



NATIONAL HIGHWAY AUTHORITY

Procurement & Contract Administration Section

28-Mauve Area, G-9/1, Islamabad Tel: 9032727, Fax: 9260419

No. 6(510)/GM(P&CA)/NHA/2020/510 Islamabad, December, 2020

Director General

Public Procurement Regulatory Authority
1st Floor FBC Building near State Bank,
Sector G-5/2, **Islamabad**

Subject: **ANNOUNCEMENT OF EVALUATION REPORT (PPRA RULE-35):
Consultancy Services for Feasibility (Technical + Commercial)
Study and Detailed Design for Construction of Shahdara
Flyover on N-5 on Build-Operate-Transfer (BOT) Basis under
Public Private Partnership (PPP) Modality**

Reference: *PPRA Rule-35*

Find enclosed herewith the combined Bid Evaluation Report along with Evaluation Criteria (Annex-I) for the subject Services in line with PPRA Rule-35 for uploading on PPRA website at the earliest, please.


04.12.20
(MUHAMMAD TANWEER ISHAQ)
General Manager (P&CA)

Encl: Evaluation Report along with **Annex- I**

Copy for kind information to:

- Member (Planning), NHA, Islamabad;
- Director (Tech. to Chairman), NHA, Islamabad;
- Director (P&CA)-III, NHA, Islamabad.

EVALUATION REPORT

(As Per Rule 35 of PP Rules, 2004)

1.	Name of Procuring Agency:	National Highway Authority
2.	Method of Procurement:	Single Stage Two Envelope Procedure
3.	Title of Procurement:	Consultancy Services for Feasibility (Technical + Commercial) Study and Detailed Design for Construction of Shahdara Flyover on N-5 on Build-Operate-Transfer (BOT) Basis under Public Private Partnership (PPP) Modality
4.	Tender Inquiry No.:	6(510)
5.	PPRA Ref. No. (TSE):	TS430502E
6.	Date & Time of Bid Closing:	1 st October, 2020 at 1130 hours local time
7.	Date & Time of Bid Opening:	1 st October, 2020 at 1200 hours local time
8.	No of Bids Received:	Five (05) Proposals were received
9.	Criteria for Bid Evaluation:	Criteria of Bid Evaluation is attached at Annex-I
10.	Details of Bid(s) Evaluation:	As below

Name of Bidder	Marks			Evaluated Cost (EC)* (PKR)	Rule/Regulation/ SBD**/Policy/ Basis for Rejection / Acceptance as per Rule 35 of PP Rules, 2004.
	Technical (if applicable)	Financial (if applicable)	Total (out of 1000)		
1) M/s Finite Engineering (Pvt.) Ltd. in JV with M/s Prime Engineering & Testing Consultants (Pvt.) Ltd. and M/s ECOS (SMC-Pvt.) Ltd	595	200	795	14,461,205	Top scoring firm in combined evaluation (PPRA Rule 36(b) (ix))
2) M/s Associated Consulting Engineers Ltd. in JV with M/s Associated Consultancy Centre (Pvt.) Ltd. and M/s ZAK Consulting Engineers	610	156	766	18,504,073	2 nd
3) M/s SAMPAK International (Pvt.) Ltd	467	Financial Proposal not opened			PPRA Rule 36(b) (v)

EVALUATION REPORT

(As Per Rule 35 of PP Rules, 2004)

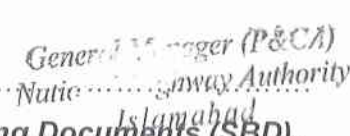
Name of Bidder	Marks			Evaluated Cost (EC)* (PKR)	Rule/Regulation/ SBD**/Policy/ Basis for Rejection / Acceptance as per Rule 35 of PP Rules, 2004.
	Technical (if applicable)	Financial (if applicable)	Total (out of 1000)		
4) M/s NESPAK (Pvt.) Ltd. in JV with M/s Latitude Engineering Consultant, M/s KPMG Taseer Hadi & Co. and M/s Axis Law	Not Evaluated (Ineligible)	Financial Proposal not opened			PPRA Rule 36(b) (v)
5) M/s Asif Ali & Associates (Pvt.) Ltd. in JV with M/s A.A. Associates and M/s IQ Capital Plus	Not Evaluated (Ineligible)	Financial Proposal not opened			PPRA Rule 36(b) (v)

*EC is the Evaluated Cost used for evaluation purpose and includes only the cost of competitive component (i.e. Remuneration and Direct Non-Salary Cost) and is exclusive of Provisional Sum, Contingency and Indirect Taxes.

Top Ranked Bidder: M/s Finite Engineering (Pvt.) Ltd. in JV with M/s Prime Engineering & Testing Consultants (Pvt.) Ltd. and M/s ECOS (SMC-Pvt.) Ltd

11. **Any other additional/supporting information, the procuring agency may like to share:** The Procurement was carried out in line with PPRA Rules & Regulations. The bidding was done on QCBS method with 80:20 Technical to Financial Proposals ratio. The Contract is being awarded to M/s Finite Engineering (Pvt.) Ltd. in JV with M/s Prime Engineering & Testing Consultants (Pvt.) Ltd. and M/s ECOS (SMC-Pvt.) Ltd at evaluated financial proposal of Pak. Rs. 14,461,205/-.

Signature:..... 04.12.20

Official Stamp:.....
General Manager (P&CA)
National Highway Authority
Islamabad
**Standard Bidding Documents (SBD).

National Highway Authority



Annex-I

Criteria

FOR

Bid Evaluation

**Consultancy Services for Feasibility
(Technical + Commercial) Study and
Detailed Design for Construction of
Shahdara Flyover on N-5 on Build–Operate–
Transfer (BOT) Basis under Public Private
Partnership (PPP) Modality**

December, 2020



NATIONAL HIGHWAY AUTHORITY

Procurement & Contract Administration Section
28 Mauve Area, G-9/I, Islamabad ☎ 051-9032727, 📠 051-9260419

Ref: 6(510)/DIR-III (P&CA/NHA/2020/171

Dated: 29th September, 2020

All Prospective Consultants

Subject: **Consultancy Services for Feasibility (Technical + Commercial) Study and Detailed Design for Construction of Shahdara Flyover on N-5 on Build – Operate –Transfer (BOT) Basis under Public Private Partnership (PPP) Modality**

“Minutes of Pre-Proposal Meeting & Addendum No.1 ”

Reference: Pre-Proposal meeting scheduled on 15th September, 2020.

Minutes of Pre-Proposal Meeting alongwith Addendum No.1 being integral part of RFP for the subject Consultancy services are enclosed herewith for necessary action, please.

(SAJJAD ALI SHAH)

Director (Consultancy) P&CA

Enclosure:

- **Minutes of Pre-Proposal Meeting (02 Pages)**
- **Addendum No.1 (01 Page)**
- **Attachments to Addendum No.1 (02 Pages)**

Copy for information to:

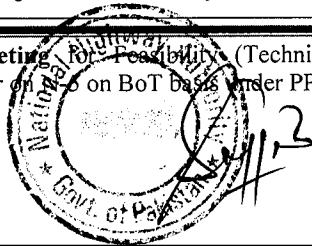
- Member (Planning), NHA, Islamabad;
- General Manager (Planning), NHA, Islamabad;
- General Manager (Design), NHA, Islamabad;
- General Manager (P&CA) NHA, Islamabad;
- Director (PPP) NHA, Islamabad;
- DD (MIS) NHA, Islamabad.

