 - b) **“fraudulent practice”** means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the borrower, and includes collusive practices among bidders (prior to or after bid submission) designed to establish bid prices at artificial, non-competitive levels and to deprive the borrower of the benefits of free and open competition).
- (ii) Will reject a proposal for award if it determines that the bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract; and
- (iii) Will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded any BSRDCL, PATNA, BIHAR contract if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, any BSRDCL, PATNA, BIHAR contract.

Proposal:

I. (i) Details of the Work is given below:-

Package No.	Name of the Road	Bid Security (in Rs.)	Time for Completion
1	Consultancy Services for and Preparation of Detailed Project Report for "Improvement/Upgradation and Strengthening of 1 no. State Highways (SH-97), 1 no. Major District Roads (MDR) proposed to be upgraded with 2-Lane paved shoulder configuration and 1 High Level Bridge and its approach road, proposed for ADB Assistance under implementation of Bihar State Highways Project-IV (BSHP-IV)" .	1,00,000 /-	4 Months

- (ii) The consultant will have to give a declaration form with RFP documents regarding the certificate that all data submitted in RFP document is correct and in case of any false submission client is independent to take legal action against him.

- (iii) The consultant will have to submit along with technical submission the attested copies of the Certificate from the employer regarding successful completion of DPR assignments within the stipulated time during the last 5(Five) years along with a certification by the consultants that the submitted certificate in original is with them and they will produce this at the time of verification and in case of any false submission client is independent to take legal action against him.

Proposal Validity

- 1.8 The Proposals must be remain valid for 180 days after the last submission date. During this period, the Consultants shall maintain the availability of experts nominated or mentioned in the Proposal. The Client will make its best effort to complete negotiations within this period. In case of expiry of bid validity, the Client may request Consultants to extend the validity period of their Proposals. Consultants have the right to refuse to extend the validity period of their Proposals.

Participation of International Consultants

- 1.9 In this assignment international consultants can also be deployed. Consultants are free to associate with any international consultant(s) considered to be suitable for the services required.

Participation of Government Employees

- 1.10 No current government employee shall be deployed by the consultant without the prior written approval by the appropriate authority.

1.11 Bid Security (Earnest Money Deposit)

- a. The bid security as mentioned in the table above shall be in form of Demand Draft/Bank Guarantee, from any nationalized/scheduled bank in favor of “Bihar State Road Development Corporation Ltd.” payable at Patna in the format as mentioned in Appendix- I of this RFP Document. Validity of Bid Security shall be 28 days beyond the validity of Bid; i.e. 28 days beyond 180 days.

The Employer shall reject any bid not accompanied by bid security, as non responsive.

- b. The bid security shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required performance security.
- c. The bid security may be forfeited:
- (a) If a Bidder withdraws its bid during the period of bid validity.
 - (b) If the successful Bidder fails to
 - (i) sign the Contract within required time frame;
 - (ii) furnish a performance security in accordance with clause 10 of GCC.

2. CLARIFICATIONS AND AMENDMENTS TO RFP DOCUMENTS

- 2.1 Consultants may request a clarification of any of the RFP documents prior to the Pre bid meeting date as indicated in the Data Sheet. Any request for clarification must be sent in writing to the address indicated in the Data Sheet. The Client will respond in writing and will publish the reply to the clarifications /amendments if any on BSRDCL website. If the client deems it necessary to amend the RFP as a result of a clarification, it shall do so following the procedure under Sub-Clause 2.2.
- 2.2 At any time before the submission of Proposals, the Client may, whether at its own initiative, or in response to a clarification requested by a firm, amend the RFP by issuing an addendum. The addendum shall be uploaded on e-proc /BSRDCL web site and will be binding on them. To give Consultants reasonable time in which to take an amendment into account in their Proposals, the Client may at its discretion, if the amendment is substantial, extend the deadline for the RFP submission.

3. PREPARATION OF THE PROPOSAL

- 3.1 Consultant's Proposal (the Proposal) will consist of three (3) components
- (i) Bid Security
 - (ii) The Technical Proposal, and
 - (ii) The Financial Proposal on e-proc.
- 3.2 **Bid Security:** Bid security as mentioned in clause no 1.12 above shall be placed in Envelope I. If the bid security is found proper, then only, technical and financial proposals will be entertained.
- 3.3 The Technical Proposal shall be placed in Envelope II.
- 3.4 Envelope-I & II shall be placed in outer envelope.
- 3.5 Each Envelope must be separately sealed. Outer Envelope must be marked as the submission address, reference number and title of the project.
- 3.6 The Proposal, as well as all related correspondence exchanged by the Consultants and the Client, shall be in English. All reports prepared by the contracted Consultant shall also be in English.
- 3.7 The Proposal should include a cover letter signed by person (s) with full authorization to make legally binding contractual (including financial) commitments on behalf of the firm. The letter should specify all association arrangements, and certify that each associated firm will perform its designated tasks under the assignment if the lead firm is awarded the contract.
- 3.8 The Technical Proposal should clearly demonstrate the Consultant's understanding of the assignment requirements and capability and approach for carrying out the tasks set forth in the TOR through the nominated experts.

4. THE TECHNICAL PROPOSAL

General

- 4.1 **The Technical Proposal shall not include any financial information and any Technical Proposals containing financial information shall be declared non-responsive.**

Technical Proposal Format

- 4.2 (i) The Consultant shall submit technical proposal as per the data sheet which indicates the format of the Technical Proposal to be used for the assignment. Submission of the wrong type of Technical Proposal will result in the Proposal being deemed non-responsive.
- (ii) The following table summarizes the content and maximum number of pages permitted for each type of Proposal. If the maximum number of pages is exceeded, a penalty will be applied during evaluation of the Proposal. A page is considered to be one printed side of A4 size paper.

Type of Proposal Proposal Content	Full Technical Proposal (FTP)
Cover Letter	maximum two (2) pages excluding necessary attachments.
Experience of the firm	(i) maximum two (2) pages introducing the firm and associate firm(s) background and general experience. (ii) maximum of twenty (20) pages completed projects in the format enclosed illustrating firm and associate(s) firm's relevant experience. No promotional material should be included.
General approach and methodology, work and staffing schedule	maximum ten (10) pages inclusive of charts and graphs
Experts' CVs	no limit but preferably should not exceed five (5) pages for each expert's CV.
Comments on terms of reference	no limit, but to be concise and to the point.
Counterpart staff and facility requirements.	maximum two (2) pages.

Technical Proposal Content

- 4.3 The Technical Proposal shall contain information indicated in the following paragraphs from (i) to (xi) using the Standard Technical Proposal Forms (Form I to Form IX). Such information must be provided by the Consultant and each Associate.
- (i) A brief description of the organization and outline of recent experience of the consultant and each associate on assignments of a similar nature is required in form-iii. For each assignment, the outline should indicate *inter-alia*, the assignment, contract amount and the consultant's involvement. Information should be provided only for those assignments for which the consultant was legally contracted by the client as a corporate entity or as one of the major participating consulting firms within an association (Joint venture). In case the assignment was carried out in joint venture then the JV agreement is to be submitted. Assignments completed by individual experts working privately or through other consulting firms cannot be claimed as the experience of the Consultant, or that of the Consultant's Associate(s), but can be claimed by the individuals themselves in their CVs. Consultants should be prepared to substantiate the claimed experience if so requested by the Client.
 - (ii) A concise, complete, and logical description of how the Consultant's team will carry out the services to meet all requirements of the TOR.
 - (iii) A work plan showing in graphical format (bar chart) the timing of major activities, anticipated coordination meetings, and deliverables such as reports required under the TOR.
 - (iv) An organization chart indicating relationships amongst the Consultant and any Associate(s), the Client and other parties or stakeholders, if any, involved in the assignment.
 - (v) Comments, if any, on the TOR to improve performance in carrying out the assignment. Innovativeness will be appreciated, including workable suggestions that could improve the quality/effectiveness of the assignment. In this regard, unless the Consultant clearly states otherwise, it will be assumed by the Client that work required to implement any such improvements, are included in the inputs shown on the Consultant's Staffing Schedule.
 - (vi) The Technical Proposal shall not include any financial information. Technical Proposals containing financial information shall be declared non responsive.

Personnel

- (vii) The name, age, nationality, background employment record, and professional experience of each nominated expert, with particular reference to the type of experience required for the TA should be presented in the CV format shown in Form -VII. (Proof of age and qualification should be submitted along with the CVs).
- (viii) Consultant may submit proposal for all packages but Team Leader should be different in each package and other Key Personnel may be repeated for maximum two packages and maximum two package will be awarded on bidder's priority basis.
- (ix) Higher rating will be given to nominated experts from the consulting firm and associated consulting firms, if any, who are regular full-time employees. The Client defines a regular full-time employee to be a person who has been employed continuously by the Consultant or one of its Associates, for more than twelve (12) months prior to the date of submission of the Proposal.
- (x) The Client requires that each expert confirm that the content of his/her curriculum vitae (CV) is correct and the experts themselves should sign the certification of the CV. Note that the need to provide address and fax/e-mail details of experts in the CVs of the experts is not considered mandatory. In cases where consulting firms/organizations are prevented from providing such information by prevailing laws in their country, or if Consultants have valid reasons not to comply with the completion of this item, there will be no negative impact on the evaluation of the expert.

(xi) A zero rating will be given to a nominated expert if the expert:

- (a) the CV is not signed in accordance with Sub-Clause 4.3 (x) requirements; or
- (b) is a current employee of the Employer (BSRDC Ltd.).

5. FINANCIAL PROPOSAL

- 5.1 All information provided in Consultants' Financial Proposal will be treated as 'Confidential'.
- 5.2 The Financial Proposal is to be submitted in the requisite forms enclosed.
- 5.3 No proposed 'schedule of payments' should be included in Consultants' Financial Proposals.
- 5.4 Consultants shall quote the rates in Indian National Rupees only.
- 5.5 Form FIN-2 is an acknowledgement that, in preparation and submission of the Technical and Financial Proposals, Consultants have:
 - (i) not taken any action which is or constitutes a corrupt or fraudulent practice as defined in Clause 1.7 of this RFP; and
 - (ii) agreed to allow the Client, at their option, to inspect and audit all accounts, documents, and records relating to the Consultant's Proposal and to the performance of the ensuing Consultant's Contract.
- 5.6 The rates to be quoted shall be on per kilometer basis and it shall include all costs / expenses and statutory taxes as applicable.

6. SUBMISSION, RECEIPT AND OPENING OF PROPOSALS

- 6.1 The original Proposal (Bid Security, Technical and Financial Proposals) shall contain no interlineations or overwriting, except as necessary to correct errors made by Consultants themselves. Any such corrections, interlineations or overwriting must be initialed by the person(s) who signed the Proposal.
- 6.2 An authorized representative of the Consultant shall initial all pages of the original copy of the Technical and Financial Proposal.
 - 6.2.1 A Proposal submitted by a Joint Venture shall be signed by all members so as to be legally binding on all members, or by an authorized representative who has a written power of attorney signed by each member's authorized representative.
 - 6.2.2 Agreement (in case of JV) has to be submitted along with the proposal.
- 6.3 Any modifications, revisions, interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Proposal.
- 6.4 The Technical Bid to be submitted on e-proc and a copy of the same to be provided in hard bound if there are discrepancies between the e-proc and the hard bound copy of the Technical Proposal, the e-proc will governs.
- 6.5 Technical Proposal: one (1) original along with Form Fin-1 & Fin-2 is to be uploaded along with Technical Proposal without mentioning the rate of Project. Rate is to be quoted on Financial Sheet only on e-proc site.
- 6.6 Proposals must be delivered at the indicated Client submission addresses on or before the time and date stated in the Data Sheet or any new date established by the Client according to provisions of Sub-Clause 2.2.

7. PROPOSAL EVALUATION**General**

Proposal will be evaluated on three stages:-
 Stage-1 Responsiveness
 Stage-2 Technical Evaluation
 Stage-3 Financial Evaluation

- 7.1 From the time the Proposals are opened to the time the contract is awarded, the Consultant should not contact the Client on any matter related to its Technical and/or Financial Proposal. Any effort by a Consultant to influence the Client in examination, evaluation, ranking of Proposals or recommendation for award of contract may result in rejection of the Consultant's Proposal.
- 7.2 The envelope I shall be opened first. If the bid security is not found to be in order then the proposal shall be treated as non responsive and shall not be evaluated further.

Evaluation of Technical Proposals

- 7.3 The Client's 'Consultants Selection Committee' (CSC) will be responsible for evaluation and ranking of Proposals received.
- 7.4 The CSC evaluates and ranks the Technical Proposals on the basis of Proposal's responsiveness to the TOR using the evaluation criteria and points system specified in the Data Sheet. Each Technical Proposal will receive a technical score.
- 7.4.1 A Proposal shall be rejected if it does not achieve the minimum technical mark of 700 from the maximum of 1,000 points.
- 7.5 Criteria for Responsiveness of proposal:- Responsiveness of proposal will be checked on the basis of following.
- (i) the Consultant that submitted the Proposal or one of its Associated Consultants belongs to one of the cases described in Sub-Clause 1.6(i) to (iv)
 - (ii) and failed to make a proper statement to that effect in the cover letter ; or
 - (iii) the Technical Proposal was submitted in the wrong format;
 - (iv) the Technical Proposal included details of costs of the services; or
 - (v) the Technical Proposal reached the Client after the submission closing time and date specified in the Data Sheet.
 - (vi) In case of JV proposal must be accompanied by JV Agreement MOU/ JV Agreement)
 - (vii) Details of work Experience of Firm must be submitted with proposal.
 - (viii) CV must contain Signatory of the Proposed Person and the authorized representative.
 - (ix) Proposal must be hard bound.
 - (x) Power of Attorney of the person signing the Document.
 - (xi) Proof of Experience/ Completion Certificate
- 7.6 After completion of the technical evaluation, the Client shall notify Consultants whose Proposals did not meet the minimum qualifying technical mark or Consultants whose Technical Proposals were considered non-responsive to the RFP requirements, indicating that their Financial Proposals will be returned unopened after completion of the selection process. The Client shall simultaneously notify, in writing Consultants whose Technical Proposals received a mark of 700 or higher overall technical score, indicating the date, time, and location for opening of Financial Proposals. (Consultants' attendance at the opening of Financial Proposals is optional).

8. PUBLIC OPENING AND EVALUATION OF FINANCIAL PROPOSALS

Public Opening of Financial Proposals

- 8.1 At the public opening of Financial Proposals, Consultant representatives who choose to attend will sign an Attendance Sheet.
- (i) The mark of each Technical Proposal that met the minimum mark of 700 will be read out aloud.
 - (ii) The Client's representative will open each Financial Proposal. Such representative will read out aloud the name of the Consultant and the total price shown in the Consultant's Financial Proposal. This information will be recorded in writing by the Client's representative.

Evaluation of Financial Proposals

- 8.2 The detailed contents of each Financial Proposal will be subsequently reviewed by the Client. During the examination of Financial Proposals, the Client's staff and any others involved in the evaluation process will not be permitted to seek clarification or additional information from any Consultant who has submitted a Financial Proposal.
- 8.3 The evaluated total price (ETP) for each Financial Proposal will be determined.
- 8.4 The score for each Financial Proposal is inversely proportional to its ETP and will be computed as follows:

$$Sf = 1,000 \times Fm/F$$

where:

Sf is the financial score of the Financial Proposal being evaluated

Fm is the ETP of the lowest priced Financial Proposal

F is the ETP of the Financial Proposal under consideration

The lowest evaluated Financial Proposal will receive the maximum score of 1,000 marks.

9. RANKING OF PROPOSALS

- 9.1 Following completion of evaluation of Technical and Financial Proposals, final ranking of the Proposals will be determined. **This will be done by applying a weight of 0.70 (or Seventy percent) and 0.30 (or Thirty percent) respectively to the technical and financial scores of each evaluated qualifying Technical and Financial Proposals and then computing the relevant combined total score for each Consultant.**
- 9.2 The final scores computed for each Technical and Financial Proposal is rounded to the nearest whole number. For purposes of rounding, 0.50 and above shall be rounded to the next higher whole number and 0.49 and below shall be rounded to the immediately preceding whole number. In the event two or more proposals have the same scores in the final ranking of proposals, the proposal with the highest technical score will be ranked first, the next highest technical score will be ranked second, and so forth.

10. Award of Contract

- 10.1 The technical and financial scores shall be added and the Contract will be awarded after to the agency which scores maximum points.
- 10.2 The selected Consultant is expected to commence the Assignment on the date and at the location specified in the Data Sheet.

11. Performance Security

The consultant will furnish within 10 days of the issue of Letter of Acceptance (LOA), an unconditional Bank Guarantee from the Bank Nationalized/Scheduled for an amount equivalent to **10%** of the total contract value to be received by him towards Performance Security valid for a period of **one year** beyond the date of completion of services in the format as mentioned in Appendix-I of this RFP Document. The Bank Guarantee (*shall be extendable till the completion of civil contract works*) will be released by BSRDCL, PATNA, BIHAR upon successful completion of civil contract and rectification of errors if any, found during implementation of the contract for civil work and satisfactory report by supervision consultant/PIU staff engaged by BSRDCL, PATNA.

12. Right to reject any or all Proposals

Notwithstanding anything contained in this NIT, the Authority reserves the right to accept or reject any Proposal and to annul the Selection Process and reject all Proposals, at any time without any liability or any obligation for such acceptance, rejection or annulment, and without assigning any reasons therefore.

13. The Consultant who will be awarded the work has to mobilize his team within 15 days from the date of commencement.
14. The Consultant who will be awarded the work has to establish local office at Patna within 15 days from the date of commencement and communicate the same to BSRDCL.

