



EXPRESSION OF INTEREST (EOI)

Title of Consulting Service: Detailed Survey, Soil Investigation, Hydrological Study, Detailed Design and Report Preparation of Various Motorable Bridges

DoLID/RBS/DPR/EOI-01/2083/84
Method of Consulting Service: National

Project Name: Procurement of Consulting Services for Detailed Engineering Survey, Soil Investigation, Hydrological Study and Detailed Engineering Design of Motorable Bridges

EOI: DoLID/RBS/DPR/EOI-01/2083/84

**Office Name: Department of Local Infrastructure Development
Road & Bridge Section**

Office Address: Shreemahal, Pulchowk

Funding agency: Government Budget



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A. Request for Expression of Interest



Request for Expression of Interest

Government of Nepal (GoN)

Ministry of Infrastructure Development

Department of Local Infrastructure Development

Road & Bridge Section

Notice No: DoLID/RBS/EoI-01/2082/83

Date of Publication: 2083/06/30 B.S.

Name of Project: Procurement of Consulting Services for Detailed Engineering Survey, Soil Investigation, Hydrological Study and Detailed Engineering Design of Motorable Bridges.

1. Government of Nepal (GoN) has allocated fund toward the cost of Procurement of Consulting Services for Detailed Engineering Survey, Soil Investigation, Hydrological Study and Detailed Engineering Design of Motorable Bridges and intend to apply portion of this fund to eligible payments under the Contract for which this Expression of Interest is invited for National consulting service.
2. Department of Local Infrastructure Development now invites Expression of Interest (EOI) from eligible consulting firms ("consultant") to provide the following consulting services: Consulting Services for Detailed Engineering Survey, Soil Investigation, Hydrological Study and Detailed Engineering Design of Motorable Bridges.

S.No	Contract Number	Detailed Engineering Survey, Soil Investigation Hydrological Study and Detailed Design of following bridge(s)
1	DoLID/RBS/Br-DPR-01/2083-84	मेचीनगर न.पा. वडा नं. १ तिरिगा खोला पुल निर्माण; झापा जिल्ला अर्जुनधारा न.पा. वडा नं. ५ त्यहाँ चारपाने-नारायण चोक सडक अन्तर्गत बहादुर आउँ जोड्ने सडकमा पक्की पुल निर्माण करेब २० मिटर; चकचकी बजार पूर्व घाघा खोलामा पक्की पुल, बाह्रदशी-४; कुटि बजार पूर्व अदुवा खोलामा पक्की पुल निर्माण, कचनकवल-१; चौवालिसघरे पूर्व बिर्तामोड नगरपालिका जोड्ने अदुवा खोलामा पक्की पुल निर्माण, बाह्रदशी-६; बनियानी खोला पुल, शिवसताक्षि ४-५, सालमारा; शिवसताक्षि -०९ शिव प्रावि पुल; जमुना नदी पक्की पुल, कचनकवल-१, ३ झापा; खुवा खोला गौरादह ५ झापा; किस्ने खोला पुल गौरीदह ७, ८ झापा
2	DoLID/RBS/Br-DPR-02/2083-84	कन्चनरूप नगरपालिका वडा नं ११ पर्ने गिदहाको वभना खोलाको पुल निर्माण, सप्तरी; अगिनसाइर कृष्णा सरवन पालिका वडा नं ४ को कलिया खोला, सप्तरी; जीता नदीमा पक्कीपुल निर्माण, हनुमाननगर कंकालिनी न.पा-१४; रुपनी देखि भलुवाही जाने बाटोमा पर्ने दमडा खोलामा पक्की पुल, रुपनी गाँउपालिका; कविलासा स्थित जुडी नदीमा मोटेरेवल पुल; बरदाही - कुदुन्मा जोड्ने मुतनी नदि मोटेरेवल पुल; लक्ष्मीपुर पतारी गाउँपालिका वडा नं. ५ अन्तर्गत खुरकियाही गाउँ देखि पश्चिम वडा नं. ३ हरिनगर गाउँजाने बाटोमा कटनिया नदीमा पक्की पुल; लहान वडा नं. १५ बिरनगर देखि मोहनपुर सडकमा मुत्ती खोलामा पुल; सरे खोला पुल धनगढीमाइ न.पा-१२; गागन खोला पुल सुखिपुर न.पा-८
3	DoLID/RBS/Br-DPR-03/2083-84	बेल्ही देखि रामनगर जाने सडकमा सशस्त्र बेस क्याम्प नजिक सडक पुल; बिहुल खोलामा सडक पुल (पटेरेवा रामपुर जोड्ने सुरुङ्गा १० र ११); चापिन नदिमा सडकपुल (खडक न.पा १ सिस्वा बेल्ही र २ दुहवी दक्षिण); खडक नदीमा सडकपुल (कल्याणपुर बजार देखि उत्तर); अग्नीसाइर कृष्णासरवन पश्चिम टोल पुल (वार्ड नं. २); हनुमाननगर कंकालिनी भन्सारको विचम थान नजिक सडक पुल (वडा नं १४); बेल्ही-कुशहा सडकमा हेल्थपोष्ट नजिकको सडकपुल, बलान बिहुल गा.पा-४; बेल्ही-टिकुलिया जाने बाटोमा पर्ने नदीमा सडकपुल (बलानबिहुल गा.पा ४); सुखलाही खोला पक्की पुल (सुरुङ्गा न.पा-३, ४); पथराहा खोला पक्की पुल (सुरुङ्गा न.पा -८, ११)
	DoLID/RBS/Br-DPR-04/2083-84	नख्खु खोला मोटेरेवल पुल (गोदावरी न.पा. ११ शेराफाँट र ९ चाम्पी जोड्ने); हनुमन्ते खोला



4		पुल (शुर्पाविनायक-३ हनुमन्ते कोरिडोर र मध्यपुर ठिमि नपा-३, ४ जोड्ने);बखेखोला पुल (चाँगुनारायण फास्टट्रयाक अन्तर्गत);मनहरा नदी सडकपुल (मुलपानी भक्तपुर);गुभु खोला पक्की पुल (चाँगुनारायण न पा);हनुमन्ते पुल (नयाँ ठिमिबाट ददिकोट जाने);नगरकोट-सुनटोल पक्की पुल (चाँगुनारायण नपा-०६, नगरकोट);गाखुशी सडकपुल निर्माणकार्य शुर्पाविनायक न.पा-९, नखेल, भक्तपुर;रोजवर्ड स्कुल अगाडिको पुल निर्माण (कामपा १५, १६ चमति जोड्ने);बलम्बु मुल खोला मोटर पुल (चन्द्रागिरी १ र १२ जोड्ने, सृजना चोक निस्कने)
5	DoLID/RBS/Br-DPR-05/2083-84	सेती नदी पुल (सुकला गण्डकी) ; गाँछेपानी सेती नदी पक्कीपुल (शुक्ला गण्डकी २, ९) ; म्याग्दे खोला पुल (घरौली रिडेपानी जोड्ने, वडा नं. ५) ; सिर्दी खोला पुल (आँबुखैरेनी छिम्केश्वरी सडकखण्ड) ; कुमले खोला पुल (तीन खोला देवी मोटर मार्ग, शुक्लागण्डकी) ; सर्वदा खोला पुल (कालीमाटी भानु-११ र रुपाकोट चौकी भानु-११ जोड्ने) ; खाल्टेखोला मोटरेवल पुल (रुपा गापा-४) ; सुरौंदि खोला कोर्लिङ पक्कीपुल (कदमबोट, पोखरा -३३) ; मोदिखोला मोटरेवल पुल (अन्नपूर्ण ७ र १० चक्रपथको घान्द्रुक र लान्द्रुक जोड्ने) ; सेती दोविल्ला घाट पुल (पोखरा २५ र पोखरा १९ जोड्ने) ; पुतलीबजार न.पा-६ र पोखरा महानगरपालिका जोड्ने बाँसपानी ठूलाचौर हलेदे ग्रमीण कच्ची सडकमा पर्ने थालबुडे घाटमा मोटरेवल पुल
6	DoLID/RBS/Br-DPR-06/2083-84	मध्यविन्दु न.पा.४ र ५ जोड्ने उल्टिखोला पुल; देवदह ८ टटेरा देखि देवदह ९ घोडाहा जोड्ने पुल; देवदह ४ प्रगति टोल देखि पूर्व देवदह ३ गौरी टोल जोड्ने पुल; देवदह ६ केउली देखि सटरखोला जोड्ने पुल; बुटवल-२ मैनाबगर ५४ फुटे बाटो हुदै श्रीराम नगर र बुटवल -१३ जोड्ने पुल; बुटवल ७ र ८ जोड्ने सुखैरा खोला पुल; बुटवल-१४ पदमपुर, हरियाली टोलदेखि बुटवल-१३ बेलबास स्थित यातायात व्यवस्था कार्यालय जोड्न दानव नदीमा पुल निर्माण; शुद्धोधन गापा रुपन्देही वडा ६ नागेश्वर टोलदेखि शुद्धोधन गापा वडा १ बेलवा जाने पुल निर्माण; विचौवापुरको कोठी नदीको रुपन्देही देखि कपिलवस्तु जोड्ने पक्की पुल; नयाँगाउँदेखि सैनामैना वडा ४ कर्माहवा पुल; सुपैला खोला पुल-गढवा ३ दाड; लमही चाक्ली घाट जाने अर्जुन खोला पुल; खजुरा गापा मनकामनापुर दुर्गा कालिका मन्दिर नजिक पेडारी नालामा पुल
7	DoLID/RBS/Br-DPR-07/2083-84	भुतगाड खोला सडकपुल ठाटिकाँद ३ र ४ दैलेख-२; रति खोला मोटर रेवल पुल पुनाकोट गुराँस गाउँपालिका ३ र ४ जोड्ने; विविखोला मोटरेवल पुल, नारायण नगरपालिका र नौमुले गा.पा., दैलेख; हनेटाखोला मोटरेवल पुल, डुंगेश्वर गा पा ३ र गुराँस ७, दैलेख; तिदुघाट मोटरेवल पुल कट्टीखोला, भगवतीमाई १ र ६, दैलेख; तुसुखोला मोटरेवल पुल, भगवतीमाई ३ र ६, दैलेख; विउराखेत मोटरेवल पुल, डुंगेश्वर ४ र ६, दैलेख; पुनतडा मर्के मोटरेवल पुल, गुराँस ६ र ७, दैलेख; हाटी खोला पुल (नौमुले गा.पा ३); नाभिस्थान खोला पुल (गमौडी, नाभिस्थान, शिरस्थान, दुल्लु १० र भैरवि-१); रतिखोला लोहोरे नदि सडक पुल (दुल्लु नपा १३ र गुराँस गापा २ जोड्ने, महुवा-२)
8.	DoLID/RBS/Br-DPR-08/2083-84	कोइलही र सिमरानाको बिचमा पर्ने घुराहा नदीमा सडकपुल, कैलाली; डमौलीया शिवगंगा नदिमा सडकपुल; बेलडाँडी गाउँपालिका नं. २ र ३ वडाहरु जोड्ने पुल ,बेलडाडी गाउँपालिका-२ ,कञ्चनपुर ; रिलु खोला पक्की पुल निर्माण ,मष्टा गाउँपालिका-६ ,बझाङ; बल्दे-आटिचौर सडक अन्तर्गत सुर्का खोलामा मोटरेवल पुल निर्माण ,बडीमालिका नगरपालिका-१ ,बाजुरा; सुन्दरनगर जोड्ने पुल ,दोधारा चाँदनी नगरपालिका-८ ,कञ्चनपुर,; मटेला सडक पुल भत्काडा रेल सडक, गन्यापधुरा १, डडेलधुरा; सिलंगी बेगरीगाड बैडाँ सडक पुल, अजयमेरू , डडेलधुरा; घुम्ती चिरकिट्टे रंगुन सडकपुल, आलिताल ८, डडेलधुरा; DPR तयार तथा वातावरणीय अध्ययन कार्य

3. Interested eligible consultants may obtain further information at the address Road & Bridge Section, DoLID, Lalitpur during office hours on or before the last date of submission of EOI. The EOI Document can be obtained from the Road & Bridge Section, DoLID or visit the website www.doli.gov.np from 2083-06-30 B.S to 2083-07-



13 B.S. during office hours.

4. Consultants may associate with other consultants to enhance their qualifications.
5. Expressions of interest shall be delivered manually in the sealed envelope on or before 2083-07-16 B.S. 12:00 Noon.
6. The EoI shall be opened on 2083-07-16 B.S. at 13:00 Hours in the presence of the Consultant who happens to be there at the place of opening.
7. In case the last date of obtaining and submission of the EOI documents happens to be a holiday, the next working day will be deemed as the due date but the time will be the same as stipulated.
8. EOI will be assessed based on **Qualification 30.00 %, Experience 60.00 %, and Capacity 10.00 %** of consulting firm and key personnel. Based on evaluation of EOI, only shortlisted firms will be invited to submit technical and financial proposal through a request for proposal.
9. Minimum score to pass the EOI is 60.
10. The last date of submission of EOI is:-**2083-07-16 B.S.** at 12:00 Noon in the Road & Bridge Section, DoLID.