MINUTES OF PRE-PROPOSAL MEETING HELD ON 15th September, 2020

Feasibility (Technical + Commercial) Study and Detailed Design for Construction of Shahdara Flyover on N-5 on Build – Operate – Transfer (BoT) basis under Public Private Partnership (PPP) Modality

A Pre-Proposal Meeting was held in NHA Auditorium on 15th September, 2020 to discuss the Request for Proposal (RFP) for subject Services in the presence of NHA officials and prospective consultant. During the said meeting the prospective consultant submitted queries and their clarifications/ replies are summarized below for information of all prospective bidders:

Sr. No.	Queries	Reply
1.	No clarity in TOR is provided for differentiating the extent and details for surveys in various stage-wise activities for example; preliminary/detailed topographic, preliminary/ detailed soil surveys, preliminary/ detailed Hydrology study etc., (refer mode of payment page 35 Stage-II and Stage-III). The extent of details to be provided at various stages may please be clarified. We propose that only detailed surveys and studies should be carried out as part of Stage II. Otherwise survey teams would have to be mobilized twice and more time would be required and in addition separate TOR is required to be issued.	Not exceeded to, please proceed as per RFP.
2.	Considering the overall activities and deliverables, four month time period is less. It is requested to increase the time period for the study.	Not exceeded to, please proceed as per RFP.
3.	Mode of Payments has been distributed between Preliminary and detailed surveys however Financial Forms does not provide separate pay items for preliminary and detailed surveys. Payments terms to be changed accordingly.	Mode of payment is plan/ schedule of payment upon reports completion whereas in Financial Form consultants are advised to charge for their deliverables; where applicable.
4.	Man-months for PPP/Financial expert and Law expert are provided in the Para 6.26 while these are also provided in man-months for commercial feasibility study. Need Clarification.	Both are same just repetition. For clarification about man-month, refer to Clause 6.26 of the TOR, please.
5.	Mode of Payments(6 .25) provided the payment Mode for Geotechnical Investigation as PS while in financial forms, it is given as LS. Need clarification	It is clarified that mode of payment for Geotechnical Investigation is in LS not in PS. Please see Addendum No.1.
6.	Hydrology Survey and Report writing is missing in Pay items in the financial forms	Hydrology Survey and Report writing stand deleted from Clause 6.25; mode of payment. Please see Addendum No.1.
7.	Definition of new firm is that "the firm which has done maximum of three projects in last six years" and JV has to	Not acceded to, please proceed as per RFP.



Sr. No.	Queries	Reply
	give 20% share. There is hardly any small firm which has done only 3 projects in last 6 years. The definition of the small firm needs revision. We suggest it should be on the basis of financial turnover	
8.	Requirements for technical staff are overly restrictive and may please be reviewed for both senior and junior engineers. For example simply on the basis of degree (MSc or BSc) a difference of 9 points in each CV evaluation is being made. We propose the criteria should be revised to a) reduce the weightage for MSc degree and b) include number of years since BSc degree to qualify as equivalent to a MSc degree evaluation - for example a BSc with 15 years experience should be taken as equivalent to CV of MSc engineer with 12 year experience.	Not acceded to, please proceed as per RFP.
9.	In the industry, engineers with 12 years of experience would be at senior positions and not junior engineers. The criteria for junior engineers should be reviewed and revised to 5 years' experience.	Criteria for Junior positions are revised. Please see Addendum No.1.
10.	Payments percentage in Mode of Payments for "Preliminary Technical Study" and "Preliminary Commercial Feasibility Study" are quite less compared to inputs required. We suggest increasing the payment percentage matching to the inputs required.	Please see Addendum No.1.

... 000 0 000 ...



ADDENDUM No.1

Feasibility (Technical + Commercial) Study and Detailed Design for Construction of Shahdara Flyover on N-5 on Build – Operate – Transfer (BoT) basis under Public Private Partnership (PPP) Modality

Following amendments have been made in the Request for Proposal (RFP) for subject Services under this Addendum No.1, which shall be read and construed as an integral part of RFP and shall take precedence in case of any conflict(s)/ambiguity(s) amongst this Addendum No.1 and other provisions of the RFP.

1. **DATA SHEET**

Page 12 of the RFP has been revised. The revised page is attached at **Annexure-I to Addendum No. 01**.

2. **Appendix-A, Terms of Reference (TOR)**

Page 85 of the RFP has been revised. The revised page is attached at **Annexure-II to Addendum No. 01**.

3. All other terms and conditions shall remain same.

---ooOoo-



an alternative of JV member. Any personnel proposed for the Assignment but belonging to the so called associates shall not be marked in evaluation of technical proposal like in case of Sub-consultants (except individual Specialist Sub-consultants having unique expertise which is rarely available OR an expatriate Personnel) who are not supposed to contribute in qualification of their main consultants.

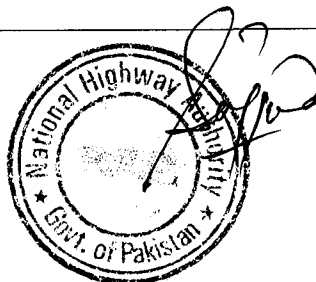
- d. Proposed key staff shall preferably be permanent employees who are employed with the consultants at least six months prior to submission of Proposal.

Yes No

The minimum required experience of proposed Key Personnel is given below:

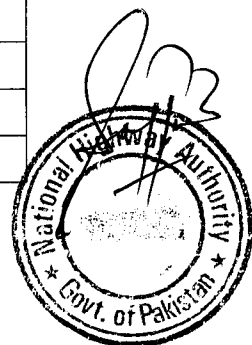
FOR KEY PERSONNEL

Team Leader / Senior Structural Engineer	<p>Education: Preferably M.Sc. (Structural Engineering) and minimum B.Sc. (Civil Engineering).</p> <p>Experience: Preferably twenty (20) years relevant experience [proven fifteen (15) years' design experience as Team Leader/ Sr. Structural Engineer on National Highways Projects];</p> <p>He/ she must also have performed as Team Leader for at least three (03) major Highway Design Projects.</p>
Senior Highway Engineer	<p>Education: Preferably M.Sc. (Transportation Engineering) and minimum B.Sc. (Civil Engineering).</p> <p>Experience: Preferably twenty (20) years' relevant experience [proven fifteen (15) years' design experience as Senior Highway Engineer on National Highways Projects].</p>
Junior Structure / Bridge Engineer	<p>Education: Preferably M.Sc. (Structural Engineering) and minimum B.Sc. (Civil Engineering)</p> <p>Experience: Preferably ten (10) years relevant experience [proven seven (07) years' design experience as Junior Structure/ Bridge Engineer on National Highways Projects].</p>
Junior Highway Engineer	<p>Education: Preferably M.Sc. (Transportation Engineering) and minimum B.Sc. (Civil Engineering).</p> <p>Experience: Preferably ten (10) years relevant experience [proven seven (07) years' design experience as Junior Highway Engineer on National Highways Projects].</p>
Pavement Design Engineer	<p>Education: Preferably M.Sc. (Transportation Engg.) and minimum B.Sc. (Civil Engineering).</p> <p>Experience: Preferably twenty (20) years' relevant experience [proven fifteen (15) years' design experience as Pavement Design Engineer on major Highway Projects].</p>



6.25. MODE OF PAYMENT:

Sr. No.	DESCRIPTION	Percentage of "A"
		("A" to be calculated by excluding PS and LS items hereunder)
STAGE-I		
1	Inception Report for Technical Feasibility	4%
2	Inception/ Outline Report for Commercial Feasibility	4%
3	Alignment Study Report along with KMZ/KML file	4%
	<i>Sub-Total (1)</i>	12%
STAGE-II		
4	Preliminary Topographic Survey Report along with Plans	LS
5	Traffic Survey Report	LS
6	Axle Load Survey Report	LS
7	Preliminary Hydrology & Hydraulic Study Report	LS
8	Preliminary Soil & Material Investigation Report	LS
9	Preliminary Design Drawings and Engineer's Estimate	4%
10	Preliminary Technical Feasibility Report	8%
11	Preliminary Commercial Feasibility Report	8%
	<i>Sub-Total (2)</i>	20%
STAGE-III		
12	Detailed Topographic Survey Report along with Plans	LS
13	Detailed Soil & Material Investigation Report	LS
14	Geotechnical Investigation Report	LS
15	Condition Survey Report	2%
16	Environmental Impact Assessment (EIA) Report	LS
17	Design Report	8%
18	Final Design Drawings	8%
19	Land Acquisition & Utilities Folders	4%
20	Road Safety Audit Reports	LS
21	Construction Machinery Report	2%
22	Engineer's Estimate	4%
23	Final Technical Feasibility Report	8%
24	Final Commercial Feasibility Report	8%
25	Ground Validation & Alignment Stakeout (if required)	4%
26	PC-I (Project Cost including Viability Gap Funding)	4%
27	PC-I (Land)	4%
28	RFP Document including Model Concession Agreement	12%
	<i>Sub-Total (3)</i>	68%
	<i>Sub-Total (1+2+3)</i>	100%
	TOTAL	100%



National Highway Authority



REQUEST FOR PROPOSAL

For

**Consultancy Services for
Feasibility (Technical + Commercial) Study
and Detailed Design for Construction of
Shahdara Flyover on N-5 on Build – Operate
– Transfer (BoT) basis under Public Private
Partnership (PPP) Modality**

Tender No. 6(510)

Pages-1 to 133

September, 2020

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**GOVERNMENT OF PAKISTAN
NATIONAL HIGHWAY AUTHORITY
27-Mauve Area, G-9/1,
Post Box No. 1205,
ISLAMABAD**

Dated the _____

Ref No. _____

LETTER OF INVITATION (LOI)

To,

All prospective consultants

Gentlemen!