DATA SHEET

Consulting Services for preparation of Detailed Project Report "Improvement/Upgradation and Strengthening of 1 no. State Highways (SH-97), 1 no. Major District Roads (MDR) proposed to be upgraded with 2-Lane paved shoulder configuration and 1 High Level Bridge and its approach road, proposed for ADB Assistance under implementation of Bihar State Highways Project-IV (BSHP-IV)". (Approx. Length 74.615 km)

Clause Ref.		
	Method of Selection	QCBS
1.9	Validity of Technical and Financial Proposals	180 days
4.2 (i)	Type of Technical Proposal	F T P
2.1	Date, Time and place of Pre-Proposal Meeting	1108.2022 at 15:30 Hrs in BSRDCL HQ
5.7	Taxation	The rates quoted shall be all inclusive of all statutory taxes duties, cess, levies, etc. It shall also include the GST as applicable.
6.5	No of Copies of the proposal to be submitted	Technical Proposal: one (1) original Along with Form Fin-1 & Fin-2 is to be uploaded along with Technical Proposal without mentioning the amount of Project. Rate is to be quoted on Financial Sheet only on e-proc site.
6.6	Submission time and date of Technical and Financial Proposal	17:00 Hrs. on 24.08.2022
7.	Evaluation Criteria	As per Narrative Evaluation Criteria For Full Technical Proposal
8.1	Expected date of public opening of Financial Proposal	Shall be intimated once the technical evaluation is completed.
10.2	Expected date of Commencement of Services	Shall be intimated later
	Location	Patna, Bihar
General	Representative/Contact Person and Address of the Executing Agency	
	Chief General Manager Bihar State Road Development Corporation Ltd., Central Mechanical Workshop Campus, Near Airport, Sheikhpura, Patna-800014	Tel:-0612-2226711 Fax.:-0612-2226723 e-mail:- bsrldcltd@gmail.com
General	Name and Address of the Client where correspondence concerning this 'Request for Proposal' is to be sent: Chief General Manager Bihar State Road Development Corporation Ltd., Central Mechanical Workshop Campus, Near Airport, Sheikhpura, Patna-800014	
1.14	A Consulting firm is free to associate with any international consultants that he judge suitable for the services required for this project However their details and extent of participation should be mentioned in detail.	

**SUMMARY EVALUATIONS SHEET
FOR TECHNICAL PROPOSAL FOR PREPARATION OF DETAILED PROJECT REPORT**

EVALUATION CRITERIA	Maximum Weight	Firm (A)		Firm (B)		Firm (C)	
		Rating	Score	Rating	Score	Rating	Score
I. QUALIFICATION OF PROPOSER	200						
a. Experience in similar projects	150						
b. Experience in similar geographical areas	50						
II. APPROACH AND METHODOLOGY	200						
1. Understanding of objectives	20						
a. General Understanding	9						
b. Components Coverage	9						
c. Site Visit	2						
2. Quality of methodology	70						
3. Innovativeness	20						
4. Work Program	40						
5. Personnel Schedule	30						
6. Counterpart facilities	10						
7. Proposal Presentation	10						
III. PERSONNEL (AERA OF EXPERTISE)	600						
*Sr. Bridge Engineer cum Team Leader	100						
**Sr. Highway Engineer cum Team Leader	100						
Highway Engineer	60						
Pavement Specialist	60						
Bridge Engineer	60						
Traffic Engineer	60						
Materials cum Geo Technical Engineer	60						
Senior Survey Engineer	50						
Environment Specialist	50						
Resettlement and Rehabilitation Specialist	50						
Quantity Surveyor / Documentation Expert	50						
TOTAL	1000						
RANKING							

* For Package 12.

** For Package 9 & Package 13

RATING	Percentage
Excellent	100%
Very Good	90%
Above Average	80%
Average	70%
Below Average	50%
Not complying	0%

SCORE = Maximum Weight X Rating /100

Note :- The Minimum Technical Score Required to Pass is: 700 Points

Use Personnel Evaluation Sheet (attached) to determine ratings.

CONFIDENTIAL										
PERSONNEL EVALUATION SHEET FOR FULL TECHNICAL PROPOSAL (QCBS)										
Position		NAME		A		B		C		TOTAL SCORE (A+B+C)
				General Qualifications		Project-Related Experience		Full-Time Permanent Staff		
				20%		70%		10%		
				Rating	Score	Rating	Score	Rating	Score	
a.	Sr. Bridge Engineer Cum Team Leader									
b.	Sr. Highway Engineer Cum Team Leader									
c.	Highway Engineer									
d.	Pavement Specialist									
e.	Bridge Engineer									
f.	Traffic Engineer									
g.	Materials cum Geo Technical Engineer									
h.	Senior Survey Engineer									
i.	Environment Specialist									
j.	Resettlement and Rehabilitation Specialist									
k.	Quantity Surveyor / Documentation Expert									

**NARRATIVE EVALUATION CRITERIA
FOR FULL TECHNICAL PROPOSAL (FTP)**

I. QUALIFICATION OF PROPOSER (200 Points)

A. Experience in Preparation of Detailed Project Reports (150 points)

1. List only previous similar assignments successfully completed in the last 5 (Five)* years.
2. List only those assignments for which the Consultant was legally contracted by the Client as a company or was one of the joint venture partners. Assignments completed by the Consultant's individual experts working privately or through other consulting firms cannot be claimed as the relevant experience of the Consultant, or that of the Consultant's partners or sub-consultants, but can be claimed by the Experts themselves in their CVs. The Consultant should be prepared to substantiate the claimed experience by presenting copies of relevant documents and references if so requested by the Client.

Criteria: The extent and depth of experience of the firm and its associates in preparation of Detailed Project Report of Highway & Structural Bridges /ROBs/Flyovers/Elevated Roads that are similar to the requirement of the TOR in terms of Technical parameters, quantum of work and required inputs and financial parameters. Experience in Preparation of DPR of Bridges /ROBs/Flyovers/Elevated Road Projects completed in last 5 years only shall be considered. One Project shall be taken as a project of Elevated Roads/ Bridges /ROBs/Flyovers having length more than 500 m (Excluding Approaches). One Project shall only be considered when the value of services is more than 50 Lacs (For Package 12).

Factors to consider: Each reference project included in the technical proposal will be judged against the criteria established. Higher scores will be given to a firm, which has more experiences for projects with relevant nature. For an experience of Similar Work executed by the Consultant in JV/Association, the value of services shall be determined in the proportion of the Approximate Value of Services provided by your Firm (in INR) to the Approx. Value of Services for the assignment (In INR). (as per Technical proposal Form-II).

- The value of single work executed in a particular year shall be raised considering a price updating factor @ 10% per year and brought to the year of Bid submission. This shall be only for evaluation purpose. The Consultancy Firm shall mention the actual value of services with the year of completion.
- In case of Proposals submitted in JV/Association, Experience of only Lead partner related to Preparation of DPR of Bridge /ROB/Flyover/Elevated Road Projects completed in last 5 years shall be considered for Evaluation .

Note: 1. Year means the Financial Year (FY) starting from April to March.

2. In order to ensure the wider participation, the year of consideration shall be as under-

FY-2017-18

FY-2018-19

FY-2019-20

FY-2020-21

FY-2021-22 (April, 22 -One month prior to Bid submission month)

B. Experience in Similar Geographical Areas (50 points)

Criteria: Extent of experience in the India or similar geographical region taking in consideration elements such as population size, economic development stage and possibly other social factors.

Factors to consider: Higher scores will be given to a firm with better regional experiences.

II. APPROACH AND METHODOLOGY (200 Points)

Separate Technical Presentation shall be made by each responsive bidder at stipulated time and date in the form of PPT(Power Point Presentation).

A. Understanding of Objectives (20 points)

Criteria: General understanding of the project requirements; coverage of principal components as requested in TOR; and site visit assessment.

Factors to consider: The three following aspects will be considered:

General understanding	40%
Components coverage	40%
Site visit	20%

Maximum points will be given if all the three aspects are positively judged.

Note:- Marks against site visit shall be awarded if the consultant has submitted sufficient evidential documents such as site inventory photographs with chain age etc., for the same.

B. Quality of Methodology (70 points)

Criteria: The degree to which the presented written methodology/approach addresses the requirements of the TOR.

Factors to consider: Assessment of the inter-relationship of work program and methodology write-up. A consistent relationship is to be given maximum points.

C. Innovativeness/Comments on Terms of Reference (50 points)

Criteria: Suggestions, which could improve the quality of the project.

Factors to consider: Points will be given for workable suggestions proposed. No innovativeness will be given zero points.

D. Work Program (40 points)

Criteria: A work program showing graphical presentation of activities (bar chart); an organization chart showing the relationship of the Executing Agency and the Consultants.

Factors to consider: Work program will be assessed on logical sequence of events. The organization chart is to be assessed on the consultant's understanding of relationship between the consultant and the executing agency.

E. Personnel Schedule (30 points)

Criteria: Relationship between required person-months and proposed work program.

Factors to consider: The Personnel Schedule will be assessed based on phasing of activities of the work program and allocation and timing of expert's individual inputs. Total requirements close to estimated work requirements will be assessed as well as the appropriateness of time allocated to the task to be performed in terms of individual expertise. The balance between field time and home office time and the proposed number of trips will be checked.

F. Counterpart Personnel and Facilities (10 points)

Criteria: Requirement for counterpart personnel, office space, transportation, equipment and services.

Factors to consider: Reasonableness and completeness of requirements and understanding of local conditions will be assessed.

G. Proposal Presentation (10 points)

Criteria: Clarity and ease of assessment of the entire proposal (including material presentation).

Factors to consider: If all items requested in the invitation letter are covered in a clear and easily understandable form and the proposal is assembled in a professional manner, maximum points will be given.

III. PERSONNEL (600 Points)**Expertise**

Criteria: Separate assessment of each expert listed in the Request for Proposal. Each expert is to be evaluated against the tasks assigned in accordance with four main criteria:

- (i) general experience such as academic qualification and the number of years of related experience: (20%)
- (ii) project related experience based on the number of relevant projects implemented: (70%)
- (iii) For assessing full time permanent employment the personnel deployed who has worked for the current employer on a regular/permanent full-time basis continuously for the last 12 months, additional:
 - (a) 10% for team leadership (fixed)
 - (b) 10% for experts (fixed)

CONSULTANT

Section 3

TECHNICAL PROPOSAL STANDARD FORMS

TECHNICAL PROPOSAL (Form-I)

FROM:

TO:

_____	_____
_____	_____
_____	_____
_____	_____

Sir:

Subject: Hiring of Consultancy Service for

Regarding Technical Proposal

I/We _____ 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)

TECHNICAL PROPOSAL (Form-II)**FIRM'S REFERENCES****Relevant Services Carried out in the Last Five Years
Which Best Illustrate Qualifications**

The following information should be provided in the format below for each reference assignment completed in last five years for preparation of DPR 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 Employer as stated below:

Assignment Name:		Country:
#Length of Highway & Structure		Location within Country :
##Length of Elevated Road/ Bridge /ROB/Flyover project (excluding Length of Approaches) in Meter :		* Total no of Professional Staffs Months Provided by your firm:
Name and address of Employer :		*Total no of Professional Staffs Months Provided by your firm:
		*Total No. of professional Staff Months of the Assignment : `1
		*No. of of Professional Staff Months provided by JV/Associated Firm(s)
Start Date (Month / Year)	Completion Date (Month / Year)	**Approx. Value of Services for this assignment (In INR)
Name of Association Firm(s) if any :		Approximate Value of Services provided by Your Firm (In INR):
		Approximate Value of Services provided by JV/Associated Firm(s) (In INR):
Name of Senior Staff (Project Director / Coordinator, Team Leader) involved and functions performed:		
Narrative Description of Project :		
Description of Actual Services Provided by your Staff :		

* Total No of Professional staff Months of the Assignment must be equal to Total no of Professional Staffs Months Provided

by your firm + No. of of Professional Staff Months provided by JV/Associated Firm(s)

** Approximate value of Services Provided by Your Firm + Approximate value of Services Provided by JV/Association Firm(s) (in INR) =Approximate Value of Services for This assignment(In INR) .

For Package 9 & 13.

For Package 12.

Signature of Authorized Representative

(Certificate from Employer regarding experience should be furnished)

TECHNICAL PROPOSAL (Form-III)

APPROACH PAPER ON METHODOLOGY
PROPOSED FOR PERFORMING THE ASSIGNMENT

As per the details mentioned in the NARRATIVE EVALUATION CRITERIA FOR FULL TECHNICAL PROPOSAL (FTP).

Note: Marks will be deducted for writing lengthy and out of context approach and methodology for the assignment.

TECHNICAL PROPOSAL(Form-IV)
COMMENTS/ SUGGESTIONS OF CONSULTANT

On the Terms of Reference:

- 1.
- 2.
- 3.
- 4.
- 5.
- ..
- ..

On the Data, services and facilities to be provided by the Employer indicated in the Terms of Reference.

- 1.
- 2.
- 3.
- 4.
- 5.

TECHNICAL PROPOSAL(Form-V)
Composition of the Team Personnel and the task
Which would be assigned to each Team Member

I. Technical/Managerial Staff

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

II. Support Staff

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

TECHNICAL PROPOSAL(Form-VI)**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)**
6. Membership of Professional Societies: _____
- 4 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, and 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 Employer 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 Road/Bridge/Flyover/ROB projects: _____ Yrs
 - ii) Responsibilities held: i) _____ Yrs.
ii) _____ Yrs.
iii) _____ Yrs.
 - iv) Relevant Experience: _____ Yrs.
 - C) Permanent Employment with the Firm (Yes/No):

If yes, how many years : _____

If no, employment details : _____

Arrangement with the firm?: _____

Certification :

- 1 *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*
- 2 I, the undersigned, certify that to the best of my knowledge and belief, this bio-data correctly describes my qualification and 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.

TECHNICAL PROPOSAL (Form-VII)

WORK PROGRAM AND TIME SCHEDULE FOR KEY PERSONNEL

MONTHS (in the Form of Bar Chart)

Sl. No.	Name	Position	Report Due/ Activities	Months								Number of Months
1												Sub Total (1)
2												Sub Total (2)
3												Sub Total (3)
4												Sub Total (4)
...												
....												

Field Full :

Part Time :

Reports Due:

Activities :

Duration :

CONSULTANT

TECHNICAL PROPOSAL (Form-VIII)**A. FIELD INVESTIGATION**

(1st, 2nd etc. are months from the date of assignment)

S. N	Item of Work / Activities	Months							
1									
2									
3									
..									
..									

B. COMPLETION AND SUBMISSION OF REPORTS

S.No.	Reports	Programme
	(As per TOR)	
1		
2		
3		
4		
..		
..		

TECHNICAL PROPOSAL (Form-IX)

Format for furnishing additional information as per clause 10.1 (1) of TOR

S. No.	Details of activity	<i>To be Carried out / prepared by</i> (Name/Designation)	To be Checked/ Verified by (Name/Designation)
1	Fixation of all TBM's		
2	Physical surveys (give separate details for various studies)		
3	Traffic studies (give separate details for various studies)		
4		
5		
6		

(in column 2 all relevant activities since inception to the completion of feasibility study and project preparation work should be covered)

CONSULTANT

Section- 4
FINANCIAL PROPOSAL STANDARD FORMS
FORM FIN-1
FINANCIAL PROPOSALS

From: _____

To:
 Chief General Manager
 Bihar State Road Development Corporation
 Ltd., Patna

Sir:

Subject: Hiring of Consultants’ Services for feasibility study and preparation of detailed project report for

Regarding: Price Proposal

I/We _____ Consultant/consultancy firm herewith enclose Price Proposal for selection of my/our firm/organization as Consultant for feasibility study and preparation of detailed project for following Road project.

We have read and understood all the terms and conditions mentioned in this request for proposal and agree to abide by them. In confirmation to the terms and conditions mentioned in the RFP we quote rates including all taxes, cess, duties, etc as follows:

Quoted Rate in Rs /-	In figures	In words
I/ We hereby submit our RFP and offer a Rate of Rs.----- (Rupees-----only) per KM Road Project, (Pkg-09 & 13) inclusive of all Indian taxes(direct and indirect taxes) including GST and other applicable Taxes		
I/ We hereby submit our RFP and offer a Rate of Rs.----- (Rupees-----only) Lump sum for the Bridge Project including Approaches, (Pkg- 12) inclusive of all Indian taxes(direct and indirect taxes) including GST and other applicable Taxes		

Yours faithfully,

Signature_____

Full Name_____

Designation_____

Address_____

(Authorized Representative)

FORM FIN-2

DECLARATION

Acknowledgement of Compliance with EXTERNAL FUNDING AGENCY’S Guidelines

I, _____ (name and position of authorized signatory) duly authorized by _____ (name of Consulting firm) (“Consultant”) hereby certify on behalf of the Consultant and myself that information provided in the Technical and Financial Proposals (collectively “Proposals”) submitted by the Consultant is true, correct and accurate to the best of my knowledge and belief. I further certify that on behalf of the Consultant that (i) the Proposals have been prepared and submitted in compliance with the terms and conditions set forth in the *External Funding Agency Guidelines on the Use of Consultants by External funding agency and its Borrowers (Guidelines)*, (ii) that the Consultant has not taken any action which is or constitutes a corrupt and fraudulent practice as defined in External Funding Agency anti-corruption policy and (iii) that the Consultant agrees to allow the Client, to inspect and audit all accounts, related documents and records relating to the Proposals.

I further certify on behalf of the Consultant that, if selected to undertake consulting services in connection with the Project, we shall carry out such services in continuing compliance with the terms and conditions of the Guidelines.

Authorized Signatory

For and on behalf of the Consultant

Date: _____

Section-5

Preparation of Detailed Project Report "Improvement/Upgradation and Strengthening of 1 no. State Highways (SH-97), 1 no. Major District Roads (MDR) proposed to be upgraded with 2-Lane paved shoulder configuration and 1 High Level Bridge and its approach road, proposed for ADB Assistance under implementation of Bihar State Highways Project-IV (BSHP-IV)".

Terms of Reference (TOR)

1. General

- 1.1 To get rid of the frequent and congestion free Traffic, Government of Bihar intends to construct **"Improvement/Upgradation and Strengthening of 1 no. State Highways (SH-97), 1 no. Major District Roads (MDR) proposed to be upgraded with 2-Lane paved shoulder configuration and 1 High Level Bridge and its approach road, proposed for ADB Assistance under**
- 1.2 Bihar State Road Development Corporation (BSRDCL) (the Employer) invites proposals for preparation of Detailed Project Report for the proposed project as mentioned in the RFP.
- 1.3 The appointed consultants shall be expected to adhere to high level of quality standards and to the stipulated time schedule.

2. Objective

- 2.1 The main objective of the consultancy service is to establish the technical, economical, and financial viability of the projects with due consideration to environmental and social safeguards and prepare / update detailed project reports for the project enumerated.
- 2.2 The Project report would inter-alia include detailed design of at grade Road/Elevated Road, Flyover, viaduct, approaches and cross drainage structures, quantities of various items, detailed G.A. drawings, detailed cost estimates, schedules, and documents required for tendering the project on commercial basis through competitive bidding.
- 2.3 The DPR consultant should ensure detailed project preparation incorporating aspects of value engineering, quality audit and safety audit requirement in design and implementation. The consultant is expected to make effective use of modern technology for carrying out accurate ground surveys and preparation of digital data for design of the proposed project.

3. Scope of Services

The broad scope of work is as under, and is followed by detailed terms of reference in the next section.