B. Instructions for Submission of Expression of Interest (EoI)



Instructions for Submission of Expression of Interest

1. Expression of Interest may be submitted by a sole firm or a joint venture of consulting firms and the maximum number of partners in JV shall be limited to three.
2. Interested consultants must provide information indicating that they are qualified to perform the services (descriptions, organization and employee and of the firm or company, description of assignments of similar nature completed in the last 7 years and their location, experience in similar conditions, general qualifications and the key personnel to be involved in the proposed assignment).
3. This expression of interest is open to all eligible consulting firm/person/company/organization.
4. The assignment has been scheduled for a period of 7 months. Expected date of commencement of the assignment is
5. A Consultant will be selected in accordance with the QCBS method.
6. Expression of Interest should contain following information:
 - (i) A covering letter addressed to the representative of the client on the official letter head of company duly signed by authorized signatory.
 - (ii) Applicants shall provide the following information in the respective formats given in the EOI document:
 - EOI Form: Letter of Application (Form 1)
 - EOI Form: Applicant's Information (Form 2)
 - EOI Form: Work Experience Details (Form 3(A), 3(B) & 3(C))
 - EOI Form: Capacity Details (Form 4)
 - EOI Form: Key Experts List (form 5).
7. Applicants may submit additional information with their application but shortlisting will be based on the evaluation of information requested and included in the formats provided in the EOI document.
8. The Expression of Interest (EOI) document must be duly completed and submitted through e-GP system by using the forms and instructions provided by the system.
9. The completed EOI document must be submitted on or before the date and address mentioned in the "Request for Expression of Interest". In case the submission falls on public holiday the submission can be made on the next working day. Any EOI Document received after the closing time for submission of proposals shall not be considered for evaluation.



C. Objective of Consultancy Services or Brief TOR



D. Evaluation of Consultant's EOI Application



Evaluation of Consultant's EOI Application

Consultant's EOI application which meets the eligibility criteria will be ranked on the basis of the Ranking Criteria. A maximum of 6 consultants shall be short listed for each package.

i) Eligibility Criteria

Sl. No.	Criteria Title
1	Corporate Registration.
2	Tax Clearance Certificate of FY 2082/83 or Tax Return Submission Letter of Time Extension for Tax Return Submission up to FY 2082/83.
3	VAT/PAN Registration.
4	EOI Form 1: Letter of Application.
5	EOI Form 2: Applicant's Information Form or related documents.
6	EOI Form 3: Experience (3(A) and 3(B)) or related General, Specific work experience certificates.
7	EOI Form 4: Capacity or Tax clearance certificates
8	EOI Form 5: Qualification of Key Experts or related CV documents.
9	In case of a natural person or firm/institution/company which is already declared blacklisted and ineligible by the Government of Nepal, any other new or existing firm/institution/company owned partially or fully by such Natural person or Owner or Board of director of blacklisted firm/institution/company; shall not be eligible consultant.
10	If the corruption case is being filed to Court against the Natural Person or Board of Director of the firm/institution /company or any partner of JV, such Natural Person or Board of Director of the firm/institution /Company or any partner of JV shall not be eligible to participate in procurement process till the concerned Court has not issued the decision of clearance against the Corruption Charges.
11	Year of standing minimum 5 years (At least Prime Firm in case of JV)
12	The Priority Form given in APPENDIX-B is mandatory. Failure to fill the mentioned Priority Form by the Firm/JV applying for more than one package shall be disqualified.
13	Adherence to code of Ethics and Anti-Corruption Policy.
14	Power of Attorney
15	JV Agreement in case of Firms in JV



ii. Evaluation Criteria

A) Technical Competence: 30

1	Qualification of Key Experts (Maximum Score=15)	1. Team Leader (Bridge /Structural engineer): Master's Degree in Bridge/Structural engineering or Equivalent. [Total=5 marks] 2. Environmentalist/Forestry Specialist/Ecologist: Master's Degree in environmental science/Environmental engineering or equivalent. [Total =3 marks] 3. Geologist/Eng. Geologist/ Geo-Technical Engineer: Master's Degree in Geology/Geotechnical engineering or Equivalent [Total =3 marks] 4. Hydrologist: MSc. in Hydrology/Water resource engineering. [Total =3 marks] 5. Road/ Highway Engineer: Bachelor in Civil Engineering or equivalent [Total 1 marks]
2	Experience of Key Experts (Maximum Score=15)	1. <u>Team Leader (Bridge /Structural engineer):</u> - General Experience: Minimum 10 - Maximum 15 Years or more. (if <10, score=0, if >=10 and <=15, score=1.5, if >=15, score=2.5) - Specific Experience: - Design of up to 10 or more motorable bridges (0.25 for each bridge, with maximum score of 2.5) 2. <u>Environmentalist/Forestry Specialist/Ecologist:</u> - General Experience: Minimum 5 – Maximum 7 Years or more (if <5, score=0, if >=5 and <=7, score=1, if >=7, score=1.5) - Specific Experience: - Involved in preparation of BES, IEE, EIA of bridges up to 10 or more (0.15 score for each bridge, with maximum score of 1.5) 3. <u>Geologist/Eng. Geologist/ Geo-Technical Engineer:</u> - General Experience: Minimum 5 – Maximum 7 Years or more (if <5, score=0, if >=5 and <=7, score=1, if >=7, score=1.5) - Specific Experience: - Soil Investigation and design of foundation of up to 10 or more motorable bridges. (0.15 score for each bridge, with maximum score of 1.5) 4. <u>Hydrologist:</u> - General Experience: Minimum 5– Maximum 7 Years or more. (if <5, score=0, if >=5 and <=7, score=0.5, if >=7, score=1) - Specific Experience: - Hydrological analysis of up to 10 or more bridges) (0.10 score for each bridge with maximum score of 1).



5. Road/Highway Engineer:

General Experience: Minimum 5– Maximum 7 Years or more.

(if <5, score=0, if ≥5 and ≤7 score=0.5, if >7, score=1, with maximum score of 1)

- Specific Experience: (Detailed Engineering Survey of up to 4 or more bridges)

(0.25 score for each bridge with maximum score of 1)



B. Experience: 60		
Sl. No.	Criteria	Minimum Requirement
1	General Experience of consulting firm (Maximum Score=10)	- Completion of any Civil Engineering Related Services (Service Cost more than NRs. 20 Lakhs excluding VAT within the last 7 years.) [Total=10 marks, 2 marks for each job]. - No point shall be awarded if the contract amount is not mentioned in the experience certificate.
2	Specific experience of consulting firm within last 7 years. (Maximum Score=50)	- Completion of work of "Detailed Engineering Survey, Engineering Design, Drawing and preparation of DPR of motorable Bridges" for minimum contract amount of as stated below: excluding VAT (Single Package) within the last seven years. [Total=50 marks, 5 marks for each job] - Package 1: NRs. 84,00,000.00 - Package 2: NRs. 83,00,000.00 - Package 3: NRs 83,00,000.00 - Package 4: NRs 84,00,000.00 - Package 5: NRs 84,00,000.00 - Package 6: NRs 82,00,000.00 - Package 7: NRs 84,00,000.00 - Package 8: NRs. 83,00,000.00 - No point shall be awarded if the contract amount is not mentioned in the experience certificate.

C. Capacity:10		
Sl. No.	Criteria	Minimum Requirement
1	Financial Capacity of Firm (AAT) (Maximum Score=5 marks)	Min. Average Annual Turnover of best 3 year of last 7 fiscal years: [Total=5 marks] Package 1: NRs 1,57,00,000.00 Package 2: NRs 1,56,00,000.00 Package 3: NRS 1,56,00,000.00 Package 4: NRs 1,58,00,000.00 Package 5: NRs 1,58,00,000.00 Package 6: NRs 1,55,00,000.00 Package 7: NRs 1,57,00,000.00 Package 8: NRs. 1,57,00,000.00
2	Infrastructure/equipment related to the proposed assignment. (Maximum Score: 5 marks)	1. Soil Drilling equipment: 1.0 Marks for each set (Maximum 2 Marks) 2. Soil Lab Equipment (1. Shear Test, 2. Tri-axial Test, 3. Uniaxial compressive strength test, 4. Consolidation test, 5. DCP Test, 6. Permeability test, 7. Sieve) (1.5 Mark for each set) (Maximum 3 Marks)

Note: Minimum marks to pass shall be 60.



EOI Evaluation Criteria
Notes on Financial Capacity of Firm (Average Annual Turnover)

1. Average Annual Turnover of firm/JV shall be average of annual turnover of best 3 (three) fiscal years out of the last 7 (seven) fiscal years.
2. The firm and/or JV shall have to submit notary public attested tax clearance certificate of each fiscal year, supposed to be evaluated for EOI evaluation. Submission of audit report or any other tables shall not be considered for EOI evaluation. Notary public signature shall be verified, if required.
3. In case of JV business, the firm and/or JV shall have to submit notary public attested tax clearance certificate of each fiscal year along with the JV agreement of that business, supposed to be counted for EOI evaluation.
4. In case of JV, average annual turnover of the JV shall be evaluated considering % of financial liability as stated in the JV agreement for the EOI. If the JV agreement is submitted without mentioning the % of financial liability, the marks for financial capacity shall be evaluated to zero.
5. For the evaluation of financial capacity, inflation adjustment shall be done using overall wholesale price index (WPI computed at the end of last fiscal year) published by Nepal Rastra Bank.

Notes on Resource Personnel:

1. The proposed key personnel shall declare himself/herself that he / she is not involved full time in any civil engineering projects such as "Feasibility Study" or "Engineering / Construction Survey" or "Design" or "Construction Supervision" or "Preparation of DPR". In case of part time involvement of proposed key personnel, he / she shall provide adequate clarification and declaration regarding his/her part time involvement in any other above-mentioned projects does not affect the scheduling and execution of this consulting service if this consulting service is awarded to the firm hiring that proposed key personnel. Any marks allocated to the proposed key personnel shall not be awarded if he/she does not submit declaration (with clarification if needed) regarding above mentioned content through separate letter with signature of the proposed key personnel. Furthermore, in case of any written complaints registered at DoLID by any other consulting firm/JV, regarding the submission of fraudulent declaration, with supporting documents and proofs, the proposed key personnel shall not be considered in the evaluation process.
2. The year of experience of professional key, expert (whose minimum educational qualification is bachelor degree), shall be counted from the date of registration at Nepal Engineering Council (NEC) and whose minimum educational qualification is Master's Degree in such case the specific experience shall be counted from the date of issuance of Master's Degree Certificate. In case of non-engineering professional key expert, that shall be counted from the passed date as mentioned in educational qualification certificate (transcript).
3. CV of each professional key personnel shall be submitted with signature of professional key personnel and authorized representative of the firm/JV. Proposed professional key personnel shall not be repeated by more than one firm/JV. In case of repetition, Road & Bridge Section, DoLID shall ask, via letter, email, the person for his/her physical presence within three days to declare him/herself to the firm/JV whom he/she shall want to be associated CV of personnel shall clearly mention his/her e-mail address and mobile number.
4. The firm/JV shall have to submit the NEC registration certificate for engineer professionals.
5. The firm/JV shall have to submit any certificate as evidence of proposed key personnel's education (degree) as required above with his/her notarized academic certificate.



6. For Specific experience, jobs executed of only motorable bridges shall be counted.

Notes on Eligibility Criteria:

1. As per the provision made on clause 96(1) and clause 98 of Income Tax Act-2058, if the date of publication of notice lies within the first three months of running fiscal year. Consulting firm can submit their tax clearance certificate up to the second preceding fiscal year. Submission of letter of time extension for tax return submission is not mandatory for this duration. However, if the date of publication of notice is after first three months of running fiscal year, consulting firm shall submit their tax clearance certificate up to preceding fiscal year or tax clearance certificate up to second preceding fiscal year and letter of time extension for tax return submission.
2. Consulting Firms can form Joint Venture (JV) with maximum number of 3 (three) single entity firms. The submitted EOI document must clearly mention the name of the leading firm with financial liabilities.
3. Each firm is permitted to submit only one EOI either as a single entity or as a member of a joint venture for any particular package, failing which such firm shall not be shortlisted. The DoLID reserves the right to shortlist or not to short list any or all the firm(s) without assigning any reason whatsoever. Further information or clarification can be obtained from DOLID during office hours.
4. The firm/JV shall have to submit self-declaration letter.
5. In case of a firm which is already declared blacklisted and ineligible by the GoN shall not be eligible to submit an EOI.
6. In case, a corruption case is being filed to Court against the firm or any partner of JV. Such firm or JV shall be excluded from the evaluation, if public entity receives instruction from GoN.
7. The same firm shall not be allowed to submit EOI individually or in JV for same packages. ("Example 1: EOI submitted by Firm A and that submitted by Firm A JV with Firm B" - Not Allowed) ("Example 2: EOI submitted by Firm A JV with Firm B and that submitted by Firm B JV With Firm C"- Not Allowed).
8. Based on evaluation of EOI, only top 6 (six) ranked firms will be invited for RFP submission.
9. In case of two or more consulting firms' score the same marks, the ranking will be done based on the number of successfully completed motorable bridge design works.
10. Each consulting firm (either single entity or JV) shall fill up the attached priority firm (mandatory) for packages. If the consulting firm (either single or JV) qualify for more than 2 packages, the firm will be shortlisted in maximum two packages based on their priority list.