We extend warm welcome to you and invite you for participating in this project. We hope that you will live up to your reputation and provide us accurate information so that the evaluation is carried out "just and transparent". Please understand that the contents of this RFP, where applicable, shall be deemed part of the contract agreement. An example to this affect can be the contents of your work plan and methodology which you shall be submitting in your technical proposal. Since that is the basis of the selection, therefore, it shall become part of the contract agreement subject to approval/revisions of the same by NHA during the negotiations. Similarly, all other services and the content contributing to services shall be deemed part of the contract agreement unless it is specified for any particular item up-front in your technical proposal which obviously will make your proposal a conditional proposal whereby, authorizing NHA to may or may not consider to evaluate your proposal. Please understand that if no such mention appears up-front (i.e. on front page of technical proposal) then it shall be deemed that the consultant is in 100% agreement to the above. You are also advised to kindly read the RFP thoroughly as it can drastically affect the price structure for various services which may not be appearing directly in the terms of reference. In the end, we appreciate your participation and hope that you will feed a good proposal to merit consideration by NHA.

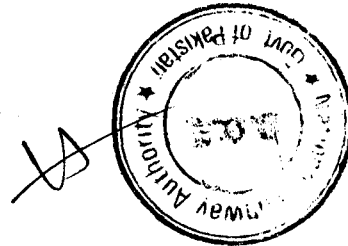
General Manager (P&CA)

Telephone: +92-51-9032727

Fax : +92-51-9260419

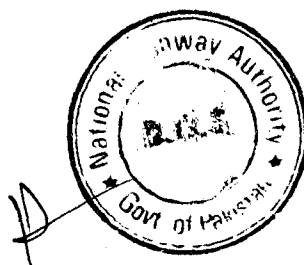
E-mail : gmpca.nha@gmail.com,

Website: www.nha.gov.pk



ATTACHMENTS

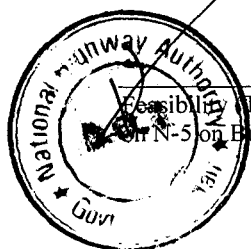
1. Instructions to Consultants
2. Data Sheet
3. Summary Evaluation Sheet
4. Personnel Evaluation Sheet
5. Technical Proposal Forms
6. Financial Proposal Forms
7. Appendix A (Terms of Reference)
8. Appendix B (List of Supporting Documents)
9. Appendix C (Person-Months and Activity Schedule)
10. Appendix D (Client's Requirements from the Consultants)
11. Appendix E (Personnel, Equipment, Facilities and other services to be provided by the Client).
12. Appendix F (Copy of Model Agreement)



INSTRUCTIONS TO CONSULTANTS

1. INTRODUCTION

- 1.1 You are hereby invited to submit a technical and a financial proposal for consulting services required for the assignment named in the attached Data Sheet (referred to as "Data Sheet" hereafter) annexed with this letter. Your proposal could form the basis for future negotiations and ultimately a Contract between your firm and the Client named in the Data Sheet.
- 1.2 A brief description of the assignment and its objectives are given in the Data Sheet. Details are provided in the attached RFP for design services provided in the Documents and will become part of agreement subsequently.
- 1.3 The assignment shall be implemented in accordance with the phasing specified in the Data Sheet.
- 1.4 The Client has been entrusted the duty to implement the Project as Executing Agency by Government of Pakistan (GoP) and funds for the project shall be arranged by the Client.
- 1.5 To obtain first-hand information on the assignment and on the local conditions, you are encouraged to pay a visit to the Client before submitting a proposal and attend a pre-proposal conference if specified in the Data Sheet. Your representative shall meet the named officials on the date and time specified in the Data Sheet. Please ensure that these officials are advised of the visit in advance to allow adequate time for them to make appropriate arrangements. You must fully inform yourself of local conditions and take them into account in preparing your proposal.
- 1.6 The Client shall provide the inputs specified in the Data Sheet, assist the Consultants in obtaining licenses and permits needed to carry out the services, and make available relevant project data and reports.
- 1.7 Please note that:
 - i. The cost of preparing the proposal and of negotiating the Contract, including a visit to the Client, are not reimbursable as a direct cost of the Assignment, and
 - ii. The Client is not bound to accept any of the proposals submitted.
- 1.8 The names of the invited consultants are given in the Data Sheet.
- 1.9 We wish to remind you that in order to avoid conflicts of interest:
 - a) Any firm providing goods, works, or services with which you are affiliated or associated is not eligible to participate in bidding for any goods, works, or services (other than the services and any continuation thereof) resulting from or associates' with the project of which this assignment forms a part; and
 - b) Any previous or ongoing participation in relation with the project by your firm, its professional staff, its affiliates or associates under a Contract may result in rejection of



your proposal. You should clarify your situation in that respect with the Client before preparing the proposal.

- 1.10 A firm may submit its proposal for the Assignment either as an independent Consultant or as a Member of a JV Consultants but participation of a firm occurring in more than one proposal for the Assignment is not allowed. In case a firm participates in more than one proposal, all such proposals shall be **disqualified and rejected**. However this condition does not apply for individual Specialist Sub-consultant(s).

2. DOCUMENTS

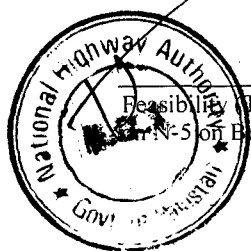
- 2.1 To prepare a proposal, please use the Documents specified in the Data Sheet.
- 2.2 Consultants requiring a clarification of the Documents must notify the Client, in writing, not later than twenty-one (21) days before the proposal submission date. Any request for clarification in writing, or by cable, telex or tele-fax shall be sent to the Client's address specified in the Data Sheet. The Client shall respond by cable, telex or tele-fax to such requests and copies of the response shall be sent to all invited Consultants.
- 2.3 At any time before the submission of proposals, the Client may, for any reason, whether at its own initiative or in response to a clarification requested by an invited consulting firm, modify the Documents by amendment. The amendment shall be sent in writing or by cable, telex or tele-fax to all invited consulting firms and will be binding on them. The Client may at its discretion extend the deadlines for the submission of proposals.

3. PREPARATION OF PROPOSAL

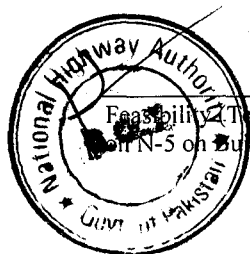
It will consist of two parts – Technical and Financial

3.1 Technical Proposal

- 3.1.1 The Technical Proposal should be submitted using the format specified and shall include duly signed and stamped forms appended with the RFP. This is a mandatory requirement for evaluation of proposals and needs to be filled up carefully.
- 3.1.2 For Technical Proposal, the general approach and methodology which you propose for carrying out the services covered in the TOR, including such detailed information as you deem relevant, together with your appreciation of the Project from provided details and
- (a) A detailed overall work program to be provided with timing of the assignment of each expert or other staff member assigned to the project. This will also provide the Client an opportunity to effectively monitor work progress.
 - (b) Total number of man-months and project duration as per TOR.
 - (c) Clear description of the responsibilities of each expert staff member within the overall work program.
 - (d) The Curriculum Vitae (CV) of all Key Staff members and an affidavit that proposed staff shall be available for the assignment during the project duration and their present place of duty must also be specified. The Consultants are advised to suggest such names that shall be available for the Assignment.