- 3.1 List of road for which the DPR are to be prepared is annexed as Appendix A.
- 3.2 Road safety audit shall be carried out for each road project to identify areas of major concern, including black spots, and measures to be taken for improving detailed engineering design with respect to road safety.
- 3.3 The rehabilitation and widening proposals shall be within the existing right of way. However, those sections/ locations would be identified where the available right of way is inadequate i.e. less than 12 mtr. or would be inadequate after alignment corrections, constructions of bridges and ROB's, improvement of intersections including provision of grade separators etc. These should be included as per requirements and consultant has to prepare Land acquisition plan/Land requisition plan for these section only. In case of

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Land acquisition, the consultant shall be responsible for verification of document and notification is required under section 4/6 under state LA Act /3a & 3A under NH Act-1956.

- 3.4 The option to collect toll fees from the road users for the roads improved should be explored during the study.
- 3.5 Each project is to be designed, constructed, operated, maintained, and monitored in compliance with the existing environmental laws and regulations of Government of India and Bihar, and External Funding Agency Environmental Assessment Guidelines, as may be amended from time to time. Accordingly, the consultant will prepare for every project the reports on environmental aspects including Initial Environmental Examination and Environmental Monitoring and Management Plans (EMMPs) as per External Funding Agency guidelines. The Consultant will also assist BSRDCL, PATNA, BIHAR in discussions and presentations to Ministry of Environment and Forest for obtaining the necessary clearances.
- 3.6 An initial poverty and social assessment (IPSA) will be conducted. Social risks and vulnerabilities as a result of the project will be identified during IPSA, especially related to Gender and increased transmission of HIV/AIDS and Human trafficking etc. An IPSA report along with appropriate mitigation plan to address social issues as described above will be prepared.

The screening and impact categorization checklists for involuntary resettlement (IR) and indigenous people (IP) shall be prepared together with other required project selection procedures, for review and approval of project for implementation under BSRSDP. Based on the screening of IR and IP impacts and categorization and appropriate resettlement framework, resettlement plans for each subproject, Indigenous People's Development Framework (IPDF) indigenous people's development plans (if required) or specific actions to address IP issues will be incorporated in sub-project Resettlement plans prepared in accordance with External Funding Agency Policy on Involuntary Resettlement (1995), Handbook on Resettlement – A Guide to Good Practice, External Funding Agency Policy on Indigenous People (1998) and External Funding Agency Handbook on Poverty and Social Analysis for approval.

- 3.7 In case of Railway Over Bridges getting approval of all designs and drawings including GAD and detail engineering designs and drawings from the Railways will be provided and responsibility taken by the consultant. However, if Railways requires proof checking of the drawings prepared by the consultants, the same will be got done by the consultant and payment to the proof consultant shall be made by BSRDCL, PATNA, BIHAR directly. In this connection necessary supporting letter shall be issued by BSRDCL on the request of consultant.
- 3.8 The cost estimates shall also incorporate the estimates for shifting of utilities, to the extent identifiable on ground within ROW based on discussion with the concerned local authorities. In this connection, the BSRDCL, PATNA, BIHAR shall provide the necessary supporting letters and any official fees.
- 3.9 The consultant should ensure detailed project preparation incorporates value engineering, quality audit and safety requirements in design and the consultant will submit quality assurance plan before starting the preparation of Detailed Project Report.
- 3.10 The entire scope of services would, inter-alia, include the items mentioned in the Letter of Invitation and the detailed TOR.
- 3.11 All 'good for construction' drawings shall be prepared by the consultant.
- 3.12 The maintenance requirements would be identified and evaluated for a period of 3 years after rehabilitation, together with the bill of quantities and the cost estimates and incorporated in the bid documents.

4. Detailed Terms of Reference

4.1 Primary Tasks

General Scope of Services shall cover but not be limited to the following major tasks:

- (i) Review of all available reports and published information about the project road and the project influence area;
- (ii) Environmental, poverty and social impacts, including those related to cultural properties, indigenous people natural habitants, involuntary resettlement etc.;
- (iii) Public consultation, including consultation with Communities located along the road, NGOs working in the area, other stake-holders and relevant Govt. deptts at all the different stages of assignment (such as inception report stage, interim report stage, detailed project report (Part-I) stage and detailed project report (Part-II) stage);
- (iv) Detailed reconnaissance;
- (v) Identification of possible improvements in the existing alignment and bypassing congested locations with alternatives.
- (vi) Traffic studies including traffic surveys and axle load survey and demand forecasting for next thirty years;
- (vii) Inventory and condition surveys for road;
- (viii) Inventory and condition surveys for bridges, cross-drainage structures and drainage provisions;
- (ix) Detailed topographic surveys using Total Stations and GPS;
- (x) Pavement investigations;
- (xi) 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;
- (xii) Identification of sources of construction materials;
- (xiii) Road safety audit to identify areas of major concern, including black spots, and measures to be taken for improving detailed engineering design with respect to road safety
- (xiv) Preliminary proposal for rehabilitation / widening including shoulder composition and cross-section details
- (xv) Detailed design for rehabilitation / widening of road, its x-sections, horizontal and vertical alignment and design of embankment of height more than 6m and also in poor soil conditions and where density consideration require, even lesser height embankment; detailed design for rehabilitation /widening/ reconstruction of bridges, cross-drainage structures, preparation of GAD and detailed drawings for bridges cross-drainage structures and underpasses etc. In case of reconstruction geotechnical investigations including bore holes, hydraulic surveys etc shall be carried out by the consultant.
- (xvi) Identification of the type and the design of intersections;
- (xvii) Design of complete drainage system and disposal point for storm water;
- (xviii) Value analysis / value engineering and project costing;
- (xix) Economic analysis;
- (xx) Selection of projects for Externally added funding in accordance with selection criteria and approval procedures (Supplement I);
- (xxi) 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 and planted;
- (xxii) Preparation of detailed project report, cost estimate, good for construction drawings, rate analysis, detailed bill of quantities;
- (xxiii) Bid documents appropriate for single stage bidding/two stage bidding based on externally funded standard bidding documents for execution of civil works including provisions for 3 years maintenance by the civil contractor;
- (xxiv) Tie-in of on-going/sanctioned works of MORT&H/RCD BIHAR/ other agencies;
- (xxv) Preparation of initial Poverty and Social Assessment Reports (IPSA), resettlement framework, preparation of resettlement plans for each sub-project as per External Funding Agency guidelines and Govt. of India R & R Policy.
- (xxvi) Preparation of Initial Poverty and Social Assessment Reports (IPSA), IR checklist resettlement framework, preparation of resettlement plans for each sub-project (if all the subprojects/roads are not connected to each other but are not connected to each other but

are scattered all over the state) as per External Funding Agency guidelines, Govt. of India National Policy on Resettlement and Rehabilitation for project (NPRR 2004); and Land Acquisition Act (1894).

(xxvii) Preparation of IP checklist, IPDF, IPDP (if required) or inclusion of specific actions to address IP issues in resettlement plans; preparation of mitigation plans to address other social risks and vulnerabilities related to HIV/AIDS transmission, Human trafficking, gender etc.

4.2 While carrying out the field studies, investigations and design, the development plans being implemented or proposed for future implementation by the local bodies, should be taken into account. Such aspect should be clearly brought out in the reports and drawings.

4.3 The consultant shall plan the arboriculture along the highway.

4.4 Standards and Codes of Practices

4.4.1 All activities related to field studies, design and documentation shall be done as per the latest guidelines/ circulars of MORTH and relevant publications of the Indian Roads Congress (IRC) and Bureau of Indian Standards (BIS). For aspects not covered by IRC and BIS, international standard practices, such as, British and American Standards may be adopted. The Consultants, upon award of the Contract, may finalise this in consultation with BSRDCL, PATNA, BIHAR and reflect the same in the inception report.

4.4.2 All notations, abbreviations and symbols used in the reports, documents and drawings shall be as per IRC:71-1977.

4.5 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, analyses and documentation activities. The draft detailed QAP Document must be discussed and finalised with the concerned BSRDCL, PATNA, BIHAR officers immediately upon the award of the Contract and submitted as part of the inception report.

4.6 Review of Data and Documents

The Consultants shall collect the available data and information relevant for the Study. The consultant will also summarize the analysis of the collected data available. 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) Hydraulic data, drawings and details of existing bridges;
- (vii) Detailed of sanctioned / on-going works on the stretch sanctioned by MORT&H/ other agencies for Tie-in purposes;
- (viii) Survey and evaluation of locally available construction materials;
- (ix) Historical data on classified traffic volume (preferably for 5 years or more);
- (x) Origin-destination and commodity movement characteristics; if available;
- (xi) Speed and delay characteristics; if available;
- (xii) Commodity-wise traffic volume; if available;
- (xiii) Accident statistics; and,
- (xiv) Vehicle loading behaviour (axle load spectrum), if available;

- (xv) Type and location of existing utility services (e.g. Fibre Optical Cable, O/H and U/G Electric, Telephone line, Water mains, Sewer, Trees etc.)
- (xvi) Environmental setting and social baseline of the project.

4.7 Traffic Survey

4.7.1 Number and Location of Survey Stations

4.7.1.1 The type of traffic surveys and the minimum number of survey stations shall normally be as under, unless otherwise specifically mentioned.

Sl. No.	Description	Number of Survey Stations per 100 km (or minimum numbers for shorter lengths)
1.	Classified Traffic Volume Count	3 (2)
2.	Origin-Destination and Commodity Movement Characteristics	Minimum of 2 per 200 km. (2)
3.	Axle Loading Characteristics	2(1)
4.	Intersection Volume Count	All Major Intersection
5.	Speed-Delay Characteristics	Project Road Section

4.7.1.2 The number of survey locations indicated in the table above are indicative only. The Consultants shall, immediately upon award of the work, submit to BSRDCL, PATNA, BIHAR proposals regarding the total number as well as the locations of the traffic survey stations as part of inception report. Suitable maps and charts should accompany the proposals clearly indicating the rationale for selecting the location of survey stations.

4.7.1.3 The methodology of collection and analysis of data, number and location of traffic survey stations shall be finalised in consultation with Coordination Committee /BSRDCL,PATNA,BIHAR

4.7.2 Classified Traffic Volume Count Survey

4.7.2.1 The classified traffic volume count surveys shall be carried out for 7 days (continuous, direction-wise) at the selected survey stations. The vehicle classification system 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	Mini Bus Standard Bus	
LCV	LCV-Passenger LCV-Freight	
Truck	MCV : 2-Axle Rigid Chassis HCV : 3-Axle Rigid Chassis	
	MAV Semi Articulated	
	Articulated	

4.7.2.2 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.

- 4.7.2.3 The consultants 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 BSRDCL, PATNA, BIHAR shall be suitably explained.

4.7.3 Origin-Destination and Commodity Movements Surveys

- 4.7.3.1 The Consultants shall carry out 1-day (24 hour, both directions) O-D and Commodity Movement Surveys at locations finalised in consultation with BSRDCL, PATNA, 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 locations of the O-D survey and Commodity Movement surveys shall normally be same as for the classified traffic count stations.
- 4.7.3.2 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.
- 4.7.3.3 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 e.g. traffic band figures.
- 4.7.3.4 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 widening of existing roads / construction of bypasses.
- 4.7.3.5 The distribution of lead and load obtained from the surveys should be compared with those derived from the axle load studies.
- 4.7.3.6 The commodity movement data should be duly taken into consideration while making the traffic demand estimates.

4.7.4 Turning Movement Surveys

- 4.7.4.1 The turning movement surveys for estimation of peak hour traffic for the design of major intersections shall be carried out for the Study. The details regarding composition and directional movement of traffic shall be furnished by the Consultant.
- 4.7.4.2 The methodology for the surveys shall be as per IRC: SP: 41-1994. The details including location and duration of surveys shall be finalized in consultation with BSRDCL, PATNA, 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.
- 4.7.4.3 The data derived from the survey should be analysed 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.

4.7.5 Axle Load Surveys

- 4.7.5.1 Axle load surveys in both directions shall be carried out at suitable location(s) in the project road stretch on a random sample basis normally for trucks only (both empty and loaded trucks) for 2 normal days - (24 hours) at special count stations to be finalised in consultation with BSRDCL,PATNA,BIHAR. However, a few buses may be weighed in order to get an idea about their loading behaviour. 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.
- 4.7.5.2 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 methodology including the data formats and the instrument type to be used shall be finalised before taking up the axle load surveys.
- 4.7.5.3 The axle load data should be collected axle configuration-wise. The number of equivalent standard axles per truck shall be calculated on the basis of results obtained. The results of the survey should bring out the VDF for each truck type (axle configuration, if the calculated VDF is found to be below the national average, then national average shall be used. Furthermore, the data from axle load surveys should be analysed to bring out the Gross Vehicle Weight (GVW) and Single Axle Load (SAL) Distributions by truck type (axle configuration).
- 4.7.5.4 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.

4.7.6 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 analysed to identify sections with typical traffic flow problems and congestion. The objective of the survey would be to suggest for future action 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, overpasses, grade-separated intersections and service roads

4.7.7 Pedestrian / Animal Cross Traffic Surveys

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

4.7.8 Truck Terminal 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.

4.8 Traffic Demand Estimates

- 4.8.1 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 behaviour should also be taken into account while working out the traffic demand estimates.

- 4.8.2 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.
- 4.8.3 The traffic demand estimates shall be done for the period, 2011-2041. 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.
- 4.8.4 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.
- 4.8.5 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 with sound and explicit assumptions, based on studies in similar geographical areas in the past.
- 4.8.6 The traffic forecasts shall also be made for both diverted and generated traffic. The traffic forecast shall also be made, taking into account the effect of toll, in case the toll collection is considered (Para 3.4)
- 4.8.7 Overall traffic forecast thus made shall form the basis for the design of each pavement type and other facilities/ancillary works.

4.9 Engineering Surveys and Investigations

4.9.1 Reconnaissance and Alignment

- 4.9.1.1 The Consultants should make an in-depth study of the available land width (ROW), topographic maps, and other available relevant information collected by them concerning the existing alignment. Consultant has to arrange the required maps and the information needed by him from the potential sources. BSRDCL, PATNA, BIHAR shall provide introductory/support letters, if required.
- 4.9.1.2 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-à-vis, scheme for the widening of the existing road;
 - (iv) Realignment requirements including the provision of bypasses, ROBs / underpasses/ overpasses and subways for pedestrian crossings with possible alignment alternatives;
 - (v) Preliminary identification of improvement requirements including treatments and measures needed for the cross-roads;

- (vi) Traffic pattern and preliminary identification of traffic homogenous links;
- (vii) Sections through congested areas;
- (viii) Inventory of major aspects including land width, terrain, pavement type, carriageway type, bridges and structures (type, size and location), intersections (type, cross-road category, location) urban areas (location, extent), geologically sensitive areas, environmental features;
- (ix) Critical areas requiring detailed investigations; and,
- (x) Requirements for carrying out supplementary investigations;
- (xi) Soil (textural classifications) and drainage conditions;
- (xii) Type and extent of existing utility services along the alignment (within ROW).

4.9.1.3 The data derived from the reconnaissance surveys are normally utilised 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. The projects are to be designed for rehabilitation and upgrading within the ROW. The detailed surveys and investigation should normally extend a minimum of 30 m beyond either side of the centre line of the proposed divided carriageway or land boundary whichever is more.

4.9.1.4 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.

4.9.1.5 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 BSRDCL, PATNA, BIHAR's comments. The data and the charts should also accompany the rationale for the selection of traffic survey stations.

4.9.2 Topographic Surveys

4.9.2.1 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.

4.9.2.2 The carrying out of topographic surveys will be one of the most important and crucial field tasks under the project. The detailed field surveys shall be carried out using high precision instruments i.e. Total stations. The data from the topographic surveys shall be available in (x, y, z) format for use in a sophisticated digital terrain model (DTM). The Consultants would be fully responsible for any inaccuracy in surveys.

4.9.2.3 The detailed field surveys would essentially include the following activities:

- (i) Topographic Surveys along the Existing Right of Way (ROW): Running a continuous open Traverse along the existing road and realignments, wherever required, and fixation of all cardinal points such as horizontal intersection points (HIP's), centre points and transit points etc. and properly referencing the same with a pair of reference pillars fixed on either side of the centre-line at safe places within the ROW.

- (ii) Collection of details for all features such as structures (bridges, culverts etc.) utilities, existing roads, electric and telephone installations (both O/H as well as underground), huts, buildings, fencing and trees (with girth greater than 0.3 metre) oil and gas lines etc. falling within the extent of survey.

4.9.2.4 The width of survey corridor will generally be as given under:

- (i) The width of the survey corridor should taken into account the layout of the existing alignment including the extent of embankment and cut slopes and the general ground profile. While carrying out the field surveys, the widening scheme (i.e. right, left or symmetrical to the centre line of the existing carriageway) should be taken into consideration so that the topographic surveys cover sufficient width beyond the centre line of the proposed carriageway. Normally the surveys should extend a minimum of 30 m beyond either side of the centre line of the proposed divided carriageway or land boundary whichever is more.
- (ii) Where existing roads cross the alignments, the survey will extend a minimum of 100 m either side of the road centre line and will be of sufficient width to allow improvements, including at grade intersection to be designed.

4.9.2.5 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 15 cm X 45 cm shall be cast in RCC of grade M 15 with a nail fixed in the centre of the top surface. The reference pillar shall be embedded in concrete upto a depth of 30 cm with CC M10 (5 cm wide all around). The balance 15 cm above ground shall be painted yellow. The spacing shall be 250m apart, incase Bench Mark Pillar coincides with Reference Pillar, only one of the two need be provided.
- (ii) Establishing Bench marks at site connected to GTS Bench marks at a interval of 250 metres on Bench mark pillar made of RCC as mentioned above with RL and BM No. marked on it with red paint

4.9.2.6 **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 20 m interval, at the locations of curve points, small streams, intersections and at the locations of change in elevation.
- (ii) Cross sections at every 50 m interval in full extent of survey covering sufficient number of spot levels on existing carriageway and adjacent ground for profile correction course and earth work calculations. Cross sections shall be taken at closer interval at curves.
- (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 as per recommendations contained in IRC Special Publication No. 13 (Guidelines for the Design of Small Bridges and Culverts) and IRC:5-1998 (“Standard Specifications & Code of Practice for Road Bridges, Section 1 - General Features of Design” for proposal for new bridges / reconstruction of existing bridges.

4.9.2.7 Details of utility Services and Other Physical Features

4.9.2.7.1 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.

4.9.2.7.2 The information collected during reconnaissance and field surveys shall be shown on a strip plan so that the proposed improvements can be appreciated and, utility removals of each type and tree cutting 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.