E. EOI Forms & Formats



E. EOI Forms & Formats

Form 1. Letter of Application

Form 2. Applicant's information

Form 3. Experience (*General, Specific*)

Form 4. Capacity

Form 5. Qualification of Key Experts

Form 6: ANNEX B



Standard EOI Document

1. Letter of Application

(Letterhead paper of the Applicant or partner responsible for a joint venture, including full postal address, telephone no., fax and email address)

Date:

To,

Full Name of Client: _____

Full Address of Client: _____

Telephone No.: _____

Fax No.: _____

Email Address: _____

Sir/Madam,

1. Being duly authorized to represent and act on behalf of (hereinafter "the Applicant"), and having reviewed and fully understood all the short-listing information provided, the undersigned hereby apply to be short-listed by **[Insert name of Client]** as Consultant for **[Insert brief description of Work/Services]**.
2. Attached to this letter are photocopies of original documents defining:
 - a) the Applicant's legal status;
 - b) the principal place of business;
3. **[Insert name of Client]** and its authorized representatives are hereby authorized to verify the statements, documents, and information submitted in connection with this application. This Letter of Application will also serve as authorization to any individual or authorized representative of any institution referred to in the supporting information, to provide such information deemed necessary and requested by yourselves to verify statements and information provided in this application, or with regard to the resources, experience, and competence of the Applicant.
4. **[Insert name of Client]** and its authorized representatives are authorized to contact any of the signatories to this letter for any further information.¹
5. All further communication concerning this Application should be addressed to the following person,

[Person]

[Company]

[Address]

[Phone, Fax, Email]
6. We declare that, we have no conflict of interest in the proposed procurement proceedings and we have not been punished for an offense relating to the concerned profession or

¹ Applications by joint ventures should provide on a separate sheet, relevant information for each party to the Application.



Standard EOI Document

Business and our Company/firm has not been declared ineligible.

7. We further confirm that, if any of our experts is engaged to prepare the TOR for any ensuing assignment resulting from our work product under this assignment, our firm, JV member or sub-consultant, and the expert(s) will be disqualified from short-listing and participation in the assignment.
8. The undersigned declares that the statements made and the information provided in the duly completed application are complete, true and correct in every detail.

Signed :

Name :

For and on behalf of (name of Applicant or partner of a joint venture):



Standard EOI Document

2. Applicant's Information Form

(In case of joint venture of two or more firms to be filled separately for each constituent member)

1. Name of Firm/Company:
2. Type of Constitution (*Partnership/ Pvt. Ltd/Public Ltd/ Public Sector/ NGO*)
3. Date of Registration / Commencement of Business (*Please specify*):
4. Country of Registration:
5. Registered Office/Place of Business:
6. Telephone No; Fax No; E-Mail Address
7. Name of Authorized Contact Person / Designation/ Address/Telephone:
8. Name of Authorized Local Agent /Address/Telephone:
9. Consultant's Organization:
10. Total number of staff:
11. Number of regular professional staff:

(Provide Company Profile with description of the background and organization of the Consultant and, if applicable, for each joint venture partner for this assignment.)



Standard EOI Document

3. Experience

3(A). General Work Experience

(Details of assignments undertaken. Each consultant or member of a JV must fill in this form.)

S. N.	Name of assignment	Location	Value of Contract	Year Completed	Client	Description of work carried out
1.						
2.						
3.						
4.						
5.						
6.						
7.						



Standard EOI Document

3(B). Specific Experience

Details of similar assignments undertaken in the previous seven years
(In case of joint venture of two or more firms to be filled separately for each constituent member)

Assignment name:	Approx. value of the contract (in current NRs; US\$ or Euro) ² :
Country: Location within country:	Duration of assignment (months):
Name of Client:	Total No. of person-months of the assignment:
Address:	Approx. value of the services provided by your firm under the contract (in current NRs; US\$ or Euro):
Start date (month/year): Completion date (month/year):	No. of professional person-months provided by the joint venture partners or the Sub-Consultants:
Name of joint venture partner or sub-Consultants, if any:	Narrative description of Project:
Description of actual services provided in the assignment: Note: Provide highlight on similar services provided by the consultant as required by the EOI assignment.	

Firm's Name: _____

² Consultant should state value in the currency as mentioned in the contract



Standard EOI Document

3(C). Geographic Experience

Experience of working in similar geographic region or country

(In case of joint venture of two or more firms to be filled separately for each constituent member)

No	Name of the Project	Location (Country/ Region)	Execution Year and Duration
1.			
2.			
3.			
4.			
5.			
6.			
7.			



4. Capacity

4(A). Financial Capacity

(In case of joint venture of two or more firms to be filled separately for each constituent member)

Annual Turnover	
Year	Amount Currency

- Average Annual Turnover

(Note: Supporting documents for Average Turnover should be submitted for the above.)



Standard EOI Document

4(B). Infrastructure/equipment related to the proposed assignment³

No	Infrastructure/equipment Required	Requirements Description
1.		
2.		
3.		
4.		
5.		

³ Delete this table if infrastructure/equipment for the proposed assignment is not required.



Standard EOI Document

5. Key Experts *(Include details of Key Experts only)*

(In case of joint venture of two or more firms to be filled separately for each constituent member)

SN	Name	Position	Highest Qualification	Work Experience (in year)	Specific Work Experience (in year)	Nationality
1						
2						
3						
4						
5						

(Please insert more rows as necessary)



Standard EOI Document

Annex B:

PRIORITY FORM (MANDATORY)

Name of Consulting Firm / JV:

Address:

Priority Number	Package Number.	Remarks
1		Please fill package no. as “1”, “2”, “4” in respective priority order
2		
3		
4		
5		
6		
7		
8		
9		

Note:- In case where priority form is not submitted, a default priority shall be filled in ascending Order of contract number E.g- 1,2,3,.....9



Government of Nepal
Ministry of Infrastructure Development
Department of Local Infrastructure Development (DoLID)
Road & Bridge Section
Pulchowk, Lalitpur

Terms of Reference (ToR) For



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TERMS OF REFERENCE (ToR)

TERMS OF REFERENCE (ToR) FOR FEASIBILITY STUDY, DETAILED ENGINEERING SURVEY, SOIL INVESTIGATION, HYDROLOGICAL STUDY, AND DETAILED DESIGN OF BRIDGES

INTRODUCTION AND BACKGROUND

Nepal's complex topography, characterized by over 6,000 rivers and streams traversing mountainous terrain, demands a robust bridge network to ensure connectivity, socio-economic integration, and national development. Motorable bridges serve as critical infrastructure, enabling the movement of goods, people, and services between remote and urban areas. These structures are vital arteries, connecting remote communities, facilitating social interaction, fostering cultural exchange, and driving economic development across the nation. The Government of Nepal, through its various agencies such as the Department of Roads (DoR), Department of Local Infrastructure Development (DoLID), provincial governments, and local levels, is committed to the systematic development of safe, reliable, and cost-effective bridges across the country for all weather road transport Network.

Bridges are of immense importance in Nepal due to its difficult mountainous terrain and numerous rivers that often isolate communities. They serve as lifelines by connecting remote settlements with markets, schools, hospitals, and administrative centers, thereby reducing travel time and cost. Bridges also promote economic growth by facilitating trade, tourism, and the transport of agricultural products, while enhancing social inclusion and poverty reduction in rural areas. Moreover, they are vital for national highways, cross-border connectivity with India and China, and ensuring access during disasters and emergencies. Thus, bridges play a crucial role in Nepal's socio-economic development, regional integration, and overall national resilience.

Government of Nepal, Ministry of Infrastructure Development, Department of Local Infrastructure Development (DoLID), Road & Bridge Section (RBS), Pulchowk, Lalitpur (herein after referred as the "Client" or as the "DoLID/RBS"), is committed to the systematic development of safe, reliable, and cost-effective bridges that adhere to national standards and international best practices. This ToR outlines the comprehensive consultancy services required for the planning, investigation, and design of such bridges as well as intends to utilize services of engineering consulting firms, well experienced in the fields of soil investigation, hydrological studies, bridge engineering, river training works, environment aspects etc.(herein after referred to as the "Consultant") for providing engineering consulting services for detail design work of proposed Bridge(s) including river training works, and approach roads (herein after referred to as the "Service").

This ToR outlines the comprehensive requirements for consulting services encompassing all critical stages of bridge project development, from initial feasibility to detailed design, ensuring adherence to national standards and best engineering practices.



OBJECTIVES OF THE CONSULTANCY SERVICES

The primary objective of these consulting services is to provide comprehensive engineering expertise for the planning, investigation, and detailed design of proposed bridge projects in Nepal. This includes, but not limited to the followings

1. To assess the technical, environmental, social, and economic feasibility of the proposed bridge site(s).
2. To identify the optimal bridge location and configuration based on multi-criteria evaluation.
3. To conduct detailed engineering surveys to accurately map site conditions and gather precise data essential for subsequent detailed design, and preparation of the Detailed Project Report (DPR).
4. To perform thorough soil investigations to determine the engineering properties of sub-soil, ensuring stable and seismically resilient foundation design and acquire bridge design parameters and predict construction difficulties;
5. To undertake detailed hydrological and hydraulic studies to address monsoon-driven flooding, river dynamics, and scour potential for accurate design of bridge waterways and river training works.
6. To carry out the detailed engineering design and prepare engineering drawings of proposed bridge works and prepare detailed cost estimate(s).
7. To prepare a safe, reliable, and cost-effective detailed design of the bridge(s), including river training works and approach roads, considering local conditions and national/international standards.

SCOPE OF WORKS

After contract agreement and prior to commencement of job, a Kick-Off meeting will be organized in “DoLID/RBS” (on the date requested by consultant keeping in view the overall project completion date is not delayed) in the presence of the whole key working team (Key Staffs) of the consultant. The consultant shall have to start the job only after issuance of written approval from the client to commence the job. The consultant shall arrange field visit accompanying the whole working team required for execution of the job. The consultant shall have to perform the job in close coordination with DOLID(RBS) and/or respective LIDPOs. It is the liability of the consultant to retain the team at site (as per Manning Schedule provided by consultant during contract agreement) during the entire field study and survey work. The consultant shall have to perform the geotechnical investigation work under direct supervision of representative of DOLID(RBS)/LIDPOs. During field supervision by the client at any time, if any required key professionals are found absent at site, client may instruct to stop the work until the required key professionals are present at the site to carry the job. In case, the consultant performing the field study and survey work with incomplete set of professionals working team, “Client” may not be liable for payment to the consultant. The Consulting Firm/Team shall perform the following services for each assigned bridge project, tailored to Nepal’s unique topographic, seismic, and hydrological conditions. The



scope of work, shall be to accomplish the assigned work in the close coordination and supervision of “DOLID(RBS)/ LIDPOs”, to be carried out by the consultant shall include but may not be limited to the following.

IDENTIFICATION AND FEASIBILITY PHASE

Desk Study:

The “Consultant” (team of Bridge Engineer, Geologist and Hydrologist or Bridge Design Team) shall carryout a desk study collecting all data, maps and information and reviewing for planning of further field survey and investigation works as well as detailed design. In this study the following points related to the probable location of the river crossing shall be studied in detail.

- I. Review maps, satellite imagery, topographical data, and previous studies.
- II. Nature and structure of the surface soil
- III. Nature and structure of local as well as regional geology
- IV. River Morphology.

Based on the collected information a desk study report shall be prepared which shall contain base map of the study area, site location, approach roads, existing bridges (if any), nearest bridge, previous study reports etc., if available and shall provide enough data for the field visit. A desk study should be carried out by collecting all data such as location of the bridge site(s), Based on the collected information a desk study report/ Inception Report shall be prepared which shall contain base map of the study area, site location, approach roads, existing bridges (if any), nearest bridge, previous study reports etc., and shall provide enough data for the field visit.

Site Visits

Site Visits: Conduct reconnaissance surveys to identify and evaluate at least three alternative bridge locations.

Feasibility Study

The feasibility study shall systematically review existing data, collect and analyze new field data, and conduct comprehensive analyses to ascertain the technical, social, environmental, and economic viability of proposed bridge site(s).

Technical Feasibility Study:

The consultant shall evaluate the Technical Feasibility of the bridge site based on data collected on following aspects:

- Geological / Geo-technical condition of the site
- Topographical condition of the site
- Tentative bridge length, probable bridge type with span arrangement, constructability of the proposed bridge;
- Availability of access road, construction material, possibility of transportation of equipment / materials at site;
- Environmental impacts/screening;



- Social impacts/screening and social acceptability of the bridge
- Cost effectiveness from both perspective of construction as well as maintenance cost

Some points are listed below;

a. Data Review and Analysis: Review all available secondary data, collect new field data, and conduct engineering analysis to determine the technical feasibility of bridge site(s).

b. Bridge Site Selection: Select the most suitable site based on site and catchment characteristics. The selected site must be clearly indicated on a topographic map with all characteristic features for easy reference during design.