- (e) The technical proposal shall include duly filled in forms provided with this RFP. The name, background, and professional experience of each expert staff member to be assigned to the project, with particular reference to his experience of work of a nature similar to that of the proposed assignment.
 - (f) Current commitments and past performance are the basic criteria of technical proposal. You are required to provide the details of present commitments/on- going jobs as referred in the Form A-10 of technical proposal. Further, the basis for the past performance is the report from Design Section and Construction Wing of the Client.
- 3.1.3 In preparing the technical proposal, you are expected to examine all terms and instructions included in the Documents. Failure to provide all requested information shall be at your own risk and may result adversely in the scoring of your proposal. The proposal should be prepared as per RFP and any suggestion or review of staff etc. should be clearly spelt out in form A-4. This will be discussed at the time of negotiation meeting as and when called.
- 3.1.4 During preparation of the technical proposal, you must give particular attention to the following:
- a. The Firm needs to be registered with Pakistan Engineering Council (PEC).
 - b. If you consider that your firm does not have all the expertise for the assignment you may obtain a full range of experience by associating with other firms or entities. You may also utilize the services of expatriate experts but only to the extent for which the requisite expertise is not available in any Pakistani firm. In case of Joint Venture, the proposal should state clearly partners will be "Jointly and Severally" responsible for performance under the Contract and one (Representative) partner will be responsible for all dealings with the Client on behalf of the Joint Venture. Its "Power of Attorney" on this account is to be enclosed. The representative partner shall retain the responsibility for the performance of obligations and satisfactory completion of the consultancy services. PEC registers a foreign consulting firm for issuing license to provide consultancy services in Pakistan, which is based on formation of JV with the condition that the foreign consulting firm shall provide only that share of consultancy services by the JV for which expertise is not available with Pakistani consulting firms. A copy of JV agreement to be provided at the time of finalizing the contract documents with specific responsibilities and assignments to be looked after by each partner.
 - c. Subcontracting part of the assignment to the other Consultants is not discouraged and Specialist Sub-Consultants may be included.
 - d. The key professional staff proposed shall be permanent employees of the firm unless otherwise specified in the Data Sheet. The minimum stay with the firm for such persons is Six months. No alternative to key professional staff may be proposed and only one CV may be submitted for each position. The minimum required experience of proposed Key Staff is specified in the Data Sheet.
 - e. The training shall be imparted during the currency of the contract if specified in the Data Sheet.



3.1.5 The technical proposal shall not include any financial information. The Consultant's comments, if any, on the data, services and facilities to be provided by the Client and specified in the TOR shall be included in the technical proposal.

3.2 Financial Proposal

3.2.1 The financial proposal should be submitted using the format specified and enclosed with this RFP. This is a mandatory requirement for evaluation of proposals and needs to be filled up carefully. The total cost is to be specified in the Form A-17 and accordingly also in Form A-11.

3.2.2 The financial proposal should list the costs associated with the Assignment. These normally cover remuneration for staff in the field and at headquarters, per diem, housing, transportation for mobilization and demobilization, services and equipment (vehicles, office equipment furniture and supplies), printing of documents, surveys and investigations. These costs should be broken into foreign (if applicable) and local costs. Your financial proposal should be prepared using the formats attached as forms A-11 to A-17.

3.2.3 The financial proposal shall also take into account the professional liability as provided under the relevant PEC Byelaws and cost of insurances specified in the Data Sheet.

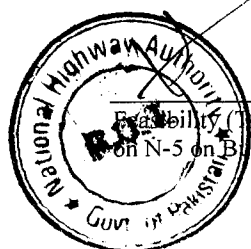
3.2.4 Costs may be expressed in currency (s) listed in the Data Sheet.

3.2.5 The evaluation committee will correct any computational errors. When correcting computational errors, in case of discrepancy between a partial amount and the total amount, or between word and figures the formers will prevail. In addition to the above corrections, activities and items described in the Technical Proposals but not priced, in the Financial Proposals shall be assumed to be included in the prices of other activities or items. In case an activity or item is quantified in the Financial Proposal differently from the Technical Proposal, the evaluation committee shall correct the quantification specified in the Financial Proposal so as to make it consistent with that specified in the Technical Proposal.

4. SUBMISSION OF PROPOSALS

4.1 You shall submit one original technical proposal and one original financial proposal and the number of copies of each specified in the Data Sheet. Each proposal shall be in a separate envelope indicating original or copy, as appropriate. All technical proposals shall be placed in an envelope clearly marked "Technical Proposal" and the financial proposals in the one marked "Financial Proposal". These two envelopes, in turn, shall be sealed in an outer envelope bearing the address and information specified in the Data Sheet. The envelope shall be clearly marked, "DO NOT OPEN, EXCEPT IN PRESENCE OF THE EVALUATION COMMITTEE."

4.2 In the event of any discrepancy between the copies of the proposal, the original shall govern. The original and each copy of the technical and financial proposals shall be prepared in indelible ink and shall be signed by the authorized Consultant's representative. The representative's authorization shall be confirmed by a written power of attorney accompanying the proposals. All pages of the technical and financial proposals shall be initialed by the person or persons signing the proposal.



- 4.3 The proposal shall contain no interlineations or overwriting except as necessary to correct errors made by the Consultants themselves. Any such corrections shall be initialed by the person or persons signing the proposal.
- 4.4 The completed technical and financial proposals shall be delivered on or before the time, date, and the location specified in the Data Sheet.
- 4.5 The proposals shall be valid for the number of days stated in the Data Sheet from the date of its submission. During this period, you shall keep available the professional staff proposed for the assignment. The Client shall make its best effort to complete negotiations at the location stated in the Data Sheet within this period.

5. PROPOSAL EVALUATION

- 5.1 A Single-Stage-Two-Envelope procedures shall be adopted in ranking of the proposals. The technical evaluation shall be carried out first, followed by the financial evaluation. The Consultants shall be ranked using a combined technical/financial score.

5.2 Technical Proposal

- 5.2.1 The evaluation committee appointed by the Client shall carry out its evaluation for all the projects as listed in Para 1.1, applying the evaluation criteria and point system specified in the Data Sheet. Each responsive proposal shall be given a technical score: S_t . The Consultants scoring less than seventy (70) percent points shall be rejected and their financial proposals returned un-opened.

5.3 Financial Proposal

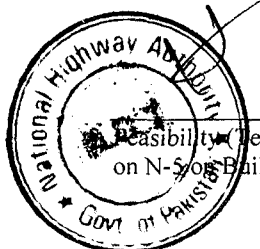
- 5.3.1 The financial proposals of the three top-ranking qualifying Consultants on the basis of evaluation of technical proposals shall be opened in the presence of the representatives of these Consultants, who shall be invited for the occasion and who care to attend. The Client shall inform the date, time and address for opening of financial proposals as specified in the Data Sheet. The total cost and major components of each proposal shall be publicly announced to the attending representatives of the firms.
- 5.3.2 The evaluation committee shall determine whether the financial proposals are complete and without computational errors. The lowest financial proposal (F_m) among all shall be given a financial score: S_f of 1000 points. The financial scores of the proposals shall be computed as follows:

$$S_f = (1000 \times F_m) / F$$

(F = amount of specific financial proposal)

- 5.3.3 Proposals, in the Quality Cum Cost Based Selection (QCBS) shall finally be ranked according to their combined technical (S_t) and financial (S_f) scores using the weights (T- the weight given to the technical proposal, P = the weight given to the financial proposal, and $T+P=1$) stated in the Data Sheet:

$$S = S_t \times T \% + S_f \times P \%$$



6. NEGOTIATION

- 6.1 Prior to the expiration of proposal validity, the Client shall notify the successful Consultant who submitted the highest-ranking proposal in writing, by registered letter, cable telex or facsimile and invite it to negotiate the Contract.
- 6.2 Negotiations normally take from two to five days. The aim is to reach agreement on all points and initial a draft contract by the conclusion of negotiations.
- 6.3 Negotiations shall commence with a discussion of your technical proposal. The proposed methodology, work plan, staffing and any suggestions you may have made to improve the TOR. Agreement shall then be reached on the final TOR, the staffing, and the bar charts, which shall indicate activities, staff, and periods in the field and in the home office, staff months, logistics and reporting.
- 6.4 Changes agreed upon shall then be reflected in the financial proposal, using proposed unit rates (no negotiation of the staff month rates).
- 6.5 Having selected Consultants on the basis of, among other things, an evaluation of proposed key professional staff, the Client expects to negotiate a contract on the basis of the staff named in the proposal. Prior to contract negotiations, the Client shall require assurances that the staff members will be actually available. The Client shall not consider substitutions of key staff except in cases of un-expected delays in the starting date or incapacity of key professional staff for reasons of health.
- 6.6 The negotiations shall be concluded with a review of the draft form of the contract. The Client and the Consultants shall finalize the contract to conclude negotiations. If negotiations fail, the Client shall invite the Consultants that received the second highest score in ranking to Contract negotiations. The procedure will continue with the third in case the negotiation process is not successful with the second ranked consultants.