4.9.3 Road and Pavement Investigations

The Consultants shall carry out detailed field studies in respect of road and pavement features. The data collected through road inventory and pavement investigations should be sufficient to meet the input requirements of HDM-IV.

4.9.3.1 Road Inventory Surveys

4.9.3.1.1 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) Carriageway width, surfacing type @ every 500m and every change of feature whichever is earlier;
- (iv) Shoulder surfacing type and width @ every 500m and every change of feature whichever is earlier;
- (v) Sub-grade / local soil type (textural classification) @ every 500m and every change of feature whichever is earlier;
- (vi) Horizontal curve; vertical curve; design speed
- (vii) Road intersection type and details, at every occurrence;
- (viii) Retaining structures and details, at every occurrence;
- (ix) Location of water bodies (lakes and reservoirs), at every occurrence; and,
- (x) Height of embankment respect of HFL or depth of cut @ every 200m and every change of feature whichever is earlier.
- (xi) Land width i.e. ROW;
- (xii) Culverts, bridges and other structures (type, size, span arrangement and location); HFL & Soil Investigation data
- (xiii) Roadside arboriculture;
- (xiv) Existing utility services on either side within ROW;
- (xv) General drainage conditions
- (xvi) Inventory of all road side facilities for the public including educational, health, communication facilities and road user based facilities such as tea shops, dhaba, vehicle service shops etc

4.9.3.1.2 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.

4.9.3.2 Pavement Investigation

4.9.3.2.1 Pavement Composition

1. The data concerning the pavement composition may be already available with the BSRDCL. However, the consultants shall make trial pits to ascertain the pavement composition. The test pit interval will be as per Para 4 below.
2. For each test pit, the following information shall be recorded:
 - (i) test pit reference (Identification number, location):
 - (ii) pavement composition (material type and thickness); and
 - (iii) subgrade type (textural classification) and condition (dry, wet)

4.9.3.2.2 Road and Pavement Condition Surveys

1. Detailed field studies shall be carried out to collect road and pavement surface conditions. The data should generally cover:
 - (i) pavement condition (surface distress type and extent);
 - (ii) shoulder condition;
 - (iii) embankment/Subgrade condition; and
 - (iv) drainage condition
 - a. Pavement
 - cracking (narrow and wide cracking), % of pavement area affected;
 - ravelling, % of pavement area affected;
 - potholing, % of pavement area affected;
 - edge break, length (m); and,
 - rut depth, mm
 - Settlement in road
 - b. Shoulder
 - Paved: Same as for pavement
 - Unpaved: material loss, rut depth/width and corrugation,
 - Edge drop, mm.
 - c. Embankment
 - general condition; and
 - extent of slope erosion
 - d. Drainage
 - General condition
 - Connectivity of drainage turnouts into the natural topography
 - Condition in cut sections
 - Condition at high embankments
2. 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.
3. 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.

4. The shoulder and embankment conditions shall be evaluated by visual means and the existence of distress modes (cuts, erosion marks, failure, drops) and extent (none, moderate, frequent and very frequent) of such distress manifestations would be recorded.
5. For sections with severe distresses, additional investigations as appropriate shall be carried out to determine the cause of such distresses.
6. Middle 200m could be considered as representative sample for each one km. of road and incase all other things are considered similar.

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.

4.9.3.2.3 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 direction, as applicable for the configuration of individual projects.
- (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.

4.9.3.2.4 Pavement Structural Strength

- (i) The Consultants shall carry out structural strength surveys for existing pavements using Benkelman Beam Deflection technique in accordance with the CGRA 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:
 1. mainline testing; and,
 2. control section testing.
- (iii) The deflection tests for the mainline shall be carried out at every 500 m along the road sections covered under the study. The control section testing shall involve carrying out deflection testing for each 100 m long homogenous road segment along the road sections. The selection of homogenous segment shall be based on the data derived from pavement condition surveys. The total length of such homogenous segments shall not be less than 100 m per kilometre. The deflection measurements for the control section testing should be at an interval of not more than 10 m.
- (iv) Test pits shall be dug at every 500 m and also along each homogeneous road segment to obtain pavement composition details (pavement course, material type and thickness) so as to be able to study if a correlation exists between deflection and composition. If so, the relationship may be used while working out the overlay thickness for the existing pavement.
- (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 BSRDCL, PATNA,

BIHAR the scheme describing the testing schedule including the interval. The testing scheme shall be supported by data from detailed reconnaissance surveys.

- (vi) In case, the Consultants wish to use any acceptable method(s) other than Benkelman Beam deflection technique for the evaluation of pavement strength, 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 BSRDCL,PATNA,BIHAR. The sources of such methods should be properly referenced.

4.9.3.3 Subgrade Characteristics and Strength

- 4.9.3.3.1 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).
- 4.9.3.3.2 The data on soil classification and mechanical characteristics for soils along the existing alignments may already be available with the PWD. The testing scheme for the widening of existing road within the ROW is, therefore, proposed that 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.
- 4.9.3.3.3 The testing for subgrade soil shall include:
- (i) in-situ density and moisture content at each test pit
 - (ii) field CBR using DCP at each test pit
 - (iii) characterisation (grain size and Atterberg limits) at each test pit and,
 - (iv) laboratory moisture-density characteristics (modified AASHTO compaction);
 - (v) laboratory CBR (unsoak and 4-day soak compacted at three energy levels) and swell.
 - (vi) Identification of Subgrade soil Borrow Area
- 4.9.3.3.4 For problematic soils, the testing shall be more rigorous. The characteristics with regard to permeability and consolidation shall also be determined for these soils. The frequency of sampling and testing of these soils shall be finalised in consultation with the BSRDCL, PATNA, BIHAR officers after the problematic soil types are identified along the road sections. Identification of Boggy marshy area if any.

4.9.4 Investigations for Bridges and Structure

4.9.4.1 Inventory of Bridges, Culverts and Structures

The Consultants shall make an inventory of all the structures (bridges, ROBs, culverts, etc.) along the road under the project. The inventory for the bridges, and ROBs shall include the parameters required as per the guidelines of IRC-SP:35-1990. The inventory of culverts shall be presented in a tabular form covering relevant physical and hydraulic parameters

4.9.4.2 Hydraulic and Hydrological Investigations

- 4.9.4.2.1 The Consultants shall collect information on high flood level (HFL), low water levels (LWL), discharge velocity etc. from available past records, local inquiries and visible signs, if any, on the structural components and

embankments. Local inquiries shall also be made with regard to the road sections getting overtopped during heavy rains.

4.9.4.2.2 The Consultants shall make a desk study of available data on topography (topographic maps, stereoscopic aerial photography), storm duration, rainfall statistics, top soil characteristics, vegetation cover etc. so as to assess the catchment areas and hydraulic 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.

4.9.4.2.3 For bridges and cross drainage structures having inadequate waterway, history of overtopping and are proposed for reconstruction, the detailed 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:5-1998 (“Standard Specifications & Code of Practice for Road Bridges, Section I General Feature of Design”).

4.9.4.3 Condition Surveys for Bridges, Culverts and Structures

4.9.4.3.1 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; 35-1990. The condition and structural assessment survey of the bridges / culverts / structures shall be carried out by senior experts of the Consultants.

4.9.4.3.2 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.

4.9.4.4 Geo-technical Investigations and Sub-Soil Exploration

4.9.4.4.1 The Consultants shall carry out geo-technical investigations and sub-surface explorations for the proposed new bridges / bridges proposed for reconstruction / Road over bridges/underpasses/ overpasses 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.N.	Description	Location of Boring
1.	Over all length = 6 – 30 m	One abutment location
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.

4.9.4.4.2 The deviation(s), if any, by the Consultants from the scheme presented above should be got approved by BSRDCL, PATNA, BIHAR

4.9.4.4.3 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 BSRDCL, PATNA, BIHAR officers.

- 4.9.4.4.4 Sub-soil investigations will be done as per IRC 78-2000.
- 4.9.4.4.5 The scheme for the borings locations and the depth of boring shall be prepared by the Consultants and submitted to BSRDCL, PATNA, BIHAR for approval. These may be finalized in consultation with BSRDCL, PATNA, BIHAR.
- 4.9.4.4.6 The sub-soil exploration and testing should be carried out through the Geo-technical Consultants empanelled by the MORT&H. The soil testing reports shall be in the format prescribed in relevant IRC Codes.

4.9.4.5 Material Investigations

- 4.9.4.5.1 The Consultants shall identify sources (including use of fly-ash/ slag), quarry sites and borrow areas, undertake field and laboratory testing of the materials to determine their suitability for various components of the work and establish quality and quantity of various construction materials and recommend their use on the basis of techno-economic principles. The Consultants shall prepare mass haul diagram for haulage purposes giving quarry charts indicating the location of selected borrow areas, quarries and the respective estimated quantities.
- 4.9.4.5.2 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.
- 4.9.4.5.3 Environmental restrictions, if any, and feasibility of availability of these sites to prospective civil works contractors, should be duly taken into account while selecting new quarry locations.
- 4.9.4.5.4 The Consultants shall make suitable recommendations regarding making good the borrow and quarry areas after the exploitation of materials for construction of works.
- 4.9.4.5.5 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.

4.9.5 Road Safety Audit

- 4.9.5.1** Road safety audit shall be carried out for each road project to identify areas of major concern, including black spots, and measures to be taken for improving detailed engineering design with respect to road safety. The audit should be in line with the EXTERNAL FUNDING AGENCY's Road Safety Audit for Road Projects – An Operational Toolkit. Sample checklists for road safety audit are at Supplement II.
- 4.9.5.2** 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.

4.9.6 Detailed Design of Road and Pavements, Bridges, and Structures

4.9.6.1 General

The Consultants are to carryout detailed designs and prepare detailed drawings including the following:

- (i) Geometric design of highway with appropriate level of service;
- (ii) Design of pavement for the widening and rehabilitation for the existing road, paved shoulders, medians, verge (if applicable)s;
- (iii) Bridges, underpass / overpass / cattle pass /subways and structures including ROB's etc.;
- (iv) At-grade intersections;
- (v) ROB for railway crossings as per the requirement and the standards of the Indian Railways; and,
- (vi) 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/ (provided no land acquisition is involved) tree planting/fencing at locations where necessary / required;
- (ix) Drainage design showing location of turnouts, out falling structures, separate drawings sheet for each 5 km. stretch;
- (x) Rehabilitation and repair plan with for bridges and structures design and drawings;
- (xi) Traffic amenities (Parking Areas, Weighing Station and Rest Areas, Bus lay bay etc.);
- (xii) Other safety features.

4.9.6.1.1 Wherever feasible within the constraints of the available land, symmetrical widening of the existing carriageway shall be avoided and the required widening shall be achieved by widening along one side of the existing road.

4.9.6.2 Design Standards

4.4.9.6.1 The Consultants shall evolve Design Standards and material specifications for the Study primarily based on IRC publications, MORTH Circulars and relevant recommendations of the international standards (American, Australian, British, Canadian, Japanese).

4.4.9.6.2 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

4.9.6.3 Geometric Design

4.9.6.3.1 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 within the right of way.

4.9.6.3.2 The detailed design for geometric elements shall cover, but not be limited to the following major aspects:

- (i) horizontal alignment with curve improvement;
- (ii) longitudinal profile;
- (iii) cross-sectional elements;
- (iv) junctions; and
- (v) service roads.

5 The alignment design shall be verified for available sight distances as per the standard norms. The provision of appropriate markings and signs shall be made wherever the existing site conditions do not permit the adherence to the sight distance requirements as per the standard norms.

- 6 The consultants shall make detailed analysis of traffic flow and level of service for the existing road and workout the traffic flow capacity for the improved project road. The analysis should clearly establish the widening requirements with respect to the different horizon periods taking into account special problems such as road segments with isolated steep gradients.
- 7 In the case of closely spaced cross roads the Consultant shall examine different options to reduce conflicts 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 underpasses / subways for large cross traffic of pedestrians and / or animals.
- 9 The Consultant shall also prepare details for intersections taking into account the site conditions, turning movement characteristics, level of service, overall economy and operational safety.

4.9.6.4 Pavement Design

4.9.6.4.1 The detailed design of pavement shall involve:

- (i) strengthening of existing road pavement and design of the new pavement for the widening / additional lane(s), if the findings of the traffic studies and life-cycle costing analysis confirm the requirement for widening or reconstruction of the road;;
- (ii) design of shoulders

4.9.6.4.2 The design of pavement shall primarily be based on IRC publications. However, the Consultants shall use the recommendations given in widely used international practices including AASHTO, NAASRA, RTAC and TRL wherever.

4.9.6.4.3 The design of pavement shall be rigorous and shall make use of the latest Indian and International practices. The design alternatives and the most appropriate design, option shall be established on life-cycle costing and techno-economic consideration.

4.9.6.4.4 For the design of pavement, each set of design input shall be decided on the basis of rigorous testing and evaluation of its suitability and relevance in respect of in-service performance of the pavement. The design methodology shall accompany the design proposals and shall clearly bring out the basic assumptions, values of the various design inputs, rationale behind the selection of the design inputs and the criteria for checking and control during the implementation of works. In other words, the design of pavement structure should take due account of the type, characteristics of materials used in the respective courses, variability of their properties and also the reliability of traffic predictions. Furthermore, the methodology adopted for the design of pavement shall be complete with flow charts indicating the various steps in the design process, their interaction with one another and the input parameter required at each step.

4.9.6.4.5 For the design of overlays for the existing pavement, the strengthening requirement shall duly take into account the strength of the existing pavement vis-à-vis the remaining life. The overlay thickness requirements shall be worked out for each road segment homogenous with respect to condition, strength and sub-grade characteristics. The rehabilitation provisions should

also include the provision of regulating layer. For existing pavement with acceptable levels of cracking, provision of a crack inhibiting layer should also be include.

- 4.9.6.4.6 Latest techniques of pavement design and rehabilitation like provision of geo-synthetics and cold/hot pavement recycling, use of modified bitumen etc. should be duly considered.
- 4.9.6.4.7 The pavement design task shall also cover working out the maintenance and strengthening requirements and periodicity and timing of such treatments. The maintenance requirements would be identified and evaluated for a period of 6-8 years after rehabilitation, together with the bill of quantities and the cost estimates and incorporated in the bid documents.

4.9.6.5 Design of Embankments

- 4.9.6.5.1 The embankments design should provide for maximum utilization of locally available materials consistent with economy. Use of fly ash wherever available within economical leads and technically feasible must be considered. In accordance with Government guidelines, use of fly ash within 50 kms from Thermal Power Stations is mandatory.
- 4.9.6.5.2 The Consultants shall carry out detailed analysis and design for all embankments of height greater than 6 m based on relevant IRC publications.
- 4.9.6.5.3 The design of embankments should include the requirements for protection works and traffic safety features.
- 4.9.6.5.4 Height of the Embankment shall be adopted as per IRC SP-70

4.9.6.6 Design of Bridges and Structures

- 4.9.6.6.1 The Consultant shall prepare General Arrangement Drawing (GAD) and Alignment Plan showing the salient features of the **new bridges and structures proposed to be constructed** / reconstructed along the road sections covered under the Study. These salient features such as alignment, overall length, span arrangement, cross section, deck level, founding level, type of bridge components (superstructure, substructure, foundations, bearings, expansion joint, 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 BSRDCL, PATNA, BIHAR to approve the best alternative.
- 4.9.6.6.2 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, reconstruction or widening separately to the Client. The Consultant shall assist BSRDCL, PATNA, BIHAR in pursuing the Indian Railways Authorities or/and any statutory authority of State/Central Government for approval of the GAD from concerned Authorities.
- 4.9.6.6.3 Subsequent to the approval of the GAD and Alignment Plan by BSRDCL, PATNA, BIHAR and Railways, the Consultant shall prepare detailed design as per IRC and Railways guidelines and detailed drawings for all components of the bridges and structures. The Consultant shall furnish the design and detailed drawings for suitable protection works and/or river training works wherever required.

- 4.9.6.6.4 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.
- 4.9.6.6.5 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.
- 4.9.6.6.6 Subsequent to the approval of the GAD and the alignment plan by BSRDCL,PATNA,BIHAR, detailed design shall also be carried out for the proposed underpasses, overpasses and subways.
- 4.9.6.6.7 The Consultants shall also carry out the design and make suitable recommendations for protection works for bridges and drainage structures, wherever required./ found inadequate.
- 4.9.6.6.8 In case land available is not adequate for embankment slope, suitable design for RCC retaining wall/ toe wall shall be furnished. However, RE wall may also be considered depending upon techno-economic suitability to be approved by BSRDCL,PATNA,BIHAR.
- 4.9.6.6.9 Balancing culvert/ structure shall be considered while designing the road.

4.9.6.7 Drainage System

- 4.9.6.7.1 The requirement of roadside drainage system and the integration of the same with proposed cross-drainage system shall be worked out for the entire length of the project road section.
- 4.9.6.7.2 In addition to the roadside drainage system, the Consultants shall design the special drainage provisions for sections with super-elevated carriageways, high embankments and for road segments passing through cuts. The drainage provisions shall also be worked out for road segments passing through urban areas.
- 4.9.6.7.3 The designed drainage system should show locations of turnouts/outfall points with details of outfall structures fitting into natural contours. A separate drawing sheet covering every 5 km. stretch of road shall be prepared.

4.9.6.8 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 sign boards, crash barriers, delineators etc. The locations of these features shall be given in the reports and also shown in the drawings.

4.9.6.9 Arboriculture and Landscaping

The Consultants shall work out appropriate plan for planting of trees (specifying type of plantation), horticulture, floriculture on the surplus land of the right-of-way with a view to beautify the highway and making the environment along the highway pleasing. The existing trees / plants shall be retained to the extent possible.

4.9.6.10 Bus Parking, Truck Lay-byes, Weighing Station, Parking Areas and Rest Areas

The consultant shall suggest suitable sites for Bus Parking, Truck Laybys 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.

4.9.6.11 Miscellaneous Works

The Consultants shall prepare detailed plan for the traffic management and safety during the construction period.

4.10 Environment and Social Impact Study

The consultant shall under take the detailed environmental, social and poverty impact studies in accordance with the standard set by the Government of India and EXTERNAL FUNDING AGENCY including Environmental Assessment Guidelines (2003) of including EXTERNAL FUNDING AGENCY, as may be amended from time to time.