At least 3 (three) alternative bridge sites shall be studied and recommended for the best site based on geology/geo-morphology of the river and river banks, crossing location with respect to the existing road alignment, bridge length, environmental and social consideration. The selection for the site of the bridge shall follow the guidelines given in IRC: 5-2015 (Clause 104.1) Formal approval of the bridge alignment shall be obtained from the DOLID (Road and Bridge Section) during the presentation of inception report.

c. Preparation of Index Plan:

The index plan shall locate the project area in the map of Nepal, respective district map and nearby major towns. It should give bird's eye view of the project area.

d. Preparation of Site Plan and Preliminary Topographical Mapping: Site plan shall be drawn to scale showing the details of the site extending not less than 100 meters on upstream and downstream from the center of crossing. It should cover approaches to sufficient distances. In case the river is meandering near the site of bridge, the site plan should cover at least two loops on either side. The site plan should also contain direction of flow of water, existing approach, angle of skew if any, location and value of permanent bench mark, location of cross sections and longitudinal sections taken and location of trial pit of boring.

Prepare preliminary topographical maps with contours at 1-meter intervals in hilly areas and 0.25-meter intervals in plain areas. Flood lines on both sides of the river in the entire surveyed area, traverse lines, benchmarks, and skew angle (if any) must be indicated. Names of nearest identifiable villages/towns are also required.

e. Preparation of Cross-sections and Longitudinal Sections of river bed

Cross sections should be taken covering minimum 200 m beyond flood lines of the river at proposed bridge site, up to minimum 500 m U/S and minimum 200 m D/S wherein HFL, LWL, LBL, area of cross section, wetted perimeter and geological profile with silt factor for each strata (at proposed bridge site only) shall be indicated.

At least three cross-sections, including one at the bridge axis, shall be taken using leveling equipment at site showing ground features (not generated by interpolation of topographical survey data).

Similarly, the longitudinal cross section of the river should also extend upstream and downstream of the proposed site of bridge as shown above.



Preliminary Site Investigation

Preliminary investigation shall include the study of existing geological information, previous site reports, geological maps etc., and surface geological examination. These will help to narrow down the number of sites under consideration and also to locate the most desirable location for detailed sub-surface investigation.

Preparation of Engineering Geological Map

An engineering geological map of the site in the scale of 1:500 or 1:1000 shall be prepared. The area that has to be covered depends on condition of the site that may have direct effect upon the stability of the proposed bridge site. Existing topographical map may be used as the base map. This map shall have information on geological/geomorphological/structural geological information of the site. Published maps can be used to compile this information. Besides this information, this map shall contain following information:

- Scars cracks, upheavals, and hollow collapses.
- Water spring points, swampy area, seepage area etc.
- Existing landslides or other instability features that may has impact on stability of the proposed bridge;
- Soil/rock types at the surface;
- Geological structures such as faults/shear zone/folds etc.
- Tilted trees or post outcrops.
- Artificial slope cutting, irrigation channel, existing bridges, roads other civil engineering structures.

Survey Methodologies and Data Collection Requirements:

The detailed engineering survey shall provide precise, current, and comprehensive data essential for the subsequent detailed design and preparation of the Detailed Project Report (DPR) for proposed roads and bridges.

a. Site Plan: Prepare a detailed site plan (scale 1:500 or 1:1000) extending at least 100 meters upstream and downstream from the center of the proposed bridge crossing and covering sufficient distances for approach roads. It should clearly indicate the direction of water flow, existing approaches, the angle of skew (if any), the location and value of permanent benchmarks, and the precise location of all cross-sections and longitudinal sections taken.

b. Topographic Map Coverage: The survey area should extend a minimum of 500 meters upstream, 200 meters downstream, and 200 meters from the riverbanks on either side of the proposed bridge site.

c. Contour Intervals: Specify contours at 1-meter intervals in hilly areas and a more precise 0.25-meter intervals in plain areas, with a required density of at least one survey point per 10 square meters.

d. Cross-sections: At least three cross-sections are required, including one precisely at the bridge axis. These sections must extend 200 meters beyond the flood lines of the river at the proposed bridge site, covering up to 500 meters upstream and 200 meters downstream. They must



clearly indicate High Flood Level (HFL), Low Water Level (LWL), Low Bed Level (LBL), the area of the cross-section, wetted perimeter, and the geological profile with silt factor for each strata (at the proposed bridge site only). Crucially, these cross-sections must be taken using leveling equipment directly at the site, not generated by interpolation from topographical survey data.

- Government. and/or public establishments such as infrastructures, houses, recreational parks or other facilities like irrigation canals, water supply pipelines and sewerage lines, electricity and telecommunication lines, etc.
- The angle and direction of skew, if the bridge is proposed to be aligned skew.
- The names of the nearest identifiable villages/towns etc. in either ends of the bridge.
- Information relevant with ongoing/future development projects along the river and around the appropriate vicinity of the bridge-site that will affect the existence, stability, and functionality of the proposed bridge

e. Bridge Axis Profile: A detailed profile is necessary along the selected bridge axis, covering 25 meters behind the main anchorage block up to the edge of the river flow. Survey points should be strategically fixed at breaking points of slope and terraces to accurately capture the topography along the bridge axis.

f. Plan View: A plan view showing the bridge axis, benchmarks, and fixed objects (such as trees and houses) is also required, with distances and directions from reference points to ensure precise location during construction. This plan view is particularly important if a wind guy arrangement is considered in the bridge design.

g. Traverse Survey: Mandated using Total Station/Theodolite, with angles measured by the double reversed method. Accurate methods must be employed for distance measurement between consecutive transit stations. Benchmarks are to be fixed at every 250-meter interval or at 500-meter intervals in special cases, with a single datum (preferably geodetic survey datum) used to tie up all levels.

h. Grid Survey: A grid survey at 1-meter or 2-meter intervals may be necessary at locations with sharp curves, difficult terrain, and at all bridge sites.

i. Control of Lines and Levels: Accurate control of lines and levels must be maintained at all stages of construction, with control points established at least every 10-meter for roads, or closer if directed by the Engineer. The existing profile and cross-sections are to be taken jointly by the Engineer and the Contractor, forming the fundamental basis for measurements and payments during construction.

j. Data Integration and Consistency: Explicitly require a dedicated phase for data integration and consistency verification across all survey disciplines (topographical, hydrological, geotechnical). This involves cross-referencing and reconciling data to ensure a cohesive and reliable dataset for design. Clear protocols for identifying and resolving data conflicts must be outlined.

k. Dynamic Monitoring/Re-verification: For projects with extended timelines or in dynamic river systems, mandate periodic re-verification surveys (e.g., after major flood events, or



if construction is delayed beyond a specified period) to ensure designs remain based on current ground and hydraulic conditions.

1. Advanced Technologies: Encourage and, where appropriate, mandate the use of advanced surveying and data processing technologies such as LiDAR, drone-based photogrammetry, and advanced Geographic Information Systems (GIS) for data acquisition, processing, and management.

Seismological Study:

The consultants shall collect and refer to the available data regarding the seismic records of the area. Seismic Forces: according to the Indian Standard Criteria for Earthquake Resistant Design of Structures, IRC: 6 and IRC SP 114 may be followed.

Economic Feasibility Study:

Conduct a comparative analysis of costs for different bridge types (e.g., Reinforced Cement Concrete (RCC), Prestressed Concrete (PSC), Steel Truss) and discuss thoroughly with the Project In-charge before proceeding to soil investigation. An economic feasibility study for a motorable bridge is a critical analysis conducted to determine if the project is a sound investment from a societal and economic perspective. Unlike a financial feasibility study that focuses on revenue and profit, an economic study evaluates the project's overall benefits to the community and the national economy, regardless of who pays for it or who receives the benefits.

The primary goal is to assess whether the bridge project's total benefits outweigh its total costs over its lifecycle. It provides decision-makers with a robust, evidence-based argument for or against the investment, helping to prioritize projects and allocate public funds effectively.

2. Key Components and Methodology

The core of the study is a Cost-Benefit Analysis (CBA), which systematically quantifies and compares all project-related costs and benefits.

a. Identification of Costs

Costs are categorized into two main groups:

Initial Capital Costs: These are one-time expenses for the project's development.

Direct Construction Costs: All expenses related to the physical construction of the bridge, including materials, labor, equipment, and contractor fees.

Pre-construction Costs: Expenses for design, engineering, feasibility studies, environmental impact assessments (EIA), and land acquisition.

Contingency: A provision for unforeseen costs and risks during construction.

Operating and Maintenance (O&M) Costs: These are recurring expenses over the bridge's lifespan.

Routine maintenance, inspections, repairs, and resurfacing.

Administrative costs and toll collection expenses (if applicable).

b. Identification and Quantification of Benefits

Benefits are the positive economic impacts resulting from the bridge. They are often more challenging to quantify than costs but are essential for a complete analysis.

Direct Benefits (User Benefits):



Travel Time Savings: Reduced travel time for commuters, commercial vehicles, and public transport due to a direct crossing. This is monetized by assigning a value to time saved for both passengers and goods.

Vehicle Operating Cost Savings: Reductions in fuel consumption, vehicle maintenance, and tire wear from shorter distances and less congested routes.

Accident Cost Reduction: Improved road safety, leading to fewer accidents, injuries, and fatalities. The value is calculated based on the cost of accidents avoided.

Improved Reliability: Predictable travel times reduce costs for businesses reliant on "just-in-time" logistics.

Indirect Benefits (Wider Economic Benefits):

Regional Economic Development: New business and employment opportunities, increased property values, and improved access to markets for local producers.

Social and Community Benefits: Better access to essential services like hospitals, schools, and markets for local communities.

Environmental Benefits: Potential reduction in carbon emissions and air pollution from shorter travel distances and less traffic congestion.

c. Economic Evaluation Metrics

Once costs and benefits are identified and monetized, they are discounted to their present value to account for the time value of money. The most common metrics used are:

Net Present Value (NPV): This is the sum of the present values of all future benefits minus the present values of all future costs. A positive NPV indicates that the project is economically viable.

Benefit-Cost Ratio (BCR): This is the ratio of the total discounted benefits to the total discounted costs. A BCR greater than 1.0 signifies that the benefits exceed the costs, making the project economically worthwhile.

Internal Rate of Return (IRR): This is the discount rate at which the NPV of the project becomes zero. A project is considered economically viable if its IRR is higher than the societal discount rate (the opportunity cost of capital).

3. Sensitivity and Risk Analysis

A crucial part of the study involves testing the robustness of the results. This includes:

Sensitivity Analysis: Varying key assumptions (e.g., traffic projections, construction costs, discount rate) to see how they impact the NPV and BCR.

Risk Analysis: Identifying potential risks (e.g., cost overruns, delays, lower-than-expected traffic) and assessing their probability and potential impact on the project's economic viability.

4. Final Recommendations

The study culminates in a detailed report that outlines the analysis, findings, and recommendations. It should clearly state whether the project is economically justified and provide a transparent basis for the conclusion. To make decisions that maximize public value.

Hydrological Feasibility Study:

a. Collection of Hydrological Data- In general, collection of hydrological data shall include collection of history of flood discharge, maximum HFL, maximum velocity of flood flow, river



flow characteristics, rainfall intensity and catchments area and characteristics of catchments area. The general guidelines provided in IRC:5-2015 and Guidelines on Hydrologic and Hydraulic Analysis and River Training Works for Bridges Design shall be followed in the collection of the hydrological data.

In detail the consultant shall carry out a detailed hydrometrical survey and hydrological study of the river and bridge site, which shall include the following:

- Catchment area of the river up to bridge site
- Length of the river from origin up to bridge site
- Possibility of change of catchment
- Nature, size and quantities of debris carried by the river
- Intensity, duration and distribution of rain in the catchment
- Vegetation, cultivation etc. of the catchment.
- Existence of reservoir's, lakes etc. in the catchment.
- Existing bridge or other hydraulic structures across the river in the vicinity of the proposed bridge site with their details as much as possible.
- General slope of the river from the critical point (origin) of the river up to bridge site and general slope of the catchment in both sides of the river.
- Maximum discharge calculated by established formulas with different return periods and the peak discharge observed over a period of 100 years, linear water way shall be calculated based on the methods and the formula given in IRC:5-2015, Guidelines on Hydrologic and Hydraulic Analysis and River Training Works for Bridges Design and other relevant codes.
- Velocity and depth of flow at the time of survey.
- Shifting of the river in the past at proposed bridge site and in its vicinity.
- Effect of climate change
- Other information required for river control, design, construction and maintenance of the bridge.

Environmental Feasibility Study:

The consultant shall predict/assess the damages to the environment and attempt to mitigate or minimize the damages by choosing appropriate mitigation site, cross-section, type of structures etc. and suggest appropriate measures in the design for protection of surrounding Environment. To identify, predict, and evaluate the potential environmental impacts of the proposed bridge project and its alternatives, determine the project's environmental viability, and recommend feasible mitigation measures and environmental management provisions in compliance with the Environmental Protection Act, 2076 Environmental Protection Rule, 2077 and the DOLID environmental policies including Environmental and Social Management Framework (ESMF), modified by DOLID/DoR for bridges should be followed.

1. Baseline Environmental Assessment

Physical Environment:

- Topography, geology, soil stability, seismic risk.



- Climate and meteorology.
- Air quality, noise levels, water quality.
- River hydrology and sedimentation patterns.

Biological Environment:

- Aquatic ecosystems and fish habitats.
- Terrestrial flora and fauna.
- Forests and vegetation cover, protected/endangered species.
- Proximity to protected areas or sensitive habitats.

Socio-environmental Setting:

Land use, settlement patterns.

Cultural, archaeological, and religious sites.