7. AWARD OF CONTRACT

- 7.1 The contract shall be awarded after successful negotiations with the selected Consultants and approved by the competent authority. Upon successful completion of negotiations/initialing of the draft contract, the Client shall promptly inform the other Consultants that their proposals have not been selected.
- 7.2 The selected Consultant is expected to commence the assignment on the date and at the location specified in the Data Sheet.

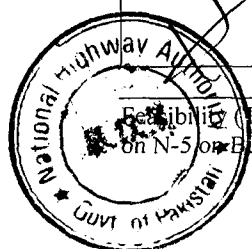
8. CONFIRMATION OF RECEIPT

- 8.1 Please inform the Client by telex/facsimile courier or any other means:
- (i) That you received the letter of invitation;
 - (ii) Whether you will submit a proposal; and
 - (iii) If you plan to submit a proposal, when and how you will transmit it.

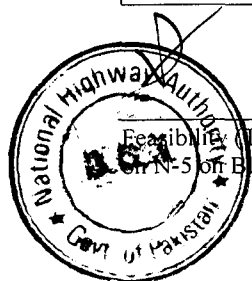


DATA SHEET

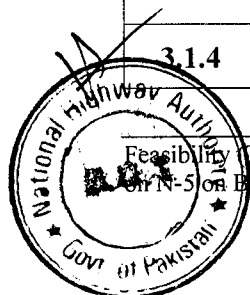
LOI Clause No.	DESCRIPTION OF CLAUSE
1.1	<p>The name of Assignment is: “Consultancy Services for Feasibility (Technical + Commercial) Study and Detailed Design for Construction of Shahdara Flyover on N-5 on Build – Operate – Transfer (BoT) basis under Public Private Partnership (PPP) Modality”</p> <p>The Client’s Name is: National Highway Authority</p>
1.2	<p>The description and the objectives of the assignment are: As per TOR</p>
1.3	<p>Phasing of the Assignment (if any): Nil</p> <p>The Consultant shall commence the assignment upon signing of Contract Agreement between NHA and the successful Consultant.</p>
1.5	<p>Pre-Proposal Conference: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>The name(s) and address(es) of the Official(s) is (are):</p> <p>General Manager (P&CA) National Highway Authority 28, Mauve Area, G-9/1 Islamabad</p> <p>Date, Time and Venue for Pre-Proposal Conference:</p> <p>Date: 15th September 2020 Time: 1100 hours Venue: NHA Auditorium (HQ) National Highway Authority 28, Mauve Area, G-9/1 Islamabad.</p>
1.6	<p>The Client shall provide the following inputs:</p> <p>As per TOR and Appendix D.</p>
1.7	<p>Following sub-clauses are added:</p> <p>iii. The Consultant may please note not to suggest names of key staff already proposed in other proposals with the Client or awarded recently. This will affect adversely marking of these professionals in evaluation of the technical proposal. Their secured points are liable to be reduced by 50% if their name appears in more than 1 previous proposal in which they are ranked No.1. Also, the existing load of work with a firm shall be considered as one of the factors for the consideration in the award of the work.</p>



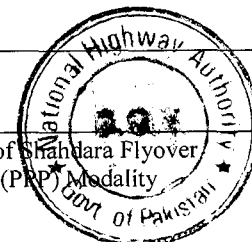
	<p>iv. Form A-4 is meant for comments on provision contained in RFP and Terms of Reference (TOR) and unless the observations are noted in this particular form, anything written elsewhere on this account including financial implications, if any, shall be considered of no consequence in the evaluation process.</p> <p>v. Consultants may form a Joint Venture (JV) to qualify for the Assignment in which case the contract will be signed between the Client and all members of the JV on the prescribed Form included in Appendix E (copy of Model Agreement) subject to the ranking and successful negotiations. A JV may include at the most four members. To promote the consultancy industry in the country, 50 marks (out of 1000 for Evaluation) are allocated for Transfer of Knowledge in the form of JV with a new / less experienced firm by sharing at least 20% of Assignment with them.</p>
1.8	<p>The Invited Consultants / Eligible Consultants are: <u>Any firm meeting the following requirements:</u></p> <p>(a) Valid Registration Certificate of Pakistan Engineering Council with relevant Project Profile Codes. Foreign consulting firms shall make JV in accordance with Byelaw 6(2) and Byelaw 9 of the Pakistan Engineering Council (Conduct and Practice of Consulting Engineers) Bye-Laws 1986. Failure to provide valid Registration Certificate (license) of the firm (each member in case of JV) by the PEC will entitle the Client to <u>reject the proposal</u>.</p> <p>(b) In case of JV members, Letter of Intent to form on firm's letter head (<i>original is required, scanned copy is not acceptable</i>). <i>The specimen is attached at <u>Annexure-A</u></i></p> <p>(c) TECHNICAL PROPOSAL FORMS A-1 to A-10 duly completed as per Instructions to Consultants/ Data Sheet and requirements of TOR (To be attached with Technical Proposal <i>except Form A-4, which can be submitted with or without comments</i>)</p> <p>(d) At the time of proposal submission/ opening, page numbering, signing and stamping of proposals will be checked by Committee Members. If any minor discrepancy is found then same shall be asked by the Committee members to the Authorized Representative of firms to correct it in front of all committee members. In the absence of authorized representative, the concerned firm will be announced dis-qualified.</p> <p>(e) Lists of facilities available with the Consultant to perform their functions effectively (software, hardware, etc.). In case of JV, the same will be provided by the lead firm only.</p> <p>(f) FINANCIAL PROPOSAL FORMS A-11 to A-17 duly completed as per Instructions to Consultants/ Data Sheet and requirements of TOR (To be attached with Financial Proposal).</p> <p>(g) Audit Reports of the firm (s) for last three years duly certified by Chartered Accountant (To be attached with Financial Proposal).</p>



2.1	<p>The Documents are:</p> <ul style="list-style-type: none"> (a) Letter of Invitation (LOI). (b) Instructions to Consultants (ITC). (c) Data Sheet. (d) Technical Proposal Forms. (e) Financial Proposal Forms (f) Appendix – A: TOR and Background Information. (g) Appendix – B: List of Supporting Documents (h) Appendix – C: Man-Months and Activity Schedule (i) Appendix – D: Client’s Requirements from the Consultant. (j) Appendix – E: Personnel Equipment, Facilities and Other Services to be provided by the Client. (k) Appendix – F: Copy of Model Agreement/ Draft Form of Contract & Appendices etc. (l) Form of Contract (<i>For Consultants to perform services as a Joint Venture</i>)
2.2	<p>The words “Twenty-one (21)” is deleted in its entirety and replaced with “Five (05)”. The information will be shared through email or courier.</p> <p>The address for seeking clarification is:</p> <p>General Manager (P&CA) National Highway Authority 28, Mauve Area, G-9/1, Islamabad E-mail: gmpca.nha@gmail.com</p>
2.3	<p>Add following clause:</p> <p>“The information will be shared through email or courier”.</p>
3.1.1	<p>Add following:</p> <p>The proposals should be bound in the hard book binding form to deny the possibility of removal or addition of page(s). All the pages of proposal must be signed and stamped in original by authorized representative of the firm/JV. All the pages must be numbered starting from first page to last. At the time of proposal submission/ opening, page numbering, signing and stamping of proposals will be checked by Committee Members, if any minor discrepancy will be found then same shall be asked by the Committee members to the Authorized Representative of firms to correct it in front of all committee members. In the absence of authorized representative, the concerned firm(s) will be announced <u>dis-qualified</u>.</p>
3.1.4	<p>c. The term associates, if used in the proposal or otherwise shall not be considered as</p>