4.10.1 Environmental Impact

- 4.10.1.1 The consultant should carry out the preliminary environmental screening to assess the direct and induced impacts due to the project and to classify the project from environmental aspects (The project should be categorized as an A or B project in accordance to the EXTERNAL FUNDING AGENCY's Environmental Assessment Guideline (2003) as well as classification based on the Govt. requirement for environmental assessment study.
- 4.10.1.2 The consultant will carry out environmental assessment study based on the requirement emerged from classifying the project. If it is "B" project, the initial environment examination (IEE) should be carried out in accordance with EXTERNAL FUNDING AGENCY's Environmental Assessment Guidelines (2003) as amended from time to time / Government of India Guidelines, as applicable and if the IEE warrants that EIA need to be prepared., the consultant has to prepare the EIA study. If the project is classified as an "A" project, the EIA will be prepared in accordance with EXTERNAL FUNDING AGENCY's Environmental Assessment Guidelines (2003) as amended from time to time / Government of India Guidelines.
- 4.10.1.3 The consultant shall assess and document baseline conditions relevant to the project with the objective to establish the benchmarks.
- 4.10.1.4 If any project pass through forest land and pass through nearby forest land (less than 1 km), the consultant has to clearly identify the legal status of the forest, whether the forest is part of National parks or Wildlife Sanctuaries or other special status of the forest. If the forest is national Park or Sanctuary, the consultant has to undertake vegetation analysis, and raid wildlife movement study along the roads that pass through/ nearby national parks or sanctuaries.
- 4.10.1.5 The consultant shall assess the potential positive and negative significant impacts due to the project and identify the cost effective mitigative measures to address these impacts adequately in the Environmental Monitoring and Management Plant (EMMP)
- 4.10.1.6 The consultant shall do the analysis of alternatives incorporating environmental concerns and the associated costs in the economic analysis. This should include with and without scenario and modification incorporated in the proposed project due to environment considerations.

- 4.10.1.7 The consultant shall give special attention to the environmental enhancement measures in the project for the following:
- (i) Cultural property enhancement along the highways;
 - (ii) Bus bays and bus shelters including a review of their location;
 - (iii) Highway side landscape and enhancement of the road junctions;
 - (iv) Enhancement of highway side water bodies, and
 - (v) Redevelopment of the borrow areas located on public land.
- 4.10.1.8 The IEE report including an EMMP will be prepared with adequate public consultation and the recommendations arising thereon. If the EIA needs to be prepared, 2 step consultations with affected people needs to be done. First consultation should aims together environmental concerns of the affected people, and second consultation is to share the result of the study especially of EMP to mitigate the environmental impacts..
- 4.10.1.9 All mitigation measures are identified in the IEE and EMMP should be incorporated in the project design so that they are carried out during construction, operation and maintenance in consultation with the stakeholders.
- 4.10.1.10 The consultant shall prepare the bill-of-quantities (BOQ) and technical specifications for all items of work on account of environmental enhancement measures in such a way that these may be readily integrated to the construction contracts.
- 4.10.1.11 The consultant shall establish a suitable monitoring network with regard to air, water and noise pollution & Noise Barriers. 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.
- 4.10.1.12 The consultant shall provide Climate change adaptation and mitigation cost in tabulation sheet and ensure that environmental related staffing, training and institutional requirements are budgeted in project cost.
- 4.10.1.13 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 BSRDCL, PATNA, BIHAR. The consultants will make presentation, if required, in defending the project to the MOEF Infrastructure Committee.
- 4.10.1.14 The consultant shall identify and plan for plantation of the suitable trees along the existing highway in accordance with IRC guidelines.
- 4.10.1.15 The consultant shall assist in providing appropriate input in preparation of relevant environment and social sections.

4.10.2 Social and Poverty Impacts

- 4.10.2.1 The social and poverty analysis impact studies shall be carried out in accordance with Government of India policy and EXTERNAL FUNDING AGENCY Guidelines. The social analysis study will, among other things, provide a socio-economic profile of the project area and address in particular, indigenous people, communicable disease particularly HIV/AIDS, Human trafficking, poverty alleviation, gender, local population, industry, agriculture, levels of poverty and unemployment, health, education, child labour, land acquisition and resettlement.
- (i) The study will include all parameters required to be reviewed and evaluated in accordance with the selection criteria, evaluation and ranking procedures at Supplement I.

- (ii) The consultant will carry out (a) the initial poverty and social assessment; (b) assessment on social issues such as indigenous people; gender; HIV/AIDS; human trafficking; and labours including child labour with respect to the projects in accordance with Handbook on Poverty and Social Analysis. The Consultant shall also provide handout for enhancing the Knowledge about COVID related behavior/norms.
- (iii) The consultant will prepare a report on (a) initial poverty and social assessment; and (b) mitigation plan to address social issues.
- (iv) The consultant will minimize the involuntary resettlement and roads having insignificant resettlement impact (significance categories B & C) or no negative impact will be selected. (Refer To OM/F2 for definition of category B and C)
- (v) The consultant will prepare checklist for (a) involuntary resettlement; (b) indigenous peoples screening and impact categorization for each sub-project.
- (vi) Based on the findings of IR and IP screening and impact categorization; (a) resettlement framework, (b) appropriate resettlement plans for each sub-project, (c) IPDF, (d) indigenous peoples development plan or specific action to address IP issues (to be incorporated in RPs) will be have to be prepared. All these will be prepared. These will be prepared in accordance with EXTERNAL FUNDING AGENCY's Policy on involuntary Resettlement (1995), Handbook on Resettlement – A Guideline to Good Practice, EXTERNAL FUNDING AGENCY's Policy on Indigenous People (1998); India's National Resettlement Policy on Resettlement and Rehabilitation for Project (NPRR 2003); and Land Acquisition Act (1984).
- (vii) In order to prepare the resettlement plan, the consultant would conduct:
 - a) 25% base line socio-economic survey of affected persons and 100% census survey to assess the impacts on the people, properties, common property resources and loss of livelihood. The socio-economic survey will establish the benchmark for monitoring of R&R activities. Consultation with affected persons and other stakeholders to identify mechanisms to improve project designs, minimize resettlement impacts to meet the needs of different stakeholders. A summary of stakeholders discussions, issue raised and how the project design was developed to meet stakeholders needs will be prepared.
 - b) All non-titled occupants should be recorded at the initial stages so that identify cards can be issued to ensure there is no further influx of people into the project area. The recorded date at the initial stage will serve as an eligibility cut-off date for non-titled occupants. All consultations with affected persons (to include list of participants) should be fully documented and records made available to BSRDCL,PATNA, BIHAR.
 - c) Assessment on the impact of the project on the poor and vulnerable groups and indigenous people (if any) along the project road corridor.
 - d) Based o the identified impacts, developing entitlement matrix for the project affected people. Assessment of feasibility and effectiveness of income restoration strategies and suitability and availability of relocation sites.

- e) Assessment on social issues such as indigenous people, gender, HIV/AIDS, labours including child labour.
 - f) Implementation budgets, sources and timing of funding and schedule of tasks.
 - g) Responsibility of tasks, institutional arrangements and personnel for delivering entitlement and plans to build institutional capacity.
 - h) Internal and external Monitoring plans, key monitoring indicators grievance redress mechanism.
 - i) Incorporating any other suggestions of the EXTERNAL FUNDING AGENCY and BSRDCL,PATNA,BIHAR, till the acceptance of the reports by the EXTERNAL FUNDING AGENCY/ BSRDCL, PATNA, BIHAR, as applicable.
- (viii) The report on resettlement impacts would include the following:
- a) Executive Summary
 - b) Description of project
 - c) Objectives of the Project.
 - d) The need for Resettlement in the Project and evaluation of measures to minimize resettlement.
 - e) Description and results of public consultation and plans for continued participation of PAPs.
 - f) Definition of PAPS and the eligibility criteria.
 - g) Socio-economic of PAPs; census and survey results-number affected, how are they affected and what impacts will the experience.
 - h) Legal and entitlement policy framework-support principles for different categories of impact.
 - i) Organizational responsibilities for IR implementation
 - j) Mechanisms for resolving of conflicts and appeals procedures.
 - k) Proposed income restoration program for PAPs
 - l) Arrangements for monitoring and evaluation (internal and external)
 - m) Implementation schedule for resettlement which is linked to the civil works contract.
 - n) A matrix of scheduled activities to indicate clearly what steps and actions will be taken at different stages and the time frame.
 - o) The payment of compensation and resettlement during the acquisition process.
 - p) An itemized budget (replacement value for all assets) and unit costs for different assets.

4.10.2.2 A social assessment would be conducted for the entire project to identify mechanisms to improve project designs to meet the needs of different stakeholders. A summary of stake holders discussions, issue raised and how the project design was developed to meet stakeholders need would be prepared.

4.10.2.3 The Resettlement and Rehabilitation Plan would assess feasibility and effectiveness of income restoration strategies and suitability and

availability to relocation sites. The resettlement plan which accounts for 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 should be recorded at the initial stages so that identify cards can be issued to ensure there is no further influx of people into the project area. All consultants with affected persons (to include list of participants) should be fully documented and records made available to BSRDCL,PATNA,BIHAR.

- (i) Assessment on the impact of the project on the poor and vulnerable groups along the project road corridor.
- (ii) Based on the identified impacts, developing entitlement matrix for the project affected people.
- (iii) Assessment on social issues such as indigenous people, gender, HIV/AIDS, labours including child labour.
- (iv) Implementation budgets, sources and timing of funding and schedule of tasks.
- (v) Responsibility of tasks, institutional arrangements and personnel for delivering entitlement and plans to build institutional capacity.
- (vi) Internal and external Monitoring plans, key monitoring indicators and grievance redress mechanism.
- (vii) Incorporating any other suggestions of the EXTERNAL FUNDING AGENCY and BSRDCL,PATNA,BIHAR, till the acceptance of the reports by the EXTERNAL FUNDING AGENCY/ BSRDCL,PATNA,BIHAR, as applicable.

4.10.2.4 The relevant resettlement plans should be updated and modified to incorporate changes, if any, that may be necessitated by the detailed engineering designs prepared for the Projects in accordance with the requirements specified in Supplement I.

4.10.2.5 The consultant shall incorporate in the bid document the following requirements for compliance during implementation of the project:

- (i) Civil works contractors employed under the Project undertakes appropriate health and safety programs to, amongst others, disseminate information to the construction workers on human immunodeficiency virus/acquired immunodeficiency syndrome and preventive measures;
- (ii) Civil works contractors complies with all applicable labor laws of India and the State Government, and does not employ child labor for construction and maintenance activities;
- (iii) Employment targets, as acceptable, are set for women in road construction activities;
- (iv) Civil works contractors does not differentiate between wages of men and women workers for work of equal value; and
- (v) Appropriate child-care facilities are provided at or around the construction campsites.

4.10.3 Reporting Requirements of Environment Impact

4.10.3.1 The consultant would prepare the stand-alone reports including the IEE and EMMP as per the requirement of the EXTERNAL FUNDING AGENCY/ BSRDCL,PATNA,BIHAR, as applicable, with contents as per the following:

- (i) Executive Summary
- (ii) Description of the Project
- (iii) Environmental setting of the project
- (iv) Identification and categorization of the potential impacts (during pre-construction, construction and operation periods)
- (v) Analysis of alternatives (this would include correlation amongst the finally selected alternative alignment/routing and designs with the avoidance and environmental management solutions)
- (vi) The public consultation process
- (vii) Typical plan or specific designs for all additional environmental items as described in the scope of work
- (viii) Incorporating any other as per the suggestions of the EXTERNAL FUNDING AGENCY/BSRDCL, BIHAR, till the acceptance of the reports by the EXTERNAL FUNDING AGENCY/ BSRDCL, BIHAR, as applicable

4.10.3.2 EMMP (Environment Monitoring and Management Plan) Reports for Each Contract Package based on uniform methodology and processes. The consultant will also ensure that the EMMP has all the elements for it to be a legal document. The EMMP reports would include the following:

- (i) Brief description of the project, purpose of the EMMP, commitments on incorporating environmental considerations in the design, construction and operations phases of the project and institutional arrangements for implementing the EMP.
- (ii) A detailed EMMP for construction and operational phases with recourse to the mitigation measures for all adverse impacts.
- (iii) Detailed plans for highway-side tree plantation (as part of the compensatory afforestation component).
- (iv) Environmental enhancement measures 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.
- (v) Environmental monitoring plans during and after construction including scaling and measurement techniques for the performance indicators selected for monitoring.
- (vi) The EMP should be amendable to be included in the contract documents for the works.
- (vii) Incorporating any other as per the suggestions of the EXTERNAL FUNDING AGENCY and the BSRDCL till the acceptance of the reports by the EXTERNAL FUNDING AGENCY/ BSRDCL, as applicable.

4.10.4 Reporting requirements for social and poverty impacts

The reports to be prepared by the consultant would cover the following:

- (i) Initial Poverty and Social Assessment Report along with mitigation plan for social risks and vulnerabilities especially related to gender, HIV/AIDS transmission and Human trafficking, etc.
- (ii) Checklists for initial poverty and social assessment, involuntary resettlement and indigenous peoples development.
- (iii) Resettlement Framework
- (iv) Resettlement plan/s for each sub-project
- (v) IPDF
- (vi) IPDP(if required)

4.11 Scope of LAP

- i. The consultant needs to collect copies of revenue maps for all villages falling in the proposed alignment from authorized sources (Map Office at Gulzaribagh, Patna)
- ii. All copies of revenue maps must be stamped and signed by authorized Record Officer from the Map Office.
- iii. The consultant needs to ensure that revenue maps are scanned to the actual scale and size to avoid any mismatching of digital maps and plot size.
- iv. The consultant needs to ensure joining of digitized maps by collecting coordinates of available landmarks in the revenue maps.
- v. All revenue maps should be digitized using AutoCAD software with clear numbering of plots in English.
- vi. The consultant would take necessary measures to ensure superimposition of alignment on the digitized maps with proper marking of chainages and village boundaries.
- vii. The consultant must digitize all affected plots including adjoining plots also.
- viii. The LAP should be having clear marking of Existing Center Line (ECL), Proposed Center Line, (PCL), Existing Right of Way (EROW) and Proposed Right of Way (PROW) with specific colors.
- ix. The LAP needs to be leveled along with proper legends and color codes.
- x. The LAP document should be accompanied with complete list of affected plots along with affected area.
- xi. The LAP document must include details of landholders collected from concerned Circle Officer (CO) on attached format (refer **Annexue-1**)
- xii. The consultant needs to submit both soft and hard copies (3 sets) of LAP along with certified copies of revenue maps collected from Revenue Department. The LAP should include digitized land plan for entire length and land acquisition plan for sections requiring land acquisition.

Check list for BSRDC to Review LAP

Parameters	Yes/No/Remarks
The LAP covers 100% length including land plan for no-land acquisition section and land acquisition plan for proposed acquisition sections.	
Certified copies (stamped and signed by authorized record officer) of revenue maps for all villages falling along the alignment is available with LAP	
All revenue maps are scanned with actual size and to the scale	
Digitization of all affected plots with clear numbering are done in the LAP	
Digitization of at least one additional plot (unaffected) after the affected plots is done for using during further process of LRP preparation	
All digitized	
Proper superimposition of alignment plan is made in the LAP	
ECL marked in the LAP	
PCL marked in the LAP	
EROW marked in the LAP	
PROW marked in the LAP List of all affected plots and area are attached	
Details of landholders in prescribed format attached	
LAP is properly labeled with legends	
LAP submitted in both hard and soft copy	

Annexure -1**Ownership Details collection Format**

SL. NO.	NAME OF VILLAGE	THANA NO.	REVENUE THANA	P.S.	ANCHAL	DISTRICT	KHATA NO.	PLOT NO.	TOTAL KHATIYANI AREA	CLASSIFICATION OF LAND	NAME OF KHATIYANI RAIYAT	NAME OF PRESENT RAIYAT WITH FULL ADDRESS	JAMABANDI NO	REMARKS
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

4.12 Estimation of Quantities and Project Costs

- 4.12.1 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 MORTH's Standard Data Book and market rate for the inputs or the local schedule of rates. 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 each civil work Package as defined in this TOR.
- 4.12.2 The Consultants shall make detailed analysis for computing the unit rates for the different items of works. The unit rate analysis shall duly take into account the various inputs and their basic rates, suggested location of plants and respective lead distances for mechanized construction. The unit rate for each item of works shall be worked out in terms of manpower, machinery and materials. Cost estimates include foreign exchange and local components, separately identifying taxes and customs duties.
- 4.12.3 The project cost estimates so prepared are to be checked against rates for similar on-going works in India

4.13 Economic Analysis

- 4.13.1 The road project should be divided into the traffic homogenous links based on the findings of the traffic studies. The homogenous links of the road project should be further subdivided into sections based on physical features of road and pavement, sub-grade and drainage characteristics etc. The economic analysis shall be carried out separately for each traffic homogenous link as well as for the project.
- 4.13.2 The values of input parameters and the rationale for their selection for the economic analyses shall be clearly brought out.
- 4.13.3 For models to be used for the economic analyses, the calibration methodology and the basic parameters adapted to the local conditions shall be clearly brought out.
- 4.13.4 The economic should bring out the priority of the different homogenous links in terms of project implementation.
- 4.13.5 The Consultants shall carry out economic analysis for the road project in accordance with the EXTERNAL FUNDING AGENCY guidelines for Economic Analysis of Projects. 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.
- 4.13.6 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 200-year period after construction/rehabilitation. 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.
 - (vi) Define maintenance schedule of routine and periodic maintenance, including unit costs. The periodic maintenance will be set in such a way as either responsive to road and/or traffic conditions or scheduled every certain year, taking into account the realistic budgeting.
- 4.13.7 Economic Internal Rate of Return (EIRR) and Net Present Value (NPV) should be worked out based on these cost-benefit streams. Furthermore, sensitivity of EIRR and NPV worked out for the different scenarios as given under:

Scenario - I	Base Costs and Base Benefits
Scenario - II	Base Costs plus 20% and Base Benefits
Scenario - III	Base Costs and Base Benefits minus 20%
Scenario - IV	Drop in traffic growth rates by 50%
Scenario - V	No generated traffic benefits
Scenario - VI	Two-year project implementation delay
Scenario - VII	Less than optimal road maintenance such as delay or omission of periodic maintenance
Scenario - VIII	Base Costs plus 20% and Base Benefits minus 20%

- 4.13.8 The sensitivity scenarios given above are only indicative. The Consultants shall select the sensitivity scenarios taking into account possible construction delays, construction costs overrun, traffic volume, revenue shortfalls, operating costs, exchange rate variations,

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convertibility of foreign exchange, interest rate volatility, non-compliance or default by contractors, political risks and force majeure.

4.13.9 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.