Public health and safety conditions.

2. Impact Identification & Prediction

Construction Phase:

- Soil erosion, spoil disposal, dust, noise, vibration.
- Water pollution from construction runoff.
- Disturbance to aquatic life during in-river works.
- Temporary disruption to community access.
- Tree/vegetation clearance.

Operation Phase:

- Risk of riverbank erosion and scouring.
- Changes in aquatic habitat.
- Traffic noise and air emissions.
- Increased access and possible land-use change.
- Cumulative & Induced Impacts:
- Upstream/downstream hydrological changes.
- Induced settlement or deforestation.

3. Alternative Analysis

- No Project Scenario — environmental condition without bridge.
- With Project Alternatives — comparing locations, span arrangements, and foundation methods for least environmental harm.
- Construction Method Alternatives — e.g., in-water vs. cantilever erection.

4. Environmental Mitigation Measures

- Site-specific erosion control and slope stabilization.
- Sediment and pollution control during works.
- Timing restrictions for in-river works to protect fish spawning.
- Noise and dust suppression.
- Waste management plan.
- Compensatory plantation and habitat restoration.



- Safety measures for workers and public.

5. Environmental Management Plan (EMP)

- Roles and responsibilities.
- Environmental monitoring schedule (air, water, noise, biodiversity).
- Capacity building and training.
- Estimated cost for mitigation and monitoring.

6. Climate & Disaster Risk Considerations

Climate change projections for river flow and flooding.

Bridge resilience measures (higher design flood return period, scour protection).

Disaster preparedness plan.

7. Stakeholder Consultation

Engagement with local communities, affected persons, and relevant agencies.

Documentation of concerns and incorporation into design and EMP.

Social Feasibility Study:

Conduct a Social Feasibility Survey to justify the bridge construction, ensuring it genuinely addresses community needs and provides tangible benefits. Assess socio-economic indicators for ranking and prioritization, including the level of local participation, the geographical size of the area of influence (Zone of Influence - ZoI), the volume of current and projected traffic flow, and the overall socio-economic benefits anticipated from the proposed bridge. Develop explicit, measurable, and verifiable metrics for these factors to ensure objective prioritization. Perform traffic counts and origin/destination surveys to accurately determine the nature and current volume of goods, animal, and pedestrian movements (both motorized and non-motorized traffic) within the bridge's influence area. This data is vital for determining the appropriate bridge capacity and design loadings.

1 Baseline Social Profile

- **Demographics:** Population, household size, gender ratio, vulnerable groups (Dalit, Janajati, poor households).
- **Livelihoods:** Main occupations, income sources, seasonal migration patterns.
- **Social Services & Infrastructure:** Education, health, markets, mobility.
- **Land Use & Tenure:** Agricultural, residential, communal land, forest areas.
- **Cultural & Heritage Sites:** Temples, shrines, cemeteries, archaeological resources.

2 Stakeholder Mapping

- Identify primary (directly affected) and secondary stakeholders (indirectly affected, local authorities, NGOs, women's groups, transport operators).
- Analyze stakeholder interests, influence, and expectations.

3 Impact Identification

**Positive Impacts:**

- Improved access to markets, schools, and health services.
- Reduced travel time and transport cost.
- Better emergency response connectivity.
- Economic stimulation and trade facilitation.

Potential Negative Impacts:

- Land acquisition and resettlement needs.
- Loss of livelihood (shops, farmland).
- Physical or economic displacement.
- Impacts on vulnerable groups.
- Temporary disruption to community mobility during construction.
- Safety risks from construction activities.

4 Resettlement & Livelihood Restoration

- Conduct census and asset inventory of affected persons.
- Prepare a **Resettlement Action Plan (RAP)** or **Abbreviated RAP** as per impact scale.
- Propose livelihood restoration measures for displaced households.

5 Gender Equality and Social Inclusion (GESI) Analysis

- Participation of women and marginalized groups in consultations.
- Identify barriers to access and use of the bridge.
- Recommend design features for inclusivity (pedestrian paths, safety rails, lighting).

6 Community Health & Safety

- Assess risks of increased traffic, accidents, communicable diseases.
- Propose safety campaigns, signage, and local awareness programs.

7 Grievance Redress Mechanism (GRM)

- Develop accessible, transparent, and culturally appropriate GRM for affected persons.

Discussion with Project In-charge:

Engage in detailed discussions with the Project In-charge for the final decision on the bridge site, covering collected hydrological data, design discharge, scour depth (maximum and design), linear waterway requirements, anticipated soil conditions for foundations, the most feasible



proposed bridge site, necessary river training works, approach roads, and the proposed type of foundation, substructure, and superstructure.

Determination of the Bridge Length / span arrangement of bridge

The length and span arrangement of the bridge shall be proposed based on:

- The linear waterway;
- The type of river bed and banks
- Geo-technical stability;
- Constructability;
- Cost effectiveness.

Concept Design Report:

Based on the desk and field data collected under feasibility stage a concept design for the most feasible site shall be prepared. This concept design shall have a General Arrangement Drawing with profile. This drawing shall be supplemented by location map, existing road network, nearby settlement area (if any), engineering geological map of the site, hydrological information, construction methodology, specification, environmental impact scenario, social impact and social acceptability scenario, economical aspect etc.

This concept design shall be presented to Road and Bridge Section /DoLID and shall be finalized after incorporating the suggestions and comments from Road and Bridge Section /DoLID. The bore hole locations, their numbers, tentative depth and any other geo-technical investigation requirements shall also be finalized after presentation of this concept design and discussion with Road and Bridge Section /DoLID.

INVESTIGATION PHASE

Soil Investigation

Discussion and finalizing of the site/axis and span arrangement on the conceptual Design report presentation the Consultant shall carry out subsurface exploration, which shall include the followings.

Detailed Soil Exploration:

Based on data obtained from preliminary investigations and conceptual design with bridge type and foundation arrangement with probable type of foundations, the programme of detailed investigations shall be tentatively decided; relevant codes and specifications shall be referred in the process.

Thereafter the scope of detailed investigation including the extent of exploration, number of bore holes, type of tests, number of tests etc., shall be decided in close liaison with the design engineer and the exploration team, so that adequate data considered necessary for detailed design and execution are obtained.

Determination of borehole locations

As per finalizing the bridge span arrangement during the conceptual design report presentation with the client borehole location for sub-soil sample shall be decided. One boring at each proposed



location of each foundation shall be done and the engineering properties of the sub-soil at the location shall be worked out in detailed.

Determination of borehole Depths:

The exploration shall cover the entire length of the bridge and a distance of zone of influence also at either end. Generally, the sub-surface investigations should extend to a depth below the anticipated foundation level. The depth of exploration in general shall be as follows:

SN	Type of soil	Depth of Soil Exploration
1	Silty, sandy, clayey soil	3 times the design scour depth, or 1.5 times the least dimension of the foundation footing not exceeding 25 m
2	Granular soil (gravels, boulders)	2 times the design scour depth, or 1.5 times the least dimension of the foundation footing, not exceeding 20 m
3	Rocks (soft or hard)	Not exceeding 8 m on continuous bed rock

Soil exploration works to be certified

The consultant, may be asked to submit the soil/rock samples obtained from the drilling works in core boxes. The consultant shall record video clips clearly visible of total drilling depth and locations of all drilling works. The video shall be taken so that the surrounding area is also appropriately captured such that it will be a reliable tool for recognizing the bridge-site. The consultant shall perform the geotechnical investigation under supervision of DoLID/RBS/LIDPO. The bore/drill logs should be certified by the geotechnical engineer of the consultant.

Determination of Engineering Properties of Soil:

The sub-soil investigation shall broadly consist of two stages, preliminary investigation and Detailed investigation. In general, the investigation procedure and collection of data shall follow the guidelines provided in Codal provision. As a general guide it shall be comprehensive enough to enable the designer to estimate or determine the following: -

- Engineering properties of the soil / rock
- Location and extent of weak layers and cavities, if any, below hard founding strata
- The sub-surface geological condition, such as, type of rock, structure of rock i.e. folds faults, fissures, shears, fractures, joints, dykes and subsidence due to mining or presence of cavities
- Profile of sub-surface geological features along the bridge axis, and in transverse direction to the bridge axis at the foundation locations as agreed with employer upon discussion during inception phase
- Ground water level
- Artesian conditions, if any;
- Quality of water in contact with the foundation
- Depth and extent of scour
- Suitable foundation level
- Safe bearing capacity of foundation stratum



- Probable settlement and probable differential settlement of the foundations
- Likely sinking or driving effort; and
- Likely construction difficulties

Method of Soil Sampling

The size of the bores shall be predetermined so that undisturbed samples as required for the various types of tests are obtained. The method of taking soil samples shall be as given in IS:1892 and IS:2132. The tests on soil samples shall be conducted as per relevant part of IS:2720.

Foundations Requiring Shallow depth exploration (Open Foundation)

These shall cover cases where the depth of exploration is not deep and it is possible to take samples from shallow pits or conduct direct tests like plate load tests etc. This will also cover generally the foundation soil for approach embankments, protective works etc.

Tests shall be conducted on undisturbed representative samples, which may be obtained from open pits. The use of plate load test (IS:1888-Method of Load Test on soils) is considered desirable for ascertaining the safe bearing pressure and settlement characteristics. A few exploratory bore holes or soundings shall be made to safeguard against presence of weak strata underlying the foundation. This shall extend to a depth of about 1½ times the proposed width of foundation.

The tests to be conducted at various locations for properties of soil are different for cohesive and cohesionless soils. These are indicated below and shall be carried out wherever required according to soil type.

Cohesionless Soils.

(a) Laboratory Tests.

- (i) Classification test, index tests, density determination etc.
- (ii) Shear strengths by triaxial / direct shear etc.

(b) Field Tests.

- (i) Standard penetration Tests (as per IS:213)

Cohesive Soils.

(a) Laboratory Tests.

- (i) Classification test, index tests, density determination etc.
- (ii) Shear strengths by triaxial / direct shear etc.
- (iii) Unconfined compression test (IS:2720 Part X)
- (iv) Consolidation test (IS:2720 Part V)

(b) Field Tests.

- (i) Vane Shear Test (IS:4434)
- (ii) Static Cone Penetration Test (IS:4968 Part III)

Note: Where dewatering is expected, the samples may be tested for permeability (IS: 2720 Part- XVII).



Foundation Requiring Large Depth of Exploration.

In this group, cases of deep foundation i.e. well, pile foundations are covered. Where the use of boring equipment, special techniques of sampling, in-situ testing etc., become essential. In addition to the problems of soil and foundation interaction an important consideration can be the soil data required from constructions. Often in the case of cohesionless soils, undisturbed samples cannot be taken and recourse has to be made to in-situ field tests.

The sub-surface exploration can be divided into three zones: -

- Between bed level and up to anticipated maximum scour depth (below H.F.L.)
- From the maximum scour depth to the foundation level and
- From foundation level to about 1½ times the width of foundation below it.

Sampling and testing (in-situ and laboratory) requirement will vary in each case and hence are required to be assessed and decided from case to case. The sub-soil water shall be tested for chemical properties to evaluate the hazard of deterioration to foundations. Where dewatering is expected to be required, permeability characteristics should be determined.

For the different zones categorized as above, the data required, method of sampling, testing etc., are given in Table-1. Samples of soils in all cases shall be collected at every 1 to 1½ meter or at change of strata.

Table-1.

Zones	Data Required	Sampling and Testing	Remarks including limitations
Bed level to Anticipated maximum scour depth	(i) Soil classification (ii) Particles size distribution	Sampling for (i) and (ii) disturbed samples may be collected. For (iii) and (iv) undisturbed samples shall be collected. Cohesionless soils – Dynamic Penetration Tests. Cohesive Soils – (i) Static penetration Test-cone and skin resistance to be obtained. (ii) Field vane shear may be done. Laboratory Test (i) Classification Tests including particle size distribution.	(i) Laboratory tests to be conducted according to the relevant parts of IS:2720. (ii)Undisturbed sampling cohesionless solids are a difficult and expensive process. In general, in such cases, in-situ tests may be adopted. (iii) Boring and sampling tends to cause remoulding of sensitived clays. Disturbance and stress changes for fissured or layered clays may also make the sample not truly



		(ii) Shearing strength Triaxial tests to be done on undisturbed samples. Unconfined compression tests to be done on undisturbed and remoulded samples.	representative of the in-situ condition. In such cases use of in-situ tests may give results more representative of the actual soil Characteristics.
Maximum Anticipated scour level To the foundation level	(i) Soil classification (ii) Shearing strength characteristics (iii) Compressibility (iv) Permeability where dewatering is Expected. (v) Moisture content, density, void ratio	Same as above	Same as above
Foundation level to about 1½ times of the Width of Foundation below it.	i) Soil classification (ii) Shearing strength (iii) Compressibility	Same as above and consolidation test to be done on undisturbed Samples.	Same as above

Required Field and Laboratory Tests:

a. Field Tests: This includes the excavation of 1m x 1m test pits for soil sampling up to a depth of 3 meters.

b. Laboratory Tests: These tests are generally required at a frequency of at least two per borehole, unless otherwise specified: Grain size analysis (Sieve analysis), Hydrometer analysis, Moisture content, Bulk and dry density, Unconfined compression test, Consolidation test, Direct shear test, and Atterberg limit tests (when applicable).

c. Additional Tests: If field conditions warrant, the consultant shall conduct other types of tests, and the frequency of the listed tests can be increased. The cost of all field and laboratory tests must be incorporated into the overall soil investigation works. For highly variable and complex geological conditions, more intensive and flexible testing regimes are required beyond minimum frequencies.¹

d. Professional Responsibility: These specified depths are indicative only. The consultant retains the professional responsibility to determine the actual required depth of soil investigation based on specific field conditions and the evolving design parameters.

e. Geotechnical Risk Assessment: Mandate a detailed geotechnical risk assessment framework and a clear process for handling inherent uncertainties in soil parameters (e.g.,



variability, liquefaction potential in seismic zones), ensuring designs adequately account for potential geotechnical risks.