<p>an alternative of JV member. <u>Any personnel proposed for the Assignment but belonging to the so called associates shall not be marked in evaluation of technical proposal</u> like in case of Sub-consultants (except individual Specialist Sub-consultants having unique expertise which is rarely available OR an expatriate Personnel) who are not supposed to contribute in qualification of their main consultants.</p> <p>d. Proposed key staff shall preferably be permanent employees who are employed with the consultants at least six months prior to submission of Proposal.</p> <p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>The minimum required experience of proposed Key Personnel is given below:</p>	
FOR KEY PERSONNEL	
Team Leader / Senior Structural Engineer	<p>Education: Preferably M.Sc. (Structural Engineering) and minimum B.Sc. (Civil Engineering).</p> <p>Experience: Preferably twenty (20) years relevant experience [proven fifteen (15) years' design experience as Team Leader/ Sr. Structural Engineer on National Highways Projects];</p> <p>He/ she must also have performed as Team Leader for at least three (03) major Highway Design Projects.</p>
Senior Highway Engineer	<p>Education: Preferably M.Sc. (Transportation Engineering) and minimum B.Sc. (Civil Engineering).</p> <p>Experience: Preferably twenty (20) years' relevant experience [proven fifteen (15) years' design experience as Senior Highway Engineer on National Highways Projects].</p>
Junior Structure / Bridge Engineer	<p>Education: Preferably M.Sc. (Structural Engineering) and minimum B.Sc. (Civil Engineering)</p> <p>Experience: Preferably twelve (12) years relevant experience [proven ten (10) years' design experience as Junior Structure/ Bridge Engineer on National Highways Projects].</p>
Junior Highway Engineer	<p>Education: Preferably M.Sc. (Transportation Engineering) and minimum B.Sc. (Civil Engineering).</p> <p>Experience: Preferably twelve (12) years relevant experience [proven ten (10) years' design experience as Junior Highway Engineer on National Highways Projects].</p>
Pavement Design Engineer	<p>Education: Preferably M.Sc. (Transportation Engg.) and minimum B.Sc. (Civil Engineering).</p> <p>Experience: Preferably twenty (20) years' relevant experience [proven fifteen (15) years' design experience as Pavement Design Engineer on major Highway Projects].</p>



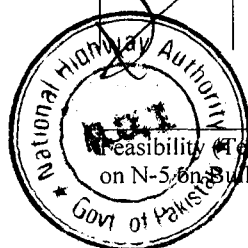
Transport Economist	<p>Education: Preferably M.Sc. (Economics with specialization in Transportation) and minimum B.Sc. (Transportation Engineering)</p> <p>Experience: Preferably twenty (20) years' relevant experience [proven fifteen (15) years' experience as Transport Economist in highway sector].</p>
PPP Expert/ Financial Expert	<p>Education: Preferably Certificate of Chartered Accountancy/ Certified Financial Analyst/ ACCA and minimum M.Sc. Economics/ MBA (Finance)/ ICMA or equivalent</p> <p>Experience: Preferably twenty (20) years' relevant experience [proven fifteen (15) years' experience as PPP Expert/ Financial Expert on mega infrastructure projects preferably Highway Projects].</p>
Corporate Law Expert	<p>Education: Preferably Masters of Law (LLM)/ Masters of Law (Corporate Law) and minimum Bachelors of Law (LLB).</p> <p>Experience: Preferably twenty (20) years' relevant experience [proven fifteen (15) years' experience as Corporate Law Expert on mega infrastructure projects preferably Highway Projects].</p>
<p>Note: The Consultants are advised to submit updated CV's strictly in compliance with the format of CVs given in Technical Proposal Form A-5. CVs submitted without regard to the said format may score low.</p>	
<p>e. Training is an important feature of this Assignment:</p> <p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>If Yes, details of training are given in TOR</p>	
3.2.3	<p>Professional liability, insurances (description or reference to appropriate documentation):</p> <p>i. The Consultants shall be responsible for Professional Indemnity Bond of the required amount at their own cost. This bond shall be in the joint name of Consultant and the Client.</p> <p>ii. The Consultants are required to insure their Employees and Professionals for Hospitalization/ Medical, Travel and Accident Cover for the duration of the Contract. The details provided in Para 3.5 of Special Conditions of Contract in Model Contract.</p>
4.1	<p>The number of copies of the Proposal required is:</p> <p>Technical Proposal: One Original and Four copies with CD (soft form of complete Technical Proposal in PDF Form) in sealed envelope.</p> <p>Financial Proposal: One Original with CD (soft form of complete Financial Proposal in PDF as well as MS Word/Excel</p>



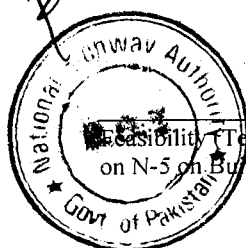
	Forms) in sealed envelope. The address for writing on the proposal is: General Manager (P&CA) National Highway Authority 28, Mauve Area G-9/1 Islamabad Telephone: +92-51-9032727 Facsimile: +92-51-9260419																																																
4.4	The date and time of proposal submission is: Date: 1st October, 2020 Time: 1130 hours Location of Submission: NHA Main Auditorium National Highway Authority 27-Mauve Area G-9/1 Islamabad.																																																
4.5	Validity period of the proposal is: 180 days The bid shall remain valid up to 30th March, 2021 The location for negotiation of proposal is: General Manager (P&CA) National Highway Authority 28-Mauve Area G-9/1 Islamabad Telephone: +92-51-9032727 Facsimile: +92-51-9260419																																																
5.2	The evaluation of technical proposal shall be based on following criteria: <table border="1"> <thead> <tr> <th>Sr. No.</th> <th>Description / Items</th> <th>Points</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Experience of the Firm</td> <td>100</td> </tr> <tr> <td></td> <td>1-a) General Experience in road Transport Sector</td> <td><u>(25)</u></td> </tr> <tr> <td></td> <td>1-b) Specific Experience related to particular Assignment*</td> <td><u>(75)</u></td> </tr> <tr> <td>2.</td> <td>Approach & Methodology</td> <td>250</td> </tr> <tr> <td></td> <td>2-a Appreciation of the Project</td> <td><u>(70)</u></td> </tr> <tr> <td></td> <td>(i). <i>Understanding of the Assignment</i></td> <td><u>(30)</u></td> </tr> <tr> <td></td> <td>(ii). <i>Clarity of appreciation</i></td> <td><u>(20)</u></td> </tr> <tr> <td></td> <td>(iii). <i>Comprehensiveness of appreciation</i></td> <td><u>(20)</u></td> </tr> <tr> <td></td> <td>2-b Problem Statement/ Understanding of Objectives</td> <td><u>(50)</u></td> </tr> <tr> <td></td> <td>(i). <i>Identification of Problems/ Objectives</i></td> <td><u>(30)</u></td> </tr> <tr> <td></td> <td>(ii). <i>Components of Proposed Services</i></td> <td><u>(20)</u></td> </tr> <tr> <td></td> <td>2-c Methodology</td> <td><u>(80)</u></td> </tr> <tr> <td></td> <td>(i). <i>Proposed Solutions for this Project</i></td> <td><u>(30)</u></td> </tr> <tr> <td></td> <td>(ii). <i>Quality of Methodology</i></td> <td><u>(20)</u></td> </tr> <tr> <td></td> <td>(iii). <i>Conciseness, clarity and completeness of proposal**</i></td> <td><u>(30)</u></td> </tr> </tbody> </table>	Sr. No.	Description / Items	Points	1.	Experience of the Firm	100		1-a) General Experience in road Transport Sector	<u>(25)</u>		1-b) Specific Experience related to particular Assignment*	<u>(75)</u>	2.	Approach & Methodology	250		2-a Appreciation of the Project	<u>(70)</u>		(i). <i>Understanding of the Assignment</i>	<u>(30)</u>		(ii). <i>Clarity of appreciation</i>	<u>(20)</u>		(iii). <i>Comprehensiveness of appreciation</i>	<u>(20)</u>		2-b Problem Statement/ Understanding of Objectives	<u>(50)</u>		(i). <i>Identification of Problems/ Objectives</i>	<u>(30)</u>		(ii). <i>Components of Proposed Services</i>	<u>(20)</u>		2-c Methodology	<u>(80)</u>		(i). <i>Proposed Solutions for this Project</i>	<u>(30)</u>		(ii). <i>Quality of Methodology</i>	<u>(20)</u>		(iii). <i>Conciseness, clarity and completeness of proposal**</i>	<u>(30)</u>
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2-d	Suggested changes for improvement in TOR	(10)
2-e	Work Program	(20)
2-f	Staffing Schedule	(20)
3.	Key Staff***	450
4.	Performance Certification from clients****	100
5.	Present Commitments (current engagement and available strength – justification)	50
6.	Transfer of Knowledge (Methodology/ Plans) *****	50
	Total Points:	1000
	Minimum qualifying technical score:	700
	<p>* Performance Certificate/ Assignment Completion Certificate (All completed projects mentioned under TECHNICAL PROPOSAL FORM-A2 CONSULTANT'S EXPERIENCE/ CLIENT'S REFERENCE).</p> <p>Note: Any project mentioned completed under Form A-2 (Part-B) will not be considered for evaluation unless Performance Certificate/ Assignment Completion Certificate with satisfactory remarks by the client's representative is not attached. The Client NHA reserves the right to verify the Performance/ Assignment Completion Certificates.</p> <p>** Conciseness and clarity contains 10 marks and 20 marks will be for the completeness of the proposals which includes but not limited to hard binding, sequential page numbering, signing and stamping of each page of proposal.</p> <p><i>(At the time of proposal submission/ opening, page numbering, signing and stamping of proposals will be checked by Committee Members, if any minor discrepancy will be found then same shall be asked by the Committee members to the Authorized Representative of firms to correct it in front of all committee members. In the absence of authorized representative, the concerned firm(s) will be announced dis-qualified.)</i></p> <p>*** Firm affidavit for presence of personnel carries 25 marks out of 450 marks (complete in all respect as per specimen annexed at Annex-C placed in Technical Proposal Forms).</p> <p>**** 25 out of 100 marks will be allocated for provision of affidavit on stamp paper duly attested by the Oath Commissioner to the effect that the firm has neither been blacklisted nor any contract rescinded in the past for non-fulfillment of contractual obligations (complete in all respect as per specimen annexed at Annex-B placed in Technical Proposal Forms).</p> <p>***** Transfer of knowledge would be in the form of joint venture with new/ less experienced firm(s) by sharing at least 20% of Assignment with them for promoting the consultancy industry in the country. <i>Criteria for New firm are the one which has carried out maximum 3 projects in 6 years.</i></p>	