4.13.10 The consultant shall suggest ways of enhancing/making the projects in terms of project economics attractive.

5. Selection and Prioritization of projects

For the purpose of selection as project for EXTERNAL FUNDING AGENCY financing, a road project must meet the selection criteria and evaluation requirements including attaining a minimum 12% estimated economic internal rate of return. The sub-projects shall further be prioritized using the ranking criteria. The project selection criteria including evaluation and ranking criteria are at Supplement I. The consultant shall prepare and submit a report on Selection and Prioritization of projects as early as possible, e.g. preliminary list at STAGE 2 – Interim Report for Govt. of Bihar and EXTERNAL FUNDING AGENCY's consideration. The preparation of bid documents and final detailed design report should be carried out only after the respective projects are determined for possible EXTERNAL FUNDING AGENCY financing.

6. Time period for the service

6.1 Time period envisaged for the study of each of the projects is Four months. The final reports, drawings and documentation shall be completed within this time schedule.

6.2 BSRDCL, PATNA, BIHAR shall arrange to give observations and comments on all sketches, drawings, reports and recommendations and other matters and proposals submitted for decision by the Consultant in such reasonable time so as not to delay or disrupt the performance of the Consultant's services.

7. Project Team and Project Office of the Consultant

7.1 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.

7.2 Key personnel shall be as per TOR The key personnel fielded by the consultant shall not be shifted during the entire period of the services

7.3 The Consultants shall establish an office at the project site manned by senior personnel during the course of the surveys and investigations. All the project related office work shall be carried out by the consultant in their site office unless there are special reasons for carrying out part of the office work elsewhere for which prior approval of BSRDCL, PATNA, 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 BSRDCL, PATNA, BIHAR before commencement of the services.

7.4 All necessary technical support staff and office support staff shall be provided by the consultant. They should however bring out the details of these personnel and their duration of deployment in the technical proposal.

7.5 The consultant shall mobilize all necessary survey equipment, computers, software, other equipment and all other equipment required to fulfill the job

7.6 The consultant shall include all necessary vehicles motorcycles etc in his proposal which may be required to carry out the job.

7.7 The rates to be quoted shall be on per kilometer basis for Highway Project and Lump-sum basis for Bridges it shall include all costs / expenses, taxes, duties, service tax, cess etc as applicable.

8. Reports to be submitted by the Consultant to BSRDCL,PATNA,BIHAR

- 8.1 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.
- 8.2 Project preparation activities will be split into four stages as brought out below.
- Stage 1:** Quality Assurance Plan; Inception Report
Stage 2: Feasibility study and Project Selection and Prioritization Report (PSPR)
Stage 3: Draft Detailed Project Report .
Stage4: Detailed Project Report (Part II)
- 8.3 Time schedule in respect of all such stages has been indicated in the next para. 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.
- 8.4 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 II. Further, the reports shall also be submitted in Pen drive / CD's in addition to the hard copies as mentioned in Enclosure-II. Consultant shall submit all other reports mentioned specifically in the preceding paras of the TOR.
- 8.5 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 each construction package (Section) simultaneously. As far as possible, the proposal should include complete information such as number of such persons, name, position, period of engagement, remuneration rate etc. The Consultant is also advised to start necessary survey works from the beginning so as to gain time in respect of various other activities in that stage

STAGE -1

8.2.1 Quality Assurance Plan (QAP) Document

Immediately upon the award, the Consultants shall submit four copies of the QAP document covering all aspects of field studies, investigations design and economic 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 project preparation, since inception to the completion of work.

8.2.2 Inception Report (IR)

The report shall cover the following major aspects:

- (i) Project appreciation;
- (ii) Detailed methodology to meet the requirements of the TOR finalised in consultation with the BSRDCL, PATNA, 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) Key plan and Linear Plan;
- (vii) 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;
- (viii) Draft design standards; and

STAGE -2

8.2.3 Feasibility study

8.2.3.1 The Consultant shall commence the project preparation for the road projects in accordance with the accepted IR and the report shall contain the following:

- i. Executive summary
- ii. Project description including possible alternative alignments/bypasses and technical/engineering alternatives
- iii. Methodology adopted for the study
- iv. Socioeconomic profile of the project areas
- v. Road safety audit including black spot identification and analysis
- vi. Indicative design standards, methodologies and specifications
- vii. Traffic surveys and analysis
- viii. Outline proposals for rehabilitation / widening of existing roads including shoulder composition and cross sections; rehabilitation / widening of existing structures; new bridges, cross structures, underpasses/overpasses, subways; reconstruction of existing structures; service roads, truck lay byes, bus stops, etc in order to finalize those before taking up the detailed design
- ix. Environmental screening and initial environmental examination
- x. Checklists for involuntary resettlement, indigenous people's development, and initial poverty and social assessments; Initial social impacts including impacts on poverty and on indigenous people
- xi. Preliminary land acquisition/resettlement impact, and resettlement requirements
- xii. Preliminary Cost estimates
- xiii. Economic analysis

8.2.3.2 The basic data obtained from the field studies and investigations shall be submitted in a separate volume as an Appendix to the Report.

8.2.3.3 Any comments, revisions and modifications in the Report suggested by BSRDCL, PATNA, BIHAR shall be incorporated and submitted within 15 days of receipt of comments from BSRDCL.

8.2.3.4 Project Selection and Prioritization Report (PSPR)

The report on Project Selection and Prioritization shall be prepared to present the details of qualification or otherwise of road project through the selection criteria and evaluation requirements (Supplement I) including attainment of a minimum 12% estimated economic internal rate of return. The sub-projects shall further be prioritized using the ranking criteria (Supplement I). The report shall include recommendations/ proposals for contract packages for procurement of civil works and proposed implementation schedule.

STAGE: 3

8.2.4 Draft Detailed Project Report (DDPR)

8.2.4.1 The DDPR 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.

8.2.4.2 The Report volumes shall be submitted as tabulated in para 10 above.

8.2.4.3 The Documents and Drawings shall be submitted for each section (Package) and shall be in the following format:

Volume-I, Main Report

8.2.4.4 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.

8.2.4.5 The Report shall also include maps, charts and diagrams showing locations and details of existing features and the essential features of improvement and upgrading.

8.2.4.6 The Environmental Impact study report including Initial Environmental Examination (IEE) and EMMP (Environmental Monitoring And Management Plan) for each project shall be submitted separately as a part of the main report.

8.2.4.7 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.

Volume - II, Design Report

8.2.4.8 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 and cross-drainage structures. The design report shall include detailed analysis for recommendations with regard to the proposals for rehabilitation, widening including shoulder composition and cross-sections, new bridges, cross drainage structures, underpasses, overpasses, subways, reconstruction of existing bridges, service roads, road amenities in line with the description given above. The sub-soil exploration report including the complete details of boring done, analyses and interpretation of data and the selection of design parameters shall be included as an Appendix to the Design Report.

8.2.4.9 The detailed design for all features should be carried out as per the requirements of the Design Standards for the project. However, there may be situations wherein it has not been possible to strictly adhere to the design standards due to the existing site

conditions, restrictions and other considerations. The report should clearly bring out the details of these aspect and the standards adopted.

Volume - III, Materials Report

- 8.2.4.10 The Materials Report shall contain details concerning the proposed borrow areas and quarries for construction materials and possible sources of water for construction purposes. The report shall include details on locations of borrow areas and quarries shown on maps and charts and also the estimated quantities with mass haul diagram including possible end use with leads involved, the details of sampling and testing carried out and results in the form of important index values with possible end use thereof.
- 8.2.4.11 The materials Report shall also include details of sampling, testing and test results obtained in respect physical properties of subgrade soils. The information shall be presented in tabular as well as in graphical representations and schematic diagrams. The Report shall present soil profiles along the alignment.
- 8.2.4.12 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 stabilisation (cement, lime, mechancial) should be included in the Report.

Volume - IV, Cost Estimates

- 8.2.4.13 This volume will present the contract package wise cost of each item of work as well as a summary of total cost.

Volume - V, Rate Analysis

- 8.2.4.14 This volume will present the analysis of rates as per present SOR 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.

Volume - VI, Drawing

- 8.2.4.15 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:
- (i) Horizontal Alignment and Longitudinal Profile.
 - (ii) Cross-section @ 50m interval along the alignment within ROW
 - (iii) Typical Cross-Sections with details of pavement structure.
 - (iv) Detailed Drawings for individual Culverts and Cross-Drainage Structures.
 - (v) Detailed Drawings for individual Bridges, tunnels and Structures.
 - (vi) Detailed Drawings for Improvement of At-Grade and Grade-Separated Intersections and Interchanges.
- 8.2.4.16 Drawings for Road Sign, Markings, Toll Plazas, office-cum-residential complex for PIU, and other Facilities.
- 8.2.4.17 Schematic Diagrams (linear chart) indicating but be not limited to be following:
- (i) Widening scheme;
 - (ii) Locations of median openings, intersections, interchanges, underpasses, overpasses, bypasses;
 - (iii) Locations of service roads;
 - (iv) location of traffic signals, traffic signs, road markings, safety features; and,
 - (v) locations of parking. areas, weighing stations, bus bays, rest areas, if any.

8.2.4.18 Requirement of Drawing in DPR (Drawing with List)

- (i) Contents – Index – Location Map.
- (ii) Details of GPS Pillar, Bench Mark, and Reference Pillar & Centre line Co- ordinates.
- (iii) Horizontal & Vertical Curve Details.
- (iv) Typical Cross Section
- (v) Plan & Profile- Plan & Profile of all Km
- (vi) Slip road Plan & Profile- Slip road if any ROB, VUP
- (vii) Major/Minor Junction Improvement – In Details with list.
- (viii) Schematic Diagrams (Optional)- linear chart.
- (ix) Road Sign & Road marking Plan- Road Marking.
- (x) Drainage Plan and Longitudinal Profile – Road Drain arrangement to discharge the rain water to nearest Structure.
- (xi) List of Structure.
- (xii) Major Bridge – Drawing & Details.
- (xiii) Minor Bridge- Drawing & Details.
- (xiv) Box Culvert- - Drawing & Details.
- (xv) Pipe Culvert — Drawing & Details.
- (xvi) ROB/VUP if applicable.
- (xvii) Structure for widening- if applicable.
- (xviii) Structure Reinforcement or BBS Details.
- (xix) Details of Expansion Joint.
- (xx) Details of Bearing/Bearing pedestal.
- (xxi) Details of Drainage spout.
- (xxii) Details of RCC Crash Barrier.
- (xxiii) Standard Drawing-
 - (a) Details of attainment of super elevation.
 - (b) Curve improvement Widening detail if any.
 - (c) Bus lay Bay.
 - (d) Bus shelter Details
 - (e) Truck lay Bay if any.
 - (f) Metal Beam Crash Barrier.
 - (g) Typical details/Drawing of Boundary Pillar.
 - (h) 5th Km, Km, 200 mtr stone details/Drawing.
 - (i) Road Signage details with locations.
 - (j) Over head Sign, Gantry Detail.
 - (k) Details of guard post & Delineators.
 - (l) Pavement marking details.
 - (m) Detail arrangement of rigid Pavement – Dowel/Tie.
 - (n) Details of chute drain/Energy Dissipation/Toe wall/kerb.
 - (o) Details of lined/earthen drain.
 - (p) Detail of utility duct.
 - (q) RCC/PCC Toe wall and stone Pitching at embankment
 - (r) Typical Cross section with FLY ASH Embankment filling (If applicable).
 - (s) Median Drain in four lane (If applicable).
 - (t) List of structure.
- (xxiv) Any Other Drawing and Details If applicable in the Project.

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- 8.2.4.19 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 BSRDCL PATNA. 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.
- 8.2.4.20 The typical cross-section drawings should indicate the scheme for future widening of the carriageway. The proposed cross-sections of road segment passing through urban areas should indicate the provisions for pedestrian movements and suitable measures for surface and sub-surface drainage and lighting, as required.

Volume - VII, Poverty and Social Assessment Report including Resettlement Plan

- 8.2.4.21 The Report shall be prepared conforming to the Guidelines of the Government of India, State Government and EXTERNAL FUNDING AGENCY as appropriate for each project.

STAGE: 4

8.2.5 Detailed Project Report (DPR) – Part-II

The comments of the BSRDCL,PATNA,BIHAR if any, on the reports submitted at Stage-3 shall be incorporated and such volumes shall be resubmitted along with the following:

- (i) Bid documents for the projects in four volumes,
- (ii) Volume-I shall contain Instructions to Applicants, Appendix to Bid, General and Particular Conditions of Contract based on FIDIC, various Forms etc.
- (iii) Volume-II shall contain Technical Specifications based on MORT&H's Technical Specifications for Road and Bridge works;
- (iv) Volume-III shall contain Bill of Quantities
- (v) Volume-IV shall contain drawings
- (vi) Volume - X : Strip Plan and Clearances
 - Details of the centre line of the proposed widened SH / MDR along with the existing and proposed right-of-way limits to appreciate the requirements of land acquisition;
 - 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;
 - Strip plans showing the position of existing utilities and services indicating clearly the position of their relocation;
 - Details for various clearances such as environment and forest clearances;
 - Separate strip plan showing shifting / relocation of each utility services in consultation with the concerned local authorities;
 - 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;

- The strip plans shall be prepared on the basis of data from reconnaissance and detailed topographic surveys.
- The strip plans shall clearly indicate the scheme for widening. The views and suggestions of the BSRDCL, PATNA, BIHAR should be duly taken into account while working out the widening scheme (left, right or symmetrical). The widening scheme shall be finalised in consultation with BSRDCL

8.2.6 Detailed Project Reports, Documents and Drawings (6 Sets)

The Detailed Project Reports, Documents and Drawings, incorporating all revisions deemed relevant following receipt of the comments from BSRDCL, PATNA, BIHAR shall be submitted as per the schedule given in Enclosure II.

9. Interaction with RCD BIHAR

- 9.1 During entire period of services, the Consultant shall interact continuously with BSRDCL, PATNA, BIHAR and provide any clarification as regards methods being followed and carry out modification as suggested by BSRDCL, PATNA, BIHAR. A programme of various activities shall be provided to BSRDCL, PATNA, BIHAR and prior intimation shall be given to BSRDCL, PATNA, BIHAR regarding start of key activities such as boring, survey etc. so that inspections of BSRDCL, PATNA, BIHAR officials could be arranged in time.
- 9.2 The BSRDCL, PATNA, BIHAR officers and other Government officers may visit the site at any time, individually or collectively to acquaint themselves with the field investigation and survey works.
- 9.3 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 BSRDCL, PATNA, 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 at Patna are foreseen during the currency of project preparation.
- 9.4 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.

10. Payment Schedule

- 10.1 The Consultant will be paid consultancy fee as a percentage of the contract value as per the schedule given below:

S.No.	Description	Payment
1	On submission and approval of Stage-I Report	10%
2	On Submission and approval of Stage-2 reports	20%
3	On Submission and approval of Stage-3 report	30%
4	On finalization of Stage-3 reports based on comments of the Employer, and submission of Stage-4 Report and other documents	30%
5	On acceptance of Stage-4 documents, finalization of Addenda for the bidders and fulfillment of other scope of work under TOR	10%
	Total	100%

11. Data and Software

- 10.1 The Hard disc 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 BSRDCL, PATNA, BIHAR at the time of the submission of the Final Report. The data can be classified as follows:
- (i) **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), axle load surveys, Sub-soil Exploration, Drainage Inventory, Inventory data for bridge and culverts indicating rehabilitation, new construction requirement etc. in MS EXCEL or any other format which could be imported to widely used utility packages.
 - (ii) **Topographic Surveys and Drawings:** All topographic data would be supplied in (x, y, z) format along with complete reference so that the data could be imported into any standard highway design software. The drawing files would be submitted in dxf or dwg format.
 - (iii) **Rate Analysis:** The Consultant shall submit the rate analysis for various works items including the data developed on computer in this relation so that it could be used by the Authority later for the purpose of updating the cost of the project.
 - (iv) **Economic and Financial Analysis.**
 - (v) Land Acquisition Plan (LAP) and Land Requisition Plan (LRP)

11.2 Software & Training

- 10.2.1 The Consultant shall also hand-over to BSRDCL, PATNA, BIHAR the hard discs containing any general software including the models which may have been specifically developed for the project.
- 10.2.2 The hard discs should be properly indexed and a catalogue giving contents of all hard discs and print-outs of the contents (data from field studies topographic data and drawings) should be handed over to BSRDCL, PATNA, BIHAR at the time of submission of the Final Report.
- 10.2.3 The Consultant shall also provide at least Three (03) days training/to run AUTOCAD Software to 2 (Two) DGM (Tech.)/Manager (Tech.) of BSRDCL.

SUPPLEMENT - I SELECTION AND EVALUATION OF PROJECTS

A. Selection Criteria for Projects

1. The Projects shall be meet the criteria set forth hereinafter.
 - (a) The Projects shall comprise road sections that comply with any of the following:
 - (i) The selected priority road sections to be upgraded and expanded shall be linked to the State highway network or important industrial / tourism centers;
 - (ii) The selected state road sections to be improved shall have higher traffic volume than 500 vehicles a day and more dynamic economic and commercial activities;
 - (iii) The selected state road sections to be rehabilitated shall be located in such districts in which economic performance may potentially be enhanced with improved road infrastructure and conditions; and
 - (iv) The selected state road sections shall improve connectivity with the rural roads included under the PMGSY and the Rural Roads Project, linking major populous settlements to main and secondary

road networks that will facilitate access of the rural poor to better economic opportunities and social services:

- (b) The economic analysis for each Project shall have been prepared in accordance with the EXTERNAL FUNDING AGENCY's Guidelines for the Economic Analysis of Projects and the estimated economic internal rate of return of each Project shall be equal to or greater than twelve percent (12%).
- (c) The Projects shall have met the- technical specifications and design criteria, including the design codes, set by the Indian Roads Congress' standard publication for state highways and major district roads.
- (d) The Projects shall have undertaken road safety audits to identify areas of major concern, including black spots, and measures to be taken to improve detailed engineering designs with respect to road safety.

B. Evaluation and Ranking of Projects

- 2. Prior to submission for BSRDCL,PATNA,BIHAR approval, each Project shall have been evaluated and ranked in accordance with a scoring system (project ranking criteria), which takes into account the following concerns:
 - (i) traffic level and composition, and connectivity with major arterial and trunk routes;
 - (ii) riding quality of the road segment, flood proneness, presence of expansive soils in the foundation and weak structures;
 - (iii) environmental sensitivity;
 - (iv) social and economic considerations, such as predominant land use pattern and illiteracy levels along the road corridor, proximity to primary health centers and educational institutions, social category of the population along the segment;
 - (v) levels of poverty and unemployment;
 - (vi) involuntary resettlement impacts; and
 - (vii) any other concerns that may arise from the findings and recommendations of the initial poverty and social assessments, resettlement plans and indigenous peoples development plans to be prepared for the Projects.