Determination of bearing capacity-

Based on the field test and laboratory test, the consultant shall suggest a tentative type of foundation to be adopted and calculate the bearing capacity of the soil at various founding level.

DESIGN PHASE

The objective is to design a safe, reliable, and cost-effective bridge using appropriate technology, considering local conditions, seismic risks, and hydrological challenges.

Design Parameters and Standards:

a. Design Life: All permanent bridges shall be designed for a minimum design life of 100 years, with traffic projections extending over a 30-year period.

b. Design Discharge: Design for a 100-year return period discharge. Empirical formulas developed for other catchments shall not be used.

c. Bridge Loadings: Design as per Indian Road Congress (IRC) or American Association of State Highway and Transportation Officials (AASHTO) loadings. All design shall be in accordance with IRC standards unless otherwise specified.

d. Geometric Standards:

i. Carriageway: Minimum **7.5m** for Highways/Urban Roads, **6.0m** for Feeder Roads. No permanent bridge shall have less than 6.0m carriageway except on minor roads (<25m length).

ii. Footpath: Provide footpaths in settlement areas or high pedestrian traffic areas, separated by safety curbs (rural) or raised footpaths/curbs (urban). Minimum clear width of 1.0m (excluding railings) where necessary.

iii. **Clearances:** As per relevant Codal Provision.

iv) Vertical Clearance: As per relevant Codal Provision.

g. Curbs and Railings: Raised curbs not less than 450mm wide and 200mm high. Safety bridge curb height not less than 500mm from carriageway.

h. Drainage: Design appropriate carriageway drainage.

i. Reinforced Soil Structures: Design and construction of reinforced soil retaining walls, abutments, or slopes, including any required ground improvement measures, as per Annexure 300-1 of Standard Specifications.

k. Seismic-Resistant Design: Incorporate seismic-resistant design features (e.g., ductile detailing, base isolation) as per **Nepal Building Code (NBC) 105:2020 and relevant IRC Codal Provision.**

Based on the collected information and results of the discussions mentioned above the consultants shall design the bridge as per the standard codes of practice, norms and guidelines. The design philosophy of limit-state method shall be adopted for the design of bridges. As far as possible, the consultants are advised to follow updated editions of relevant codes and special provisions of IRC, IS and Nepal Bridge standard 2067. However, other codes not mentioned in the list may also be followed if necessary. The list of all reference literature and materials shall be provided on the report.



List of some important standard code of practice

1) Publications of Department of Roads:

- Nepal Bridge Standard, 2067
- Nepal Road Standard, 2070

Other relevant publications of department of Roads, Nepal

2) Indian Road Congress publication

I. IRC SPECIFICATIONS, STANDARDS, DESIGN CODES		
1.	IRC:5-2015	Standard Specifications and Code of Practice for Road Bridges, Section I – General Features of Design (Eighth Revision)
2.	IRC:6-2017	Standard Specifications and Code of Practice for Road Bridges, Section-II Loads and Load Combinations (Seventh Revision)
3.	IRC:22-2015	Standard Specifications and Code of Practice for Road Bridges, Section VI – Composite Construction (Limit States Design) (Third Revision)
4.	IRC:24-2010	Standard Specifications and Code of Practice for Road Bridges, Steel Road Bridges (Limit State Method) Third Revision
5.	IRC:78-2014	Standard Specifications and Code of Practice for Road Bridges, Section VII- Foundations and Substructures (Revised Edition)
6.	IRC:83-20015 (Part-I)	Standard Specifications and Code of Practice for Road Bridges, Section IX Bearings, Part I: Roller & Rocker Bearings (Second Revision)
7.	IRC:83-2018 (Part II)	Standard Specifications and Code of Practice for Road Bridges, Section IX – Bearings (Elastomeric Bearings), Part II (Second Revision)
8.	IRC:83-2018 (Part III)	Standard Specifications and Code of Practice for Road Bridges, Section IX – Bearings, Part III: POT, PIN, Metallic Guide and Plane Sliding Bearings (First Revision)
9.	IRC:83-2014 (Part IV)	Standard Specifications and Code of Practice for Road Bridges, Section IX – Bearings (Spherical and Cylindrical)
10.	IRC:89-1997	Guidelines for Design and Construction of River Training & Control Works for Road Bridges (First Revision)
11.	IRC:112-2011	Code of Practice for Concrete Road Bridges
II. IRC SPECIAL PUBLICATIONS		
1.	IRC: SP:64-2016	Guidelines for the Analysis and Design of Cast-in-Place Voided Slab Superstructure (First Revision)
2.	IRC: SP:65-2018	Guidelines for Design and Construction of Segmental Bridges (First Revision)



3.	IRC: SP:66-2016	Guidelines for Design of Continuous Bridges (First Revision)
4.	IRC: SP:67-2005	Guidelines for Use of External and Unbonded Prestressing Tendons in Bridge Structures
5.	IRC: SP:71-2018	Guidelines for Design and Construction of Precast Pre-tensioned Girders for Bridges (First Revision)
6.	IRC: SP-105-2015	Explanatory Handbook to IRC:112-2011: Code Practice for Concrete Roads Bridges
7.	IRC: SP-109-2015	Guidelines for Design and Construction of Small Diameter Piles for Road Bridges
8.	IRC: SP:114-2018	Guidelines for Seismic Design of Road Bridges
9.	IRC: SP:115-2018	Guidelines for Design of Integral Bridges
10.	IRC: SP:116-2018	Guidelines for Design and Installation of Gabion Structures

II. OTHER RELEVANT PUBLICATION OF IRC AND IS

Use of Standard Design Drawing

Depending upon the site condition and other factors the consultants shall use the Standard Design/Drawing of Superstructure for the part(s) of the bridge where the total length of the bridge shall limit to 45m and carriageway width of 6.0m, which shall be made available by the RBS/DoLID. This matter shall be discussed and finalized during the presentation or at a later stage convenient to both parties. If such Standard Design is used the consultants shall adjust the design of other parts of the bridge to incorporate the parameters of the Standard Design.

If it is decided to use any Standard Design, the payments shall be adjusted according to the Conditions of Contract and/or as mentioned in the BOQ.

Design Calculations and Drawings:

Prepare detailed design calculations, drawings along with Construction Methodology, Bill of Quantity and Detailed Cost Estimate of the bridge following the Design Parameters and Standards described above.

Checklist of the report

The basic requirements of the design report are given in the checklist at the end of this TOR. Before submitting the report, the consultants should verify whether it complies with the checklist but the content of the report shall not be limited to the contents of the checklist.



DELIVERABLES

The consultant shall submit the following deliverables for each assigned project, in both hard copy and soft copy (PDF and editable formats). Please refer to the Checklist-2 provided with this TOR for number of copies and basic requirements of the reports

Conceptual Report:

This report shall provide the detailing understanding of ToR, proposed methodology, and work plan. This report shall contain bridge location with alternatives, bank conditions, general geology, general hydrology, location plan, Environmental suitability, social acceptability, proposed bridge type with length, span arrangement and bridge cross section geometry etc.

This report shall contain the design concepts and short descriptions relating to the proposed structure and its major components, e.g. superstructure, pier, foundations river training/ bank protection structures, approach road etc. It shall include tentative location of proposed foundations and arrangement of the bridge components along with comparison between the possible alternative types. **The consultant shall make a presentation of the report to the DoLID before proceeding to detail design of the bridge.** DoLID may also ask the consultant to invite its key experts who are involved in the field works and bridge design works. The cost and meeting allowance of DoLID personnel (maximum 10 personnel) in such presentation shall be borne by the consultants.

Please refer to the Checklist-1 provided with this TOR for number of copies and basic requirements of the reports

Draft Report

This report shall in all respect be complete, containing all the required components of the design and drawing. This shall be presented in clear and lucid formats as per the general design guidance attached. Please refer to the Checklist-2 provided with this TOR for number of copies and basic requirements of the reports. The report shall also include the drawings, quantity and cost estimate. DoLID shall ask the consultant to organize a discussion workshop after going through the draft report. Representatives of DoLID shall put forward their suggestions and queries to the consultant's team of experts; the consultant should respond to such queries and justify their rationale in the raised issues. The cost of such discussion workshop shall be borne by the consultant.

Particulars	Required information / number / range / value(s)
Volume I - Main report	Draft – 1 copy;
Volume II – Drawings	Draft – 1 copy;
Volume III – Design calculations	Draft – 1 copy;

Final Detail Design Report:

Consolidating all findings, designs, and recommendations. Apart from the presentation, the RBS/DoLID will verify the content of the report against the Terms of Reference. The RBS/DoLID



may also discuss upon the technical content of the report and may suggest some changes if found necessary. While preparing the Final Report the consultants shall consider such comments/suggestions and make corrections or amendments if necessary. It does not, however, relieve the consultants of their responsibility over the technical content of the design.

i. No. of Copies and volumes of Final Report

Particulars	Required information / number / range / value(s)
Volume I - Main report	Final – 3 hard copies, one electronic copy
Volume II – Drawings	Final – 3 hard copies, one electronic copy
Volume III – Design calculations	Final – 3 hard copies, one electronic copy

ii. Soft copy (electronic copy) of the design

Apart from the bound hard copies of the final report the consultants shall submit electronic copies of the final report in CD-ROMs as specified in the checklist

Soft (electronic) copies of the report 1 copy in Usb Pen drive /hard drive with hard plastic case

Soft (electronic) copies of the report	1 copy in in Usb Pen drive /hard drive with hard plastic case containing raw file like Auto Cad, Excel, Word, pdf file etc.
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TEAM COMPOSITION (INDICATIVE) AND QUALIFICATIONS

a. Personnel: The detailed engineering survey necessitates a multidisciplinary team including a Bridge/Structural Engineer as a Team Leader, Geologist, Hydrologist, Environmental Engineer, Surveyors, Chainmen, and Helpers.

Key personnel must possess the following minimum qualifications and experience, with relevant professional registration (e.g., Nepal Engineering Council):

Personnel	Preferred academic qualification
Team Leader (Bridge/Structure Engineer)	Master's degree in Structural Engineering, 10 years of general experience and 5 years of specific experience in design of motorable bridges.
Environmental/Forestry Specialist/Ecologist	Master's degree in Environmental engineering or equivalent, 7 years of general experience and 5 years of specific experience in similar assignment.
Geotechnical Engineer	Master's degree in Geotechnical Engineering or equivalent, 7 years of general experience and 5 years of specific experience in geotechnical investigation and foundation design of motorable bridges.
Hydrologist	Masters in Hydrology with 7 years of General experience and 5 years of specific experience in hydrological analysis of bridges.
Road/Highway Engineer	Master's degree with 7 years of general experience and 5 years of specific experience in detailed engineering survey and design



	of motorable bridges.
Surveyor	Minimum Diploma in the Civil Engineering with 5 years of General experience and 3 years of Specific Experience.

b. Equipment: The consultant is responsible for providing all necessary surveying equipment and logistics, including precision automatic levels, total station to assist the Engineer in checking setting out and agreeing levels. The firm allow/encourage to modern survey equipment (e.g. GPS, LiDAR, drone-based systems) and geotechnical tools (e.g., drill rigs).

The Consulting Firm/Team must be registered with Nepal's Office of Company Registrar and have a valid VAT certificate.¹ The firm must own or have access to necessary survey and drilling equipment (e.g., 4WD vehicles, Total Station, borehole rigs). Joint Ventures must submit a clear agreement and prioritize package selection.

DURATION OF THE ASSIGNMENT

The total assignment period is 7 months for comprehensive projects from the date of contract signing, with a possibility of extension based on project requirements and satisfactory performance.

Milestones (Indicative):

- **Conceptual Design Report** must be approved within 6 (Six) weeks started from the date of work order.
- **Draft Report** within 24 (twenty-four) weeks started from the date of signing of the Agreement. DoLID shall provide comments and suggestion within 4 weeks after draft report submission.
- **Final Report** within 2 weeks after receiving DoLID's Comments and suggestions on the draft report.

PROFESSIONAL LIABILITY/ DEFECT LIABILITY

Responsibility for survey and design, Estimate and engineering drawing

Submission of the final reports does not relieve the consultant from their responsibility to the design. They shall bear full responsibility for the following but not limited to them:

- Authenticity of all the field data including socio-economic, environmental, topographic, hydrological and geological information;
- Correctness of the design and all the calculations (except for the Standard Design, if used)
- Correctness of the drawings;
- Correctness of any other details related to construction

Assistance during construction phase

During the construction phase of the bridge, the consultants, upon written request from the DoLID, shall visit the bridge site and provide necessary technical assistance. The consultants shall be paid for such visits (travel cost and daily allowances) as per the approved norms only if the issue of site visit arises due to the causes beyond the scope of detailed survey, design and drawing works.