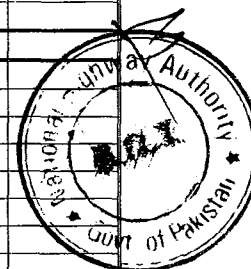


	The points earmarked for evaluation sub-criteria (3) for suitability of Key Staff are:	
	Sr. No.	Description / Items
	i.	Academic and General Qualifications
	ii.	Professional experience related to the Project
	iii.	Status with the firm (Permanent & duration with Firm as per LOI Clause 3.1.4 (d))
		Total Points:
		100
5.3.1	Following is added: The words “three top-ranking qualifying consulting firms” is deleted in its entirety and replaced with the words “qualifying consultants” The date, time, and address of the financial proposal opening shall be informed after evaluation and approval of technical proposals, accordingly.	
5.3.3	The weights given to the Technical and Financial Proposals are: Technical (T%): 80% Financial (P%): 20%	
6.3	Add following at the end of this Para: The final person-months of each expert, if required, are subject to adjustment at the stage of contract negotiation in line with demonstrated approaches methodology and need basis.	
7.2	The assignment is expected to commence in: November 2020	
8	The Clause is deleted in its entirety	



SUMMARY EVALUATION SHEET FOR FULL TECHNICAL PROPOSALS (QCBS)

EVALUATION CRITERIA	Max. Weightage	Firm 1		Firm 2	
		Rating	Score	Rating	Score
1. Firms Experience	100				
General Experience in road Transport Sector	25				
Specific Experience related to particular Assignment	75				
2. Approach and Methodology	250				
2-a. <u>Appreciation of the Project</u>	70				
(i) Understanding of the Assignment	(30)				
(ii) Clarity of appreciation	(20)				
(iii) Comprehensiveness of appreciation	(20)				
2-b. <u>Problem Statement/ understanding of objectives</u>	50				
(i) Identification of Problems/ Objectives	(30)				
(ii) Components of Proposed Services	(20)				
2-c. <u>Methodology</u>	80				
(i) Proposed Solutions for this Project	(30)				
(ii) Quality of Methodology	(20)				
(iii) Conciseness, clarity and completeness of proposal*	(30)				
2-d. Suggested Changes for Improvement in TOR	10				
2-e. Work Program	20				
2-f. Staffing Schedule	20				
3. Key Personnel**	450				
(i) Team Leader/ Senior Structural Engineer	95				
(ii) Senior Highway Engineer	60				
(iii) Junior Structure/ Bridge Engineer-I & II	2 x 35				
(iv) Junior Highway Engineer	35				
(v) Pavement Design Engineer	35				
(vi) Transport Economist	35				
(vii) PPP Expert/ Financial Expert	60				
(viii) Corporate Law Expert	35				
4. Performance Certification from clients***	100				
5. Present Commitments (current engagement and available strength – justification)	50				
6. Transfer of Knowledge (Methodology/ Plans)****	50				
TOTAL:	1000				



Excellent - 100% Very Good - 90-99% Above Average – 80-89% Average – 70-79% Below Average – 1-69% Non-complying – 0%

Score: Maximum Weightage x rating / 100. Minimum qualifying score is 70% or 700 marks.

*Conciseness and clarity contains 10 marks and 20 marks will be for the completeness of the proposals which includes but not limited to hard binding, sequential page numbering, signing and stamping of each page of proposal.

**Firm affidavit for presence of personnel carries 25 marks out of 450 marks (complete in all respect as per specimen annexed at Annex-C placed in Technical Proposal Forms).

***25 out of 100 marks will be allocated for provision of affidavit on stamp paper duly attested by the Oath Commissioner to the effect that the firm has neither been blacklisted nor any contract rescinded in the past for non-fulfillment of contractual obligations (complete in all respect as per specimen annexed at Annex-B placed in Technical Proposal Forms).

****Criteria for New firm is the one which has carried out maximum 3 projects in 6 years.

PERSONNEL EVALUATION SHEET

POSITION / AREA OF EXPERTISE	Name	Academic and General Qualification* Weightage 30%		Project related Experience Weightage 60%		Status with the Firm** 10%		OVERALL RATING (Sum of Weighted Ratings) (A+B+C)
		Percentage Rating	Weighted Rating (A)	Percentage Rating	Weighted Rating (B)	Percentage Rating	Weighted Rating (C)	
(Show all experts to be evaluated)								
(i) Team Leader/ Senior Structural Engineer								
(ii) Senior Highway Engineer								
(iii) Junior Structure/ Bridge Engineer-I & II								
(iv) Junior Highway Engineer								
(v) Pavement Design Engineer								
(vi) Transport Economist								
(vii) PPP Expert/ Financial Expert								
(viii) Corporate Law Expert								

Rating: - Excellent - 100% Very good – 90-99% Above Average – 80-89% Average – 70-79% Below Average – 1-69%
Non-complying - 0%

Score: Maximum Weightage X rating / 100.

* For Team Leader/ Senior Structural Engineer, Senior Highway Engineer, Junior Structure/ Bridge Engineer, Junior Highway Engineer, Pavement Design Engineer, Transport Economist: M.Sc. – 100%; B.Sc. – 70%.