C. Approval of Projects

- 3 (a) The consultant shall review, evaluate and rank the projects in accordance with the requirements of paragraph 2 here above, and verify the information provided with respect to the Projects and compliance with the selection criteria.
- (b) The following documentation and information, prepared in accordance with sound financial, engineering, and environmental and road maintenance practices shall be furnished for BSRDCL,PATNA, BIHAR's approval:
 - (i) scope of the Project indicating the road link or location, length, present condition and improvements proposed;
 - (ii) feasibility studies including IEEs and EMMPs which shall have been prepared with adequate public consultation, and the recommendations arising there from;
 - (iii) checklists for initial poverty and social assessment, involuntary resettlement and indigenous peoples development;
 - (iv) details of compliance of the Project with the selection criteria described in paragraph 1 above;
 - (v) cost estimates;

- (vi) details of proposed contract packages for procurement of civil works; and
 - (vii) proposed implementation schedule.
- (c) The initial poverty and social assessments with respect to the projects should be prepared and carried out in accordance with the EXTERNAL FUNDING AGENCY Handbook on Incorporating Social Dimensions and Handbook on Poverty and Social Analysis. If required, the resettlement plans, indigenous peoples development plans with respect to the projects shall be prepared and carried out in accordance with the Resettlement Framework And Indigenous Peoples Development Framework prepared for this Project and agreed between the State and EXTERNAL FUNDING AGENCY, the relevant policies and guidelines of EXTERNAL FUNDING AGENCY, in particular, Handbook on Resettlement -A Guide to Good Practice, Handbook on Incorporating Social Dimensions and Handbook on Poverty and Social Analysis.

D. Land Acquisition and Involuntary Resettlement

4. It shall be ensured that:
- (i) technical design for the road rehabilitation works under the Project, does not require widening of the existing rights of way and each civil works contract package is closely screened to exclude those road segments which may require widening of the existing right of way.
 - (ii) involuntary resettlement is minimized and only those road segments with insignificant resettlement impact or no negative impact are selected;
 - (iii) the relevant resettlement plans are updated and modified to incorporate changes, if any, that may be necessitated by the detailed engineering designs prepared for the Projects in accordance with the requirements specified in paragraph 3 here above.

E. Environmental Concerns

5. It shall be ensured that:
- (i) The Project is carried out, and all Project facilities are designed and monitored in compliance with the existing environmental laws and regulations of India and the State Government, and the Environmental Assessment Guidelines (2003) of EXTERNAL FUNDING AGENCY, as may be amended from time to time;
 - (ii) All environmental mitigation measures identified in the IEEs and the EMMPs prepared for the Projects are incorporated in such Projects' design for carrying out during construction, operation and maintenance of the Projects;
 - (iii) Local communities and other stakeholders are duly consulted during the implementation of the Projects on such mitigation measures;
 - (iv) The Projects do not include road segments passing through national parks or sanctuaries, and the clearances required by the Forest Act (1991) and Environment Protection Act (1986) with respect to segments passing through reserve forests are obtained in a timely manner prior to commencement of construction at such segment.

PROJECT RANKING CRITERIA

Traffic

1. The project will be ranked based on composition of traffic, connectivity with major arterial and trunk routes, and traffic levels (existing traffic volume and projected traffic volume).

Environment and Engineering

2. The projects will be ranked based on riding quality, presence of expansive soils in the foundation, weak structures, and the percentage of sections overtopped due to flooding. Environmental sensitivity of the projects will be a primary factor to determine the selection, if any major impact has been identified.

Social and Economic Requirements

3. The projects will be ranked based on predominant land use pattern, proximity to the basic amenities such as primary health centers and educational institutions, and distribution of population in terms of social category. Each project will be screened to minimize involuntary resettlement effects and ensure that resettlement plan and resettlement framework approved by the Government of Bihar and accepted by EXTERNAL FUNDING AGENCY will be strictly implemented and meet the requirements of the EXTERNAL FUNDING AGENCY's safeguard policy for involuntary resettlement. Prior review and approval is required for awards of civil works contracts for such projects.

Poverty, Indigenous Peoples and Resettlement

4. The projects will be ranked on the basis of level of poverty, population served, percentage of unemployment, and recommendations of the poverty impact assessment and the benefit distribution analysis completed by the Asian Development Bank for the Project. Also, projects will be selected in accordance with the findings and recommendations from the IPSA, the initial poverty and social assessments and indigenous people plans and resettlement plans prepared by the Consultant and approved by BSRDCL, PATNA, BIHAR to ensure that all adverse social impacts are mitigated. To minimize unnecessary resettlement impacts, only those projects with significance category B or C will be selected. All projects evaluation reports should be submitted to the BSRDCL, PATNA, BIHAR for review and approval prior to finalization of selection process.

Table SAF.1 shows the criteria and their weights.

TABLE SAF1: PROJECT RANKING CRITERIA

Criterion / Consideration	Priority Score	Indicators of Significance
A. Traffic Consideration		
1. Traffic Composition (50%)		Economic
• Agricultural	3	
• Commercial	2	
• Non Motorized	1	
2. Traffic level		Engineering & Economics
• >1500 vpd	5	
• 1000-1500 vpd	4	

Criterion / Consideration	Priority Score	Indicators of Significance
<ul style="list-style-type: none"> • 500-1000 vpd • 500 -250 vpd • <250 vpd 	3 2 1	
3. Connectivity with Major Road Network		Strategic
<ul style="list-style-type: none"> • NH • SH under Bond Roads • Bond Roads • BOT Roads • None 	5 4 3 2 1	
B. Engineering Consideration – Road Condition		
1. Roughness levels (IRI)		Engineering & Economics
<ul style="list-style-type: none"> • > 10 to15 • 8-10 • 4-8 • <4 	4 3 2 1	
2. Flood prone Sections (% Length)		Engineering & Economics
<ul style="list-style-type: none"> • <5 • 5-10 • 10-15 • >15 	4 3 2 1	
3. No of Weak Structures on the project road		Engineering & Economics
<ul style="list-style-type: none"> • <10 • 10-25 • 25-50 • 50-25 • >50 	5 4 3 2 1	
4. Expansive Soils along the corridor (length)		Engineering & Economics
<ul style="list-style-type: none"> • <10 • 10-25 • 25-50 • 50 	4 3 2 1	
C. Socio economic Consideration		
1. Predominant Land use along the Project Road		Economics
<ul style="list-style-type: none"> • Agricultural • Industrial • Commercial • Barren 	4 3 2 1	
2. Percent (%) literacy level along the Project Corridor		Social & Economics
<ul style="list-style-type: none"> • >50 • 25-50 • 10-25 • <10 	4 3 2 1	
3. Proximity to the Primary health center & Educational institutions		Social & Economics
<ul style="list-style-type: none"> • more than 50 km 	4	

Criterion / Consideration	Priority Score	Indicators of Significance
<ul style="list-style-type: none"> • 25 - 50 km • 10-25 km • <10km 	3 2 1	Social & Poverty
4. Social Category of the population along the road	5	
<ul style="list-style-type: none"> • Indigenous people • Scheduled Tribe • Schedule Caste • Backward Class • Others 	4 3 2 1	
	1	
D. Poverty		
1. Level of poverty in terms of % Population		Poverty
<ul style="list-style-type: none"> • >50 • 25-50 • 10-25 • <10 • 	4 3 2 1	
2. Level of unemployment % Population		Poverty
<ul style="list-style-type: none"> • >75 • 50-75 • 25-50 • 25 	4 3 2 1	
E. Environmental Sensitivity	Projects will not include any road sections going through a national park or sanctuary. Projects will not involve any expansion of ROWs.	
F. Involuntary Resettlement	Sections with involuntary resettlement will be subject to strict implementation of the RPs approved by Govt. of Bihar and acceptable to EXTERNAL FUNDING AGENCY. Prior review and approval of EXTERNAL FUNDING AGENCY is required before awards of civil works contracts for such Project roads.	

SUPPLEMENT-II
SAMPLE CHECKLISTS FOR SAFETY AUDIT

Checklists

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 1-During Feasibility Study

1. The audit team should review the proposed 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> <p>E. Safety implications of the scheme beyond its physical limits i.e. how the scheme fits into its environs and road hierarchy</p>
A1 : 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
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 2 – Completion of Preliminary Design

1. The audit team should review the proposed design from a road safety perspective and check the following aspects	
CONTENTS	ITEMS
Aspects to be checked	A. Safety and operational implications of proposed alignment and junction strategy with particular references to expected road users and vehicle types likely to use the road. B. Width options considered for various sections. C. Departures from standards and action taken. D. Provision of pedestrians, cyclists and intermediate transport E. Safety implications of the scheme beyond its physical limits i.e. how the scheme fits into its environs and road hierarchy
B1 : General	<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 3 – Completion of Detailed Design

1. The audit team should satisfy itself that all issues raised at Stage 1 have been resolved. Items may require further consideration where significant design changes have occurred.	
2. If a scheme has not been subject to a stage 1 audit, the items listed in Checklists B1 to B6 should be considered together with the items listed below.	
CONTENTS	ITEMS
Aspects to be checked	A. Any design changes since Stage 1. B. The detailed design from a road safety viewpoint, including the road safety implications of future maintenance (speed limits; road signs and markings; visibility; maintenance of street lighting and central reserves).
C1 : General	<ul style="list-style-type: none"> ➤ Departures from standards ➤ Drainage ➤ Climatic conditions

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	<ul style="list-style-type: none"> ➤ 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 Markings ➤ T,X,Y-junctions ➤ All roundabouts ➤ Traffic signals
C4 : Non-Motorised road users Provision	<ul style="list-style-type: none"> ➤ Adjacent land ➤ Pedestrians ➤ Cyclists ➤ 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 -1

LIST OF KEY PERSONAL TO BE FIELED FOR PREPAATION OF DETALED PROJECT REPORT

S. N	Name of the position	Number of persons	Period in Month
1	Sr. Highway Engineer-cum-Team Leader	1	4
2	Highway Engineer	1	2
3	Pavement Specialist	1	2
4	Bridge Engineer	1	3
5	Traffic Engineer	1	2
6	Material-cum-Geo-technical Engineer.	1	2
7	Senior Survey Engineer.	1	2
8	Environmental Specialist.	1	2
9	Resettlement & Rehabilitation Specialist.	1	2
10	Quantity Surveyor/ Documentation Expert.	1	2

Note: - All necessary inputs of manpower such as field technical staff, office staff other than the above as deemed necessary shall be provided by consultants within the quoted price to ensure that the entire work is completed in accordance with the TOR within stipulated time frame.

Enclosure -2

Schedule for Submission of Reports and Documents

Submission Time w.e.f Date of Commencement of Consultancy Services (in months)			
Stage No.	Activity	No. of copies	Time Period for assignment
			4 Months
1	Monthly Reports / Quality Assurance Plan	3	Every month
2	Inception Report (i) Inception Report	4	21 days
3	F.S. REPORT & PSPR i) Draft Feasibility Report + Presentation before BSRDCL	4	2 Months
	ii) Final Feasibility Report+ Presentation before BSRDCL (within 15 days of receiving comments of BSRDCL, PATNA, BIHAR on draft feasibility report)	6	2 Months
	iii) Strip Plan with L. A. Reports & Plans	6	2 Months
	iv) PSPR	6	2 Months
4	Draft Detailed Project Report(DDPR). i) Final DDPR including details and drawings for repair/rehabilitation of existing bridges (Final DDPR within 15 days of receiving comments of RCD BIHAR)	6	3 Months
5	Detailed Project Report (DPR) i) Final DPR (including drawings and draft bidding (ICB) documents)	6	4 Months
6	Project clearances /NOC from concerned State agencies like Forest, Irrigation etc. (Original letters from the concerned agencies and 5 photocopies of each.)		4 Months
7	Project Clearances/NOC extra time for Central Govt. Deptt. Like MOEF		Another 2 months

Note :

- In addition to Hard Copy, all Stage Report including Final DPR Reports and related documents have to be submitted in 250 GB or more external along with required Nos. of hard copies mentioned above.
- With reference to stage 7 mentioned above it is clarified that the Period of 2 months shall be given extra for clearance from Central Govt. and it will not be reckoned for the purpose of arriving at completion date of services.

Qualification and Experience Requirement of Key Personnel

1. Senior Highway Engineer-Cum-Team Leader (For Pkg- 09 & 13)

i)	Educational Qualification	
		Graduate in Civil Engineering
ii)	Essential Experience	
	Total Professional Experience	Min. 20 years
	Experience in Highway Projects	Min. 15 years in Planning, project Preparation and design of Highway projects and minimum of 5 years as a Team Leader.
	Experience in similar Capacity	Two laning of Highway projects (NH/SH/Expressways)/ externally aided projects such as WB/ADB/USAID etc. of aggregate length minimum 40% of the DPR package length.
iii)	Max. Age Limit	65 years on the date of submission of proposal

1. Senior Bridge Engineer-Cum-Team Leader (For Pkg- 12)

i)	Educational Qualification	
		Graduate in Civil Engineering
ii)	Essential Experience	
	Total Professional Experience	Min. 20 years
	Experience in Highway / Bridge Projects	Min. 15 years in Planning, project Preparation and design of Bridge projects and minimum of 5 years as a Team Leader.
	Experience in similar Capacity	Two laning of Bridge projects (NH/SH/Expressways)/ externally aided projects such as WB/ADB/USAID etc. Bridge design consultancy projects involving design of minimum three major Bridges/Flyover/ ROB/ Elevated Road (length more than 500 m) in last 5 years.
iii)	Max. Age Limit	65 years on the date of submission of proposal.

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2. Highway Engineer

i)	Educational Qualification	
	Minimum	Graduate in Civil Engineering
ii)	Essential Experience	
	Total Professional Experience	Min. 15 years
	Experience in Highway Projects	Min. 12 years in Planning, project Preparation and design of Highway projects.
	Experience in similar Capacity	Two laning of major Highway projects (NH/SH/Expressways)/ externally aided projects such as WB/ADB/USAID etc. of aggregate length minimum 40% of the respective DPR package length.
iii)	Max. Age Limit	65 years on the date of submission of proposal

3. Pavement Specialist

i)	Educational Qualification	
	Minimum	Graduate in Civil Engineering
ii)	Experience	
	Total Professional Experience	Min. 15 years
	Experience in Highway Projects	Min. 12 years in experience in design and maintenance.
	Experience in similar Capacity	Pavement design for Highway projects (NH/SH/Expressways)/ externally aided projects such as WB/ADB/USAID etc. of aggregate length minimum 40% of the respective DPR package length.
iii)	Max. Age Limit	65 years on the date of submission of proposal

4. Bridge Engineer

i)	Educational Qualification	
	Minimum	Graduate in Civil Engineering
ii)	Experience Experience	
	a) Total Professional Experience	Min. 15 years
	Experience in Highway/Bridge Projects	Min. 10 years in Project preparation and design of bridge projects.
	Experience in similar Capacity	Bridge Engineer in Highway design consultancy projects (NH/SH/Expressways)/ externally aided projects such as WB/ADB/USAID etc. involving design of minimum two major bridge (length more than 200m).
iii)	Max. Age Limit	65 years on the date of submission of proposal

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5. Traffic Engineer

i)	Educational Qualification	
	Minimum	Graduate in Civil Engineering
ii)	Experience	
	a) Total Professional Experience	Min. 15 years
	Experience in Highway Projects	Min. 10 years on similar Project and an experience of Minimum 2 projects as a road safety auditor.
	Experience in similar Capacity	Traffic Engineer in Highway projects (NH/SH/Expressways)/ externally aided projects such as WB/ADB/USAID etc. involving 2 laning of aggregate length minimum 40% of the DPR package length.
iii)	Max. Age Limit	65 years on the date of submission of proposal

6. Material Engineering-Cum-Geo-Technical Engineer

i)	Educational Qualification	
	Minimum	Graduate in Civil Engineering
ii)	Experience	
	a) Total Professional Experience	Min. 15 years
	Experience in similar type of work in infrastructure Projects	Min. 8 years on similar Project in design and/or construction.
	Experience in similar Capacity	Material cum Geo-Technical Engineer on Highway projects (NH/SH/Expressways)/ externally aided projects such as WB/ADB/USAID etc. Of aggregate length minimum 40% of the DPR package length or more including at least one major bridge.
iii)	Max. Age Limit	65 years on the date of submission of proposal

7. Senior Survey Engineer

i)	Educational Qualification	
	Minimum	Graduate in Civil Engineering
ii)	Experience	
	a) Total Professional Experience	Min. 15 years
	Experience in similar type of work in infrastructure Projects	Min.12 years on similar Project in Project preparation and construction & through understanding of modern computer based methods of surveying.
	Experience in similar Capacity	Survey Engineer for Projects preparation of Highway projects (NH/SH/Expressways)/ externally aided projects such as WB/ADB/USAID etc. Involving 2 laning of Aggregate length minimum 40% of the DPR package length.
iii)	Max. Age Limit	65 years on the date of submission of proposal

8. Environment Specialist

i)	Educational Qualification	
	Minimum	Graduate Engineering with specialization in Environmental Engineering/MSC in Environmental Science
ii)	Experience	
	a) Total Professional Experience	Min. 15 years in relevant field.
	Experience in similar type of work in infrastructure Projects	Min.8 years in environment impact assessment of infrastructure projects/ externally aided projects such as WB/ ADB/USAID etc.
	Experience in similar Capacity	Environmental specialist in at least in at least two Highway Projects.
iii)	Max. Age Limit	65 years on the date of submission of proposal

9. Resettlement and Rehabilitation Specialist

i)	Educational Qualification	
	Minimum	Graduate in Social Science
ii)	Experience	
	a) Total Professional Experience	Min.10 years
	Experience in similar type of work in infrastructure Projects	Min.5 years on Highway infrastructure Projects.
	Experience in similar Capacity	R&R Expert for at least on Highway Project
iii)	Max. Age Limit	65 years on the date of submission of proposal

10. Quantity Surveyor/Documentation Expert

i)	Educational Qualification	
	Minimum	Graduate in Civil Engineering
ii)	Experience	
	a) Total Professional Experience	Min.15 years
	Experience in similar type of work in infrastructure Projects	Min.12 years in Preparation of Bill of Quantities, Contract Documents and Documentation for major Highway projects involving 2 laning.
	Experience in similar Capacity	Quantity Surveyor/Documentation expert in Highway projects (NH/SH/Expressways) involving 2 laning of aggregate length minimum 40% of the DPR package length.
iii)	Max. Age Limit	65 years on the date of submission of proposal

Appendix-B

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 – “A”

List of State Highways proposed to be up-graded under this project.