However, if any changes in the design are required, the consultants shall furnish it free of cost as per the Condition of Contract.

Acceptance of responsibility

The Consultants shall submit signed Statement of Acceptance of Responsibility attached together with the final report. Team leader shall sign (NEC registration number) every page of the Report. Geotechnical engineer shall sign (NEC registration number) every page of geotechnical report. Similarly, Hydrologist and Structural Engineer shall sign (NEC registration number) and verify every page of the hydrological report and structural design report respectively.

Confidentiality and Ownership

All information, data, and reports generated or accessed during the course of this consultancy shall be treated as confidential and shall remain the property of the Client. They shall not be disclosed to any third party or reproduced without the prior written consent of the Client.

Performance audit

DoLID may carry out performance audit of consultant's work of at least one bridge in each package by appointing third party individual, or a consulting firm. Consultant shall make available the design team during performance audit. The consultant shall be responsible and shall clarify the issues raised during performance audit.

The design issues such as uneconomical design, unsafe design etc. if proved during performance audit, the consultant shall be liable for any further actions suggested by the performance audit as per the prevalent laws of Nepal.

Coordination with Department of Local Infrastructure Development /Project offices

The consultant shall perform all field works like soil investigation work in close coordination with the respective authorized personnel from DoLID and LIDPO offices. DoLID (Road and Bridge Section) shall assist the consultant for such coordination. During the field visit, the consultant's authorized representative along with the key personnel associated with the work (geotechnical engineer for soil investigation, hydrologist for hydrological survey) must be present in the site/field works. If the respective key personnel are not present during his/her area of expertise, DoLID shall have full authority to reject the work.

Ethical Standards

The consultant shall adhere to Nepal's Anti-Corruption Act, 2002, and maintain transparency in all data collection, analysis, and reporting. Engagement with local communities must be respectful, ensuring minimal disruption and promoting inclusive development.

PRESENTATION OF CONSULTANT'S REPORT/ WORK

The consultant shall make a presentation of the report/activities to the DoLID at following stages:

1. After preparation of conceptual design and before draft report.
2. After preparation of draft report.



3. Final report.

Team Leader shall be present in each of the presentations and respective key personnel shall be present in presentations which includes his/her area of expertise. DoLID may ask for more presentation if required. However, the number of presentations shall be as per the requirement of the client before approval of final report.

TRANSFER OF KNOWLEDGE:

As a part of “Transfer of Knowledge”, the Consultant is required to perform the tasks as indicated in the table below during Design phase;

Tasks	Requirements
- Technology Transfer on Bridge Site Selection & Bridge Layout - Technology Transfer on major issues on Hydrologic and Geological Investigation and Review of DPR - Issues of Quality Control in Bridge construction. - Modern Technology on Bridge Construction The Consultant shall propose the modality of Technology Transfer to the client which shall not be less than 40 Hours.	Required

The cost of this task to the Consultant is supposed to be included in the costs stated in the Price Schedule. Failure to perform will result in deduction of NRs 50,000.00.

PAYMENT SCHEDULE

The consultant will be paid on a milestone-based payment as per the agreed contract. Specific payment terms will be detailed in the consultancy agreement.

The consultant shall be paid as described below.

Item	%	Remarks
Submission of Conceptual Design Report and acceptance from DoLID.	20% of the Total agreement	
Submission of Draft Design Report and acceptance from DoLID.	50 % of the Total agreement	(Will be reduced as indicated in the Price Schedule if existing standard drawing has been used)
Submission of Final Design Report, all other deliverables as per Contract Agreement and acceptance from the Section Chief.	30 % of the Total agreement	



SOFT(ELECTRONIC) COPIES OF THE PART OF THE REPORT

One copy of the report in electronic files should be submitted in Pen Drive/ hard drive, which shall include the following:

- Text of main report (in MS Word format)
- Rate analysis and cost estimates (in MS Excel format)
- All the drawings in format compatible to AutoCAD.

Appendices:

The following should be submitted as appendices to the main report:

- Laboratory test results of subsoil strata as specified in the TOR
- Detailed rate analysis
- Certified district rates
- Professional liability declaration by each expert.

CHECKLISTS

APPLICABLE STANDARDS AND GUIDELINES

The assignment must comply with, but not be limited to, the following:

- Nepal Road Standard (NRS), 2070.
- Standard Specifications for Road and Bridge Works, 2073 (with amendment 2075).
- Nepal Bridge Standards 2067.
- Nepal Bridge Site Selection and Design Guidelines.
- Nepal Bridge Design Manuals
- Guidelines on Hydrologic and Hydraulic Analysis and River Training Works for Bridges Design
- Nepal Building Code (NBC) 105:2020 (for seismic design parameters).
- Nepal's Environmental Protection Act, 2019.
- Environment and Social Management Framework (ESMF).
- Nepal's Water Resources Act, 1992.
- Nepal's Public Procurement Act, 2007 (and its regulations).
- Relevant international best practices (e.g., IRC, AASHTO).

Checklist-1 For Concept Design Report

This section serves as a guideline for checking the detailed engineering survey and design of bridges, received from the consultants. General procedure for checking the design report:

Checklist for content of the package:



Particulars	Required information / number / range / value(s)
Volume I – Concept Design Report	– 1 copy;
Volume II – Drawings	– 1 copy

The Report shall include detail of

- Field works
- Detail engineering study and survey
- Hydrology
- Sub-soil investigation and Geotechnical Report

Content of Concept Design Report provides selection of type of bridge, its length and span arrangement, substructure and foundation type, its arrangement is determined after desk study and field including subsoil exploration along with geotechnical analysis on the basis of the following parameters;

- Linear waterway;
- Type of river bed and banks
- Geo-technical stability;
- Constructability and;
- Cost effectiveness

The report should present a final recommendation on type of superstructure, foundation and substructure including comparative technical and economical evaluation of at least three possible alternatives on the basis of the above parameters. The type of bridge is discussed with the DoLID before detailed design. The report should include the gist of discussion and conclusion

Checklist-2 For detailed survey and Design of bridges

This section serves as a guideline for checking the detailed engineering survey and design of bridges, received from the consultants.

General procedure for checking the design report:

Checklist for content of the package:

Particulars	Required information / number / range / value(s)
Volume I - Main report	Draft – 1 copy; Final – 3 copies
Volume II – Drawings	Draft – 1 copy; Final – 3 copies
Volume III – Design calculations	Draft – 1 copy; Final – 3 copies
Soft (electronic) copies of the report	1 copy in hard disk/pen drive with hard plastic case containing word, Auto CAD, Excel, pdf.

One copy of each volume of final report shall be provided in color print. EXCEPT volume II- Drawings.

Content of Main Report (Volume I)

- Statement of acceptance of responsibility:

A signed acceptance of responsibility to the authenticity of field data and correctness of design shall be attached to each copy of the main report.



Salient features:

Particulars	Required information / number / range / value(s)
Name of the Project:	Job description as mentioned in the work-order
Location:	
Province	Name of the province
District	Name of the district
Municipality / Rural Municipality	Name of the municipality or rural municipality
Village/town	Name of the surrounding town/municipality or any pertinent landmark in the vicinity of the bridge.
Name of the Road:	Popular / formal name of the road (e.g. Prithvi Rajmarg) and road reference number from the SRN data (if applicable)
Origin and Destination of the Road	Origin and destination (e.g. Naubise – Pokhara)
Chainage of the Bridge Site	Chainage from the origin of the road
Geographical Location:	
Easting	East coordinate
Northing	North coordinate
Classification of the Road	NH / FRN / FRO / DR / UR / Other
Type of the road surface	BT / GR / ER / Track only
Terrain / Geology	General terrain (Hill, mountain or plain) and general geology
Information on structure:	
Total length of the bridge	Total length between edges of the end decks
Span arrangement	Number * effective lengths of spans
Total width of the bridge:	Total width between edges of the deck
Width of:	
Carriageway:	Clear width available to vehicles
Footpath(s):	Clear width available to pedestrians
Kerbs	Width at the bottom of the kerb
Type of superstructure:	Overall system (e.g. Three girder RCC T-beam & deck / <Type> Steel truss & RCC deck / Four Steel plate I-girders & RCC deck, Continuous, Integral, Rigid frame, Arch, Prestressed concrete etc.)
Type of bearings:	Type of bearings with their dimensions
Type of abutments:	Shape and material in the abutment (e.g. Rectangular RCC with cantilever return wall, or RCC isolated columns with stone pitched slope and wing walls, etc.)
Type of pier(s):	Shape and material (e.g. Rectangular solid / hollow RCC wall, or RCC Hammer-head with solid circular body, etc.)



Type and depth of foundations:	Type and depth from the maximum scour level. Separately for each, if type and depth of foundations for different units are varying
Sketches:	Sketches of the general arrangement of the bridge with gross dimensions (plan, elevation and cross section) in a reduced scale from the main drawings to be attached in A4 or A3 size sheet.
Design data:	
Live load:	Load classes considered
Net bearing capacity of soil:	Net bearing capacity applied in design
Catchment area:	
Design discharge:	
Linear waterway:	
Scour depth:	
Grade of approach roads:	
Summary of quantities of materials:	
Grade and quantity of concrete:	
In superstructure:	Grade and total quantity including girders, deck, parapet, kerb, footpath, railings and approach slab
In substructure:	Grade and total quantity including pier/abutment cap, stoppers, abutment return-walls, ballast wall, pier/abutment stem above pile/well cap and in case of open foundation above base-plate.
In foundation:	Grade and total quantities of pile/well cap, well steining and curb, piles, foundation base-plate and other accessories.
Grade and quantity of structural steel:	
In superstructure:	Steel grade and quantities of truss members, gusset plates and nut-bolts, plate girders including accessories,
In substructure:	Grade and quantity (if any) in abutment/piers
In foundation:	Grade and quantity in foundation (e.g. well-shoe, pile tips etc.)
Grade and quantity of reinforcing steel:	
In superstructure:	Grade and total quantity as in quantity of concrete
In substructure:	Grade and total quantity as in quantity of concrete
In foundation:	Grade and total quantity as in quantity of concrete
Quantities of other materials:	
Stone masonry:	Total quantity (e.g. in wing walls, foundation base, river protection works etc.)
Gabion works:	Total quantity (e.g. in wing walls, river training and riverbed protection works etc.)
Formworks:	Quantities in superstructure, substructure, foundation and others if any.
Timber:	Total quantity excluding formwork and staging.
Other:	



Summary of cost:	
Superstructure:	
Substructure:	
Foundation:	
Approach road:	
River training works:	
Total net cost of the bridge:	
Total gross cost of the bridge:	

Field works:

The following should be complied with at the proposed bridge site.

Centerline of the proposed bridge axis and alternative axis	Three R.C.C. posts (1:2:4) of 15cm x 15cm in section and 1m length each should be installed minimum 30m apart and flushing in the ground in center line of the bridge. Iron rods of not less than 15cm in length and 8mm in diameter fixed in center and flushing top surface of each post shall form the centerline of the bridge. All posts shall be installed beyond the zone of inundation and there should be at least one post on each bank of the river.
Bench Marks	Similar posts (at least one post in each bank) should be fixed in the right of way and beyond the zone of inundations as Bench Marks, whereon B.M. No. and elevation must be written in fast color paint on two opposite faces of the post. If permanent structures are available, they can be used for B.M. in lieu of the posts. All central line and Bench Mark posts should be connected with sufficient permanent reference points with photo D-card of each BM. Minimum 3 BM shall be provided on each bank of the river.
Bore/drill logs	Bore/drill logs should be certified by the geo-technical engineer of the consultant in the presence of client or client representative.