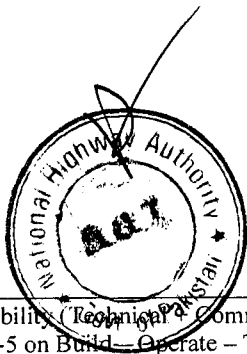
PPP Expert/ Financial Expert: Certificate of Chartered Accountancy/ Certified Financial Analyst/ ACCA – 100%; M.Sc. Economics/ MBA (Finance)/ ICMA or equivalent – 70%

Corporate Law Expert: Masters of Law (LLM)/ Masters of Law (Corporate Law) – 100%; Bachelors of Law (LLB) – 70%

** 6 month older employee - 100%;
 Less than 6 months or associates- 0%



TECHNICAL PROPOSAL FORMS



Technical Proposal – Forms

{Notes to Consultant shown in brackets throughout this Section provide guidance to the Consultant to prepare the Technical Proposal; they should not appear on the Proposals to be submitted.}

Checklist of Required Forms (subparagraph 3.1.3 of ITC)

Required, (√)	FORM	DESCRIPTION	Page Limit
√	A-1	Technical Proposal Submission Form	
√	A-1 Attachment	Proof of legal status and eligibility	
“√” If applicable	A-1 Attachment	If the Proposal is submitted by a joint venture, attach a letter of intent.	
“√” If applicable	A-1 Attachment Power of Attorney	Power of attorney for the authorized representative of the lead firm as per instructions given in specimen of letter of intent (Annexure-D).	
		Consultant’s Organization and Experience.	As given below
√	A-2	A. Consultant’s Organization	3
		B. Consultant’s Experience/ Client’s Reference	20
		C. Client’s Satisfaction Certificate alongwith details	10
√	A-3	Approach Paper on Methodology proposed for Performing the Assignment	50
		Comments/ Suggestions of Consultant	[See footnote] ¹
√	A-4	A. On the Terms of Reference	n/a
		B. On the Counterpart Staff and Facilities	2
√	A-5	Format of Curriculum Vitae (CV) for proposed Key Personnel	8 pages each CV
√	A-6	Completion and Submission of Reports as per TOR	n/a
√	A-7	Composition of the Team Personnel and the Tasks to be Assigned to each Team Member	n/a
√	A-8	Work Plan /Activity Schedule	n/a
√	A-9	Work Plan and Time Schedule for Key Personnel (<u>Man-months of staff and Project Duration as per TOR.</u>)	n/a
√	A-10	Current Commitments of the Firm	n/a

Note: Failure to provide required attachments with Form A-1 will entitle the Client to **reject the proposal**

¹ The total number of pages for combined forms A-3 and A-4 should not exceed 50. A page is defined as one printed side of A4 or letter-size paper with font size of 10 or more.

TECHNICAL PROPOSAL SUBMISSION FORM

(To be required from lead firm only)

{Location, Date}

To: [Name and address of Client]

Dear Sirs:

We, the undersigned, offer to provide the ... [NAME OF THE PROJECT]...in accordance with your Request for Proposals. We are hereby submitting our Proposal, which includes this Technical Proposal and a Financial Proposal sealed in a separate envelope.

(If the Consultant is a joint venture, insert the following):

We are submitting our Proposal in a joint venture with: (Insert a list with full name and the legal address of each member and indicate the lead member). We have attached a copy of our letter of intent to form a joint venture, which details the likely legal structure of and the confirmation of joint and severable liability of the members of the said joint venture.

OR

(If the Consultant's Proposal includes Sub-consultants, insert the following):

We are submitting our Proposal with the following firm(s) as Sub-consultants: (Insert a list with full name and country of each Sub-consultant.)

We hereby declare that:

- (a) All the information and statements made in this Proposal are true and we accept that any misinterpretation or misrepresentation contained in this Proposal may lead to our disqualification and/or imposition of any sanction by the client.
- (b) Our Proposal shall be valid and remain binding upon us for the period of time specified in the Data Sheet, Clause 4.5.
- (c) We have no conflict of interest in accordance with ITC Clause 1.9.
- (d) We meet the eligibility requirements as stated in Data Sheet Clause 1.8.
- (e) Neither we, nor our JV Partner(s)/sub-consultant(s) or any of the proposed experts prepared the TOR for this consulting assignment.
- (f) Within the time limit stated in the Data Sheet, Clause 4.5, we undertake to negotiate a Contract on the basis of the proposed Key Personnel. We accept that the substitution of Key Personnel for reasons other than those stated in ITC, Clause 6.5 may lead to the termination of Contract negotiations.
- (g) Our Proposal and any modifications resulting from the Contract negotiations is binding upon us.



(h). Our firm/ each member of our JV is not participating in any other proposal for this Project.

We undertake, if our Proposal is accepted and the Contract is signed, to initiate the Services related to the Project not later than the date mentioned in Data Sheet 4.5 (or the date extended with the written consent of Consultant in case of delay in procurement process)

We understand that the Client reserves the right to reject all proposals as per PPRA Rules.

We remain,

Yours sincerely,

Signature of Authorized Representative* of the Lead Firm:

{In full} _____ {and initial} _____

Name and Title of Signatory: _____

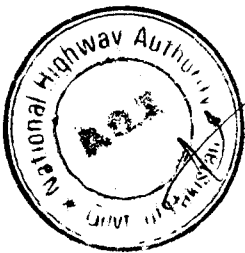
Name of Consultant (Firm's name or JV's name): _____

In the capacity of: _____

Address: _____

Contact information (phone and e-mail): _____

** The above signatory or his authorized representative should attend the proposal submission and opening with authority to sign and stamp any missing pages of proposal in line with instructions given in clause 1.8 of the Data Sheet. The specimen of authorization for submission is given at Annexure-D.*



CLIENT'S REFERENCE

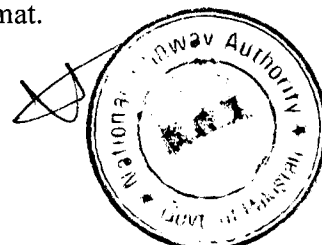
- A. Detail about consultant(s) Organization.
- Hierarchy/ organizational chart, Office address, Employees details, etc.,
- B. Relevant Services (as per RFP notice) Carried Out in the Last Ten Years Which Best Illustrate Qualifications
- General experience in road Transport Sector
 - Specific experience related to particular assignment should be given on following format:

Using in the format below, provide information on each reference assignment for which your firm, either individually as a corporate entity or as one of the major companies within a consortium, was largely contracted.

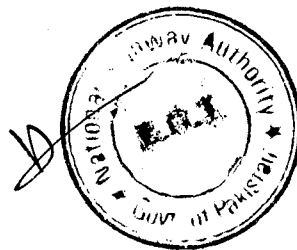
Assignment Name:		Country.	
Location within Country:		Professional Staff Provided by Your Firm:	
Name of Client:		No. of Staff:	
Address:		No. of Staff Months:	
Start Date (Month/Year):	Completion (Month/Year):	Date	Approx. Value of Services (in Current US\$/Rs.)
Name of Associated Firm (s), if any:		No. of Months of Professional Staff Provided by Associated Firm(s)	
Name of Senior Staff (Project Director/Coordinator, Team Leader) involved and functions performed:			
Narrative Description of Project			
Description of Actual Services Provided by Your Staff			

- C. The project details of Client's Satisfaction Certificates (Performance Reports) for the last 3 relevant assignments should also be given on above format.

Consultants' Name: _____



**APPROACH PAPER ON METHODOLOGY PROPOSED FOR PERFORMING THE
ASSIGNMENT**



Form A-4 (A and B)**COMMENTS/SUGGESTIONS OF CONSULTANT**

[Provide here comments and suggestions on the Terms of Reference that could improve the quality/ effectiveness of the Assignment; and on requirements for counterpart staff and facilities, which are provided by the Client, including: administrative support, office space, local transportation, equipment, data, etc., separately under Forms Form-4A and Form-4B respectively.]

A. On the Terms of Reference (TOR)

1.

2.

Etc.,

B. On the data, services and facilities to be provided by the Client specified in the TOR.

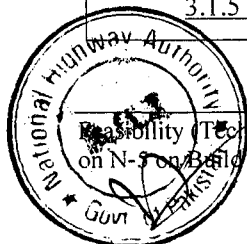
1.

2.

Etc.

Note:

1. The Consultant may propose a team of experts to best achieve the scope of service and activities and to deliver outputs as required in TOR. Proposed changes in position/individual inputs should be indicated and reasoned in the Technical Proposal but incorporated only in the Financial Proposals (showing excess/saving, in datum Price as worked out with the person months indicated in the RFP, which must be clearly bifurcated and marked red at each place for acceptance or otherwise by the Client at its prerogative during negotiations).
 - (i) The Proposal may assign person-month inputs differently from TOR. However, Key Personnel input totals in the Proposal should not be less than the minimum totals of person-months inputs mentioned in Data Sheet Sub-Clause-3.1.4 respectively.
 - (ii) The Proposal may include additional expert position/s. However, additional expert will be considered Non Key Personnel for the purpose of proposal evaluation.
 - (iii) If the Proposal drops or replaces a Key Personnel position with a different one, the original position will receive zero score in the technical evaluation and the new position added in the Proposal will be considered