Sl No.	Road Name	Length (Km)	Group Length (Km)	Package	Cost of RFP (in ₹)	Bid Security (In ₹)	Time of Completion (in months)
1	Singhara on proposed Amas Darbhanga Road-Mahua-Vaishali Road	42	42	Package 9	5000	100000	4
2	High level Bridge & Approach Road on Hathouri-Atrar-Bavangama-Aurai Road	0.915	0.915	Package 12	5000	100000	4
3	SH 97 Atarbel (at NH57) – Jalley – Ghoghrachatti (at SH52) Road	31.70	31.70	Package 13	5000	100000	4

**Agreement & General Conditions of Contract
CONTENTS**

Sl. No.	Description	Page No.
	I. CONTRACT FOR CONSULTANT’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	
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- Appendix A: List of State Highways /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: Financial proposal/Minutes of Financial/ Contract Negotiations with the Consultant, if any.
- Appendix D: Copy of letter of invitation
- Appendix E: Copy of letter of Award/Acceptance/Work Order
- Appendix F: Copy of Bank Guarantee for Performance Security
- Appendix G: Minutes of the Pre-bid meeting

CONTRACT FOR CONSULTANTS' SERVICES

Consultancy Services for preparation of Detailed Project Report for Rehabilitation and Upgrading of existing road [*insert name of the road*].

This CONTRACT (hereinafter called the "Contract") is made on the ----- day of the month of ---
-----20--, between, on the one hand, ----- (EMPLOYER), (hereinafter called the
"Employer/ EMPLOYER") and, on the other hand,-----
----- (hereinafter called the "Consultants").

WHEREAS

- (A) the Employer has requested the Consultants to provide certain consulting services as defined in the General Conditions attached to this Contract (hereinafter called the "Services");
- (B) the Consultants, having represented to the Employer 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:

- (a) The General Conditions of Contract (hereinafter called "GC");
- (b) The Special Conditions of Contract (hereinafter called "SC");
- (c) The following Appendices:

Appendix A: List of State Highways /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: Financial proposal/Minutes of Financial/ Contract Negotiations with the Consultant, if any.

Appendix D: Copy of letter of invitation

Appendix E: Copy of letter of Award/Acceptance/Work Order

Appendix F: Copy of Bank Guarantee for Performance Security

Appendix G: Minutes of the Pre-bid meeting

2. The amount in local currency is Rs.(Rs.) per KM, inclusive of all taxes i.e forKM . The total current amount in local currency is RS., **Road Project, (Pkg-09 & 13)** and offer a Rate of Rs.----- (Rupees-----only) Lump sum. for the **Bridge Project including Approaches, (Pkg- 12)** inclusive of all Indian taxes(direct and indirect taxes) including GST and other applicable Taxes inclusive of all taxes. However the actual length may be changed as per site condition and payment will be made accordingly.

2.1 Currency:- indian

3. The mutual rights and obligations of the Employer 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

CONSULTANT

(b) Employer 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
(Employer)
Bihar State Road Development Corporation Limited, Patna.

Witness
1. Signature
Name
Address

By Authorised Representative

2. Signature
Name
Address

FOR AND ON BEHALF OF
(Consultant)

Witness
1. Signature
Name
Address

By Authorised Representative

2. Signature
Name
Address

GENERAL CONDITIONS OF CONTRACT

1. GENERAL PROVISIONS

1.1 Definitions

Unless the context otherwise requires, the following terms whenever used in this Contract have the following meanings:

- (a) “Applicable Law” means the laws and any other instruments having the force of law.
- (b) “Contract” means the Contract signed by the Parties, to which these General Conditions of Contract are attached, together with all the documents listed in Clause 1 of such signed Contract;
- (c) “Effective Date” means the date on which this Contract comes into force and effect pursuant to Clause GC 2.1;
- (d) “GCC” means these General Conditions of Contract;
- (e) “Government” means the Government of Bihar;
- (f) “currency” means the Indian National Rupee;
- (g) “Member”, in case the Consultants consist of a joint venture 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 as approved by EMPLOYER 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 Employer 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;
- (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 Employer, the Consultants or a Sub-consultant.
- (o) “SC” means the Special Conditions of Contract by which these General Conditions of Contract may be amended or supplemented;

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 Employer 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 Law Governing the Contract

This Contract, its meaning and interpretation, and the relation between the Parties shall be governed by the Applicable Law as prevalent in India.

CONSULTANT**1.4 Language**

This Contract has been executed in English, which shall be the binding and controlling language for all matters relating to the meaning or interpretation of this Contract.

1.5 Heading

The headings shall not limit, alter or affect the meaning 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, telex, telegram or facsimile to such Party at the address as 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 at the address mentioned as under

Employer :	Consultant:
Chief General Manager Bihar State Road Development Corporation Limited RCD Central Mechanical Workshop Campus, Near Airport Sheikhpura, Patna-800014 Tel;-2226711 Fax;-2226723	

1.7 Location

The Services shall be performed at such locations as are specified in TOR.

1.8 Authority of Member in Charge

In case the Consultants consist of a joint venture of more than one entity, the Members hereby will authorize an entity to act on their behalf in exercising the entire Consultants' rights and obligations towards the Employer under this Contract, including without limitation the receiving of instructions and payments from the Employer.

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 Employer or the Consultants may be taken or executed by the authorized representative.

1.10 Taxes and Duties

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 Employer's notice to the Consultants instructing the Consultants to begin carrying out the Services.

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 two (2) months 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.

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2.3 Commencement of Services

The Consultants shall begin carrying out the Services at the end of such time period after the Effective Date.

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.

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

CONSULTANT

- (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 Maguire 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 related to force majeure

Both the parties will have to bear their own cost during the force majeure.

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 Employer 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 Employer**

The Employer 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 hereunder, 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 Employer 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) 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;

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- (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 Employer a statement which has a material effect on the rights, obligations or interests of the Employer 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 Employer, 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 Employer, 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 Employer 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 Employer 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 Employer 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 Employer 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 Employer, the Consultants shall proceed as provided, respectively, by Clauses 3.9 or 3.10 hereof.

2.9.5 Payment upon Termination

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Upon termination of this Contract pursuant to Clauses 2.9.1 or 2.9.2 hereof, the Employer shall make the following payments to the Consultants (after offsetting against these payments any amount that may be due from the Consultant to the Employer):

- (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

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 hereunder with all due diligence, efficiency and economy, in accordance with generally accepted professional techniques and practices, and shall observe sound management practices, and employ appropriate advanced technology and safe and effective equipment, machinery, materials and methods. The Consultants shall always act, in respect of any matter relating to this Contract or to the Services, as faithful advisers to the Employer, and shall at all times support and safeguard the Employer'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 Subconsultants, as well as the Personnel and agents of the Consultants and any Subconsultants, comply with the Applicable Law. The Employer 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 Subconsultants, 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 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 by Employer.

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 relating to the Project, the Services, this Contract or the Employer's business or operations without the prior written consent of the Employer.

3.3 Liability of the Consultants

The Consultants' liability under this Contract shall be as provided by the Applicable Law.

3.4 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 Employer, insurance against the risks, and for the coverage's, as necessary and (ii) at the Employer's request, shall provide evidence to the Employer showing that such insurance has been taken out and maintained and that the current premiums there for 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 Employer 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 Employer.

3.7 Consultants' Actions requiring Employer's prior Approval

The Consultants shall obtain the Employer'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

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the subcontract shall have been approved in writing by the Employer 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;

3.8 **Reporting Obligations**

The Consultants shall submit to the Employer the reports and documents specified in **Appendix** 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 Employer**

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 Employer, and the Consultants shall, not later than upon termination or expiration of this Contract, deliver all such documents to the Employer, together with a detailed inventory thereof. The Consultants may retain a copy of such documents.

3.10 **Equipment and Materials furnished by the Employer**

Equipment and materials made available to the Consultants by the Employer, or purchased by the Consultants with funds provided by the Employer, shall be the property of the Employer and shall be marked accordingly. Upon termination or expiration of this Contract, the Consultants shall make available to the Employer an inventory of such equipment and materials and shall dispose of such equipment and materials in accordance with the Employer's instructions. While in possession of such equipment and materials, the Consultants, unless otherwise instructed by the Employer 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 minimum engagement of the key professionals is to be adhered.
- (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 personnels is to be increased. The consultant will have to take into account the requirement of personals and other relevant infrastructure required for timely completion of the project. Based on assessment of required professional, equipments and other infrastructure the consultant should quote the rates per kilometer.
- (c) If additional work is required beyond the scope of the Services specified in TOR, the remuneration shall be fixed on mutually agreed terms.

4.3 **Approval of Personnel**

In respect of Key Personnel, which the Consultants propose to use in the carrying out of the Services, the Consultants shall submit to the Employer for review and approval a copy of their biographical data. If the Employer 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 Employer.

CONSULTANT

4.4 Working Hours, Overtime, Leave, etc.

Working hours and holidays for Key Professional shall be as per labour laws.

4.5 Removal and/or Replacement of Personnel

- (a) Once approved by the Employer no changes shall be made in the Key Personnels. If, for any reason beyond the reasonable control of the Consultants, it becomes necessary to replace any of the key Personnel, the Consultants shall forthwith provide as a replacement a person of equivalent or better qualifications.
- (b) If the Employer (i) finds that any of the key Personnel has committed serious misconduct or has been charged with having committed a criminal action, or (ii) has reasonable cause to be dissatisfied with the performance of any of the key Personnel, then the Consultants shall, at the Employer's written request specifying the grounds therefore, forthwith provide as a replacement of the person with qualifications and experience acceptable to the Employer. Any such replacement shall be at risk & cost of the consultant.

4.6 Resident Project Manager

The Consultants shall ensure that at all times during the Consultants' performance of the Services a resident project manager, acceptable to the Employer, shall be in charge of the performance of such Services.

5. OBLIGATION OF THE EMPLOYER**5.1 Assistance and Exemptions**

The Employer shall use its best efforts to ensure that the EMPLOYER shall:

- (a) assist the Consultants, Sub consultants and Personnel in arranging 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 clearance through customs of any property required for the Services;
- (d) issue to officials, agents and representatives of the agency all such instructions as may be necessary or appropriate for the prompt and effective implementation of the Services;

5.2 Access to Land

The Employer warrants that the Consultants shall have, free of charge, unimpeded access to all land in respect of which access is required for the performance of the Services. The Employer 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

The consultant shall bear all financial implication, if, after the date of this Contract, there is any change in the Applicable Law with respect to taxes and duties.

5.4 Services, Facilities and Property of the Employer

The Employer shall make available to the Consultants and the Personnel, for the purposes of the Services and free of any charge, the services and facilities as mentioned in clause 5.1 and 5.2.

5.5 Payment

CONSULTANT

In consideration of the Services performed by the Consultants under this Contract, the Employer 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 The payment shall be made as per clause 10.1 mentioned in TOR.

6.2 The payment shall be made through A/c payee cheque, payable at Patna, 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 Employer shall cause to be paid to the Consultants an advance and as otherwise set forth below. The advance payment will be due after provision by the Consultants to the Employer of a bank guarantee of any nationalised bank acceptable of value of 10% of total contract value. Such bank guarantee (i) to remain effective until the advance payment has been fully set off and ii) in such form as the Employer 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.	Description	Payment
1	On submission and approval of Stage-I Report	10%
2	On Submission and approval of Stage-2 reports	20%
3	On Submission and approval of Stage-3 report	30%
4	On finalization of Stage-3 reports based on comments of the Employer, and submission of Stage-4 Report and other documents	30%
5	On acceptance of Stage-4 documents, finalization of Addenda for the bidders and fulfillment of other scope of work under TOR	10%
	Total	100%

(c) No payment shall become eligible for the next stage till the consultant completes to the satisfaction of the Employer the work pertaining to the preceding stage.

(d) The Employer 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 Employer of bills.

(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 Employer. The Services shall be deemed completed and finally accepted by the Employer and the final report and final statement shall be deemed approved by the Employer as satisfactory ninety (90) calendar days after receipt of the final report and final statement by the Employer unless the Employer, within such ninety (90) day period, gives written notice to the Consultants specifying in detail deficiencies in the Services, the final report or final statement. The Consultants shall thereupon promptly make any necessary corrections, and upon completion of such corrections, the foregoing process shall be repeated. Any amount which the Employer 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 Employer within

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thirty (30) days after receipt by the Consultants of notice thereof. Any such claim by the Employer for reimbursement must be made within twelve (12) calendar months after receipt by the Employer of a final report and a final statement approved by the Employer in accordance with the above.

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 Employer against any inaccuracy / deficiency in the designs and drawings of the bridges and structures noticed during the construction and even thereafter and the Employer 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 in the form of performance BG for accuracy of design and quantities submitted and the same will be released after the completion of civil contract works.

7.3. Penalty**7.3.1. Penalty for Error/Variation**

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.

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.

7.4 ACTION FOR DEFICIENCY IN SERVICES**7.4.1 Consultants liability towards the Employer**

Consultant shall be liable to indemnify the Employer 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 EMPLOYER, other penal action including debarring for certain period may also be initiated as per policy of EMPLOYER.

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.

If the dispute(s) is not resolved amicably then it shall be referred to arbitration and shall be dealt as per the provisions of the arbitration & conciliation Act 1996.

10. Performance Security

The consultant will furnish within 10 days of the issue of Letter of Acceptance (LOA), an unconditional Bank Guarantee from the Bank Nationalized/ Scheduled as per Appendix –J for an amount equivalent to 10% of the total contract value to be received by him towards Performance Security valid for a period of one year beyond the date of completion of services. The Bank Guarantee (shall be extendable till the completion of civil contract works) will be released by BSRDCL, PATNA, BIHAR upon successful completion of civil contract and rectification of errors if any, found during implementation of the contract for civil work and satisfactory report by supervision consultant/PIU staff engaged by BSRDCL,PATNA.

SPECIAL CONDITIONS OF CONTRACT**Number of
GC Clause****A. Amendments of, and Supplements to, Clauses in the General Conditions****1.6.1** The addresses are:

For the Client : **Chief General Manager**
Bihar State Road Development Corporation Limited
RCD Central Mechanical Workshop Campus, Near Airport
Sheikhpura, Patna-800014
Tel;-2226711 Fax;-2226723

For the Consultants:

Attention :

1.6.2 Notice will be deemed to be effective as follows:

- (a) in the case of personal delivery or registered mail or courier, on delivery;
- (b) In the case of telegrams, 24 hours following confirmed transmission; and
- (c) In the case of facsimiles, 24 hours following confirmed transmission.

2.2 The time period shall be “One month” or such other time period as the parties may agree in writing.

APPENDIX- I**BID SECURITY
(BANK GUARANTEE FORMAT)**

WHEREAS, _____ [name of Bidder] (hereinafter called "the Bidder") has submitted his Bid dated _____ [date] for the DPR of _____ [name of Contract hereinafter called "the Bid"].

KNOW ALL PEOPLE 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 _____ * for which payment well and truly to be made to the said Employer the Bank itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this _____ day of _____, 20____

THE CONDITIONS of this obligation are :

- (1) If after Bid opening the Bidder withdraws his bid during the period of Bid validity specified in the Form of Bid;

OR

- (2) If the Bidder having been notified to 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 Instructions to Bidders; or

We undertake to pay to 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 two conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date _____** 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.

DATE _____
SIGNATURE _____

WITNESS _____ [Signature, name and address] SEAL_

* The Bidder should insert the amount of the guarantee in words and figures denominated in Indian Rupees.

** 45 days after the end of the validity period of the Bid. Date should be inserted by the Employer before the Bidding documents are issued.

APPENDIX- J**FORM OF BANK GUARANTEE FOR PERFORMANCE SECURITY**

Ref: _____ Bank Guarantee: _____

Date: _____

To,

The Chief General Manager

BSRDCL, EXTERNAL FUNDING AGENCY Projects

Patna,Bihar**Dear Sir,**

In consideration of “Bihar State Road Development Corporation Ltd., Patna, Bihar” (hereinafter referred as the “Employer”, which expression shall, unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to M/s. _____ (hereinafter referred to as the “Consultant” which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns), a contract by issue of Employer’s LoA Letter No. _____ dated _____ and the same having been unequivocally accepted by the Consultant, resulting in a Contract valued at _____ for **(name of the project)** _____ (hereinafter called the “Contract”) and the Consultant having agreed to furnish a Bank Guarantee to the Employer against the Performance Security as stipulated by the Employer in the said contract for accuracy of the services performed amounting to Rs. _____ (in words and figures)”

We _____ (Name of the Bank) having its Head Office at _____ (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 Employer immediately on demand any or, all amount payable by the Consultant to the extent of _____ as aforesaid at any time upto _____ @ _____ without any demur, reservation, contest, recourse or protest and/or without any reference to the consultant. Any such demand made by the Employer on the Bank shall be conclusive and binding notwithstanding any difference between the Employer 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 Employer discharges this guarantee.

The Employer shall have the fullest liberty without affecting in any way the liability of the Bank under this Guarantee, from time to time to vary it or to extend the time for performance of the contract by the Consultant. The Employer 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 Employer and to exercise the same at any time in any manner, and either to enforce or to forebear to enforce any covenants, contained or implied, in the Contract between the Employer and the Consultant any other course or remedy or security available to the Employer. The bank shall not be relieved of its obligations under these presents by any exercise by the Employer 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 Employer or any other indulgence shown by the Employer 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 Employer 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 Employer may have in relation to the Consultant’s liabilities.

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Notwithstanding anything contained herein

A) Our liability under this guarantee is limited to Rs. _____ (Amount in Words) and it shall remain in force upto and including dateand 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.

B)

C) This bank Guarantee Shall be valid up to.....

D)

E) 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).

F)

Dated this _____ day of _____ 20_____ at _____

WITNESS

(signature) (signature)

(Name) (Name) _____

(Official Address) Designation (with Bank stamp)

Attorney as per Power of

Attorney No. _____

Dated _____

Note 1: The date of validity of BG will be One Year after the date of commencement of services. However its validity should be extendable if requested by BSRDCL,Patna,Bihar

Note 2: The stamp papers of appropriate value shall be purchased in the name of bank that issues the "Bank Guarantee".

Note 3: The Bank Guarantee will be accepted which is issued by State Bank of India or its subsidiaries or any Nationalized/Scheduled Bank of India

Note 4:- The Bank Guarantee has to be linked to the Employer Bank Account through SFMS.

Name of Beneficiary – Bihar Ste Road Development Corporation Ltd.

Name of bank – Canara bank; Patliputra Colony, Patna

Account No. – 2518101005873

IFSC Code – CNRB0002518