1.4 Description of Detailed Engineering Study and Survey:

Geology and topography	General description of geologic and topographic parameters as per section 1.4.3.3 and 1.4.3.4 of the TOR. Specific geo-technical and topographic parameters shall appear in the design calculations and drawings, respectively.
Hydrology	General description of hydrological aspects as per section 1.4.3.7 of the TOR. Detailed hydrological parameters shall appear in the design calculations and drawings. The main report should have information on: Catchment area characteristics



	Summary of rainfall data Stream / channel characteristics including: Type of river Flood characteristics HFL, LWL and afflux Depth of scour Summary of discharge calculation by various methods and determination of design discharge Determination of effective linear waterway, bridge span arrangements and freeboard. Summary of required river training works with their justification
Feasibility/selection of the bridge site	The report should review existing studies (if available) and field data to decide upon the technical feasibility of the bridge site. The bridge site should be selected among at least three locations. Selection criteria shall incorporate geo-physical, topographic, hydrological, social, environmental and economic parameters. The bridge site is discussed with the DOLID (Road and Bridge Section)/ LIDPO representatives. The report should present a gist of the discussion and conclusion.
Selection of bridge type, length and span arrangement	The type of bridge, its length and span arrangement are determined after desk study and field works except detailed subsoil exploration on the basis of the following parameters: Design discharge General and maximum scour depth Linear waterway to be provided Anticipated soil condition Selected bridge site River training and approach road Construction/maintenance cost Availability of material and labour <i>The report should present a <u>general</u> comparative evaluation of different types of bridges on the basis of the above parameters for identifying number of bore log required. Location of bore logs is discussed with the DOLID before proceeding to soil investigation and detailed design. The report should include the gist of discussion and conclusion.</i> After completion of subsoil exploration final recommendation of the foundation type and superstructure shall be carried out based on <i>the linear waterway and Scour depth;</i> <i>the type of river bed and banks</i> <i>Geo-technical stability;</i> <i>Constructability;</i> <i>Cost effectiveness</i> <i>Comprising at least three possible alternatives.</i>



Environmental study	The report should review the project as per the Environmental Protection Act, Environment Protection Rules and DOLID environmental policies including Environmental and Social Management Framework (ESMF), modified by DOLID for bridges and recommendation of environmental study.
Seismological study	The report should review the information and past seismic records of the project area as per section 1.4.3.5 of the TOR.
Sub-surface exploration	The subsurface exploration shall proceed after conceptual design of the bridge and axis conforming to the requirement as per section 1.5 of the TOR. The main report should include the following: General description of the subsoil strata Bore logs Sectional elevation of the subsoil strata showing locations of bore-holes and proposed foundations <u>Net bearing capacity, selection of foundation and its depth on the basis of the above parameters.</u> Detailed analysis of subsoil strata and test results shall appear in Design Calculations and Appendix-1

Design of bridge

Design parameters and concepts	The detailed design of the different parts shall appear in Design Calculations. The main report should include the following: Design parameters: Discharge, HFL, LBL, free board, scour depth, waterway, and loads considered. Design concepts of superstructure, sub structure and foundation. Determination of design standards; methods adopted and codes followed. Requirement of river training and bed protection works concepts of design of such structures.
Summary of design	Summary of design should include the followings: Type and length of spans, Effective cross section, design forces and reinforcement of slab, main girders, cross girder; lucid diagrams of such design forces and stresses shall be included; Type, sections and reinforcement of elements of substructures; Type and details of bearings; Type, depth, sections, reinforcement of foundation body and footings, Dimension and reinforcement of approach slab. Design parameters of approach road: width, surface type, maximum and average gradient, minimum radius of curves
Hydrology	
Hydrological data	1. Catchment area characteristics: - The catchment area size, shape (classified as fan, pear, long or narrow), slopes (Longitudinal and Cross-sectional). - Surface characteristics (whether sandy, clayey etc. including percolation and interception characteristics).



	- Whether land is under afforestation, deforestation or is dotted with urban areas, cultivated areas or storage areas, e.g. lakes, swamps, tanks, reservoirs etc. shall be determined. 1. Rainfall Data: - Maximum in 24 hours. - Maximum in any one hours. - Rainfall distribution in the catchment area. - Duration and frequency of the rain. - Rain gauge data of the storms along with the corresponding stream gauge data (data for unit hydrograph). - Average annual rainfall characteristics (from latest relevant meteorological records). - Probability plotting (a graph plotted between the flood magnitude against its return period). Stream / channel characteristics 1. Type of river - Seasonal or Perennial. - Meandering or straight. - Other classification, e.g. bouldery, flashy, well defined, tidy etc. - Length, slope, cross-sections of the river. 2. Water Level - Highest flood in living memory and other major floods before start of investigation. - Highest flood level and year of its occurrence, showing the areas flooded. - Records of flood gauging stations. - Lowest Water Level (LWL). - Afflux, if observed. - Observed maximum depth of scour and scour level, indicating what obstruction if any, and other special causes, which can be responsible for the scour at site.
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	- Sediment Data, indicating bed material particle size, aggradation (degradation of bed, bank erosion (reference to flood stage) etc. - Erodibility of riverbanks and river bed. - Scour Data (as observed, particularly downstream of any obstructions to the flood flow).
Analysis of hydrological data and determination of associated elements	• Discharge calculation by various methods including WECS method, comparison of discharges, determination of design discharge expected to pass under the bridge and justification for adapting the design discharge, natural stream velocity and flood velocity. • Maximum mean or maximum velocity of flood flow. • Effective linear waterway required under the bridge (after allowing for average thickness of each pier and its foundation, between High Flood Level and Normal Scour Level, ignoring the earth fills in front of the abutment). • High Flood Level, Afflux and Water Level. • Freeboard required between the affluxes High Flood Level and soffit of deck from the considerations of unobstructed flow of floating debris with the flood discharge. • Normal and Design (maximum) scour levels at piers and abutments (Consider higher watermarks in the area and at and near the site). • Minimum founding levels at piers and abutments from consideration of maximum scour etc. • Detail Hydraulic analysis for River Training Structures
Sub-soil investigation.	
Investigation data	• Bore-log of each bore-hole showing: Depth gauge, soil description of encountered layers with depth marks, sample collection points, depth and types of tests performed, Ground water table, number of blows for SPT/CPT, N-values • Each bore-hole log shall be properly certified and signed by the geotechnical engineer of the consultant. • Certificate of sub-soil investigation from respective Division / project office indicating depth of each bore-hole and confirming that soil-samples of each strata in each borehole are deposited in core boxes for the record. • Laboratory test result of the samples as specified in the TOR.



	• Systematic photographs of the core boxes. The core boxes containing the soil sample shall be provided by consultant when client asked for it.
Analysis of sub-soil data	• Determination of bearing capacity and other parameters at different depths required for different types of foundations, determination of design bearing capacity. • Comparison and determination of type(s) of foundation for abutments and piers. • Summary of subsoil characteristics and types of foundations. • Analysis mentioning any precaution or any special construction method required for the construction of proposed foundation, Possibility of artesian and requirement of dewatering arrangement shall be included in analysis report of subsoil data. • Determination of weighted mean diameter of river bed material for calculation of scour depth.

Cost estimates

Summary of cost	Total cost including cost of bridge, approach roads, river training works, other accessories Net cost per running meter of bridge only Total cost per running meter Abstract of quantity and cost
Rate analysis	The rate analysis should be done following the current norms on the basis of comparative cost of materials such as boulders, stone aggregates, sand, river / quarry gravel collected at sources and direct market price. The report should include: A short description of material sources Lead distances from sources and market Comparison of cost of material collected at sources and purchased at market. Labour rate Summary of unit rates Detailed rate analysis and a copy of certified district rates should be submitted in Appendix separately.

Content of Drawings (Volume II)

General	Size: All the working drawings are presented in size A3 sheets, with binding properly.
Format of cover page	The cover page should show the following: Name and address of client, Contract number, work description, volume Consultant's name and address Month and year of completion



Format of other pages	All other pages should show the followings at the bottom of the sheet (bottom box): Name of the client; Work description Drawing title <i>Columns providing signature, name and Nepal engineering Council registration number of major experts involved in service i.e. of Bridge/Structural Engineer, Geotechnical Engineer and Hydrologist.</i> Designation & signature columns for consultant: designed by, checked by, Approved by Consultant's name and address Scale of the drawing Drawing no./sheet no. The size of letters anywhere in all sheets shall not be less than 2 mm. All other pages should contain one column box just above bottom box at right bottom of the sheet and should be left blank with title mentioning “FOR OFFICE USE ONLY”
Content of the drawings (Volume II)	- General Information Contents 1.1 General notes - list of concrete grades used with respect to the components/locations - concrete covers with respect to the components/locations - reinforcement design properties - bar mark designation system - summary of design calculation in concise form - Material Properties. - Design Parameters - Other special note useful for bridge construction 2.1 Index map - Map of country (length 8 to 10 inches) with location highlighted, location plan showing road network, river system and names of places. 3.1 Topographical map - Plan of bridge site (scale not exceeding 1:1000) covering a minimum distance of 500 m u/s, 200 m d/s, 200 m from the river banks on either side of the river at proposed bridge site showing: - contour intervals of 1m & 0.25 m for plain and hilly area respectively - Flood lines on either side of the river in the entire area surveyed. - Lines with spot levels along which the bed slope of the river is taken - Both banks of the river - Locations of bore-holes and bench marks - Plan of the bridge - Bridge axis reference index - Govt/public establishments.



	- Traverse lines, benchmarks reference lines and/or points with respect to which the present topo map is prepared - The angle and direction of skew, if the bridge is proposed to be aligned skew - The names of the nearest identifiable-village/towns etc in either ends of the bridge - Other information pertinent to design, construction and/or maintenance of the bridge. 4.1 Catchment Map Catchment area map in suitable scale - Catchment area of the river up to bridge site - Length of the river from origin up to bridge site - Slope of the river from the critical point (origin) of the river up to bridge site and general slope of the catchment in both sides of the river. - Maximum discharge calculated by established formulas with different return periods - Maximum discharge during highest flood, at each cross section. (By x section area & slope method). The peak discharges as observed over a period of 100 years (for important bridges) or 50 yrs. (ordinary bridges) as the use may be an average of peaks is taken - Velocity and depth of flow at the time of survey at the bridge location - Shifting of the river in the past at proposed bridge site and in vicinity of it. - Other information required for river control, design, construction and/or maintenance of the bridge. - L-section of river & C/S of river 5.1 Photo D-Card of Bench Mark and Bridge layout data 6.1 General arrangement ○ Plan, elevation of bridge structure with provide information of bearing and expansion joint as per design. And side elevation ○ Bore logs presented on elevation and location ○ Bridge design team information with signature ○ Pile load test data if applicable 7.1 Structural Drawing - Structural drawings with bar bending schedules including in the respective sheets ○ Foundation and Sub Structure ▪ Concrete outline of abutment and Piers ▪ Reinforcement detail of abutment and Piers ○ Super Structure
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	▪ Concrete outline of Main girder, Cross girder and Deck Slab ▪ Reinforcement detail of Main girder, Cross girder and Deck Slab ▪ Super Structure Miscellaneous Details ▪ approach slab details ▪ Details of bearing (including bearing design data), railings, drainage systems and expansion joints etc. 8.1 Detailed river training works 9.1 Topographic Map including Plan, Profile and Cross section 10.1 Plan, profiles and cross section of the approach roads on both side of the bridge 11.1 Miscellaneous
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Content of Design Calculations (Volume III)

Detailed analysis and design calculation of following elements should be provided. The design calculations should mention the governing design code or guideline wherever they are applied.

Salient Features of the Design	Salient features of the design shall be presented in tabular form and shall consist of - Design parameters: Discharge, HFL, LBL, free board, scour depth, waterway, and loads considered. - Summary of geotechnical investigation and recommendation. - Type and length of spans, - Effective cross section, design forces and reinforcement of slab, main girders, cross girder or the component of superstructure along with the code requirements, the design forces and stresses shall also be shown in lucid diagrams - Type, sections, load, stress of the major component and reinforcement of elements of substructures; - Type and general details of bearings; - Type, depth, sections, reinforcement of foundation body and footings, - Design parameters of approach road: width, surface type, maximum and average gradient, minimum radius of curves - River training and bed protection works summary
Design of bridge elements	On the basis of the topographic survey, hydrological, sub-soil and seismological analysis the report should present detailed design of the following parts of the bridge:



	• Design of superstructure and its parts: deck, main and cross girders, bearings, railing posts, bracings, stiffeners, joints etc. as applicable. • Design of substructure: pier/abutment cap, substructure body • Design of foundation and its part: foundation base, well/pile cap, well steining, pile grouping, individual pile body, pile head, cutting edge, top/bottom plug as applicable. • Design of river training works • Design of approach roads
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All the contents of the drawing and summary of reports shall be signed by the respective expert involved, in the format mentioned below: -

Name of Personnel	Designation	Signature	Professional council number



Check list 3; Declaration

Declaration

We the under signed professionals declare that during the course of preparing the Detailed Project Report of Bridges under *{Contract Package}* we were assigned for our respective professional service by *{Name of Consultant}* and we were fully involved in the assigned professional service throughout from inception to the final report preparation of this DPR. Hence, we understood and fully agree to take the Professional Liability of the work accomplished for accuracy, interpretation, analysis, design etc. contained in this report and shall be accountable at any time in the future in due course of implementation of mentioned project under the contact package by any government agencies.

Name of Key Professional	Position	Signature	Contact Detail (Mobile No./E-mail)

On behalf of *{Name of Consultant}* we undersigned the authorized representative of *{Name of Consultant}* declare that as per the agreement made between *{Name of Client}* and *{Name of Consultant}* for preparation of Detailed Project Report of bridges under *{Contract Package}* dated *{Contract Agreement Date}* above signatories were professionally assigned for the accomplishment of mentioned consulting service for their respective professional service throughout the inception to the final report preparation of this DPR. In addition to the professional liability of the mentioned signatories, we assure you that we shall be fully accountable for the job accomplished by them institutionally at any time during the due course of implementation of mentioned project in the future. In case if any of the above information is found to be false or untrue or misleading or misrepresenting, we are aware that we may be held liable for it.

Name of Authorized Representative :

Signature:

Name of Firm:

Stamp:

Date:



(This Declaration is mandatory during report submission)

Priority Form (Mandatory)

Name of Consultancy Firm/JV: - Address: -

Priority Number	Package Number.	Remarks
1		Please fill package no. as “1”, “2”, “4” in respective priority order
2		
3		
4		
5		
6		
7		

Sign and Seal: -

Date: -

Note: - In case where priority form is not submitted, a default priority shall be filled in ascending order of contract number E.g.- 1,2, 3.....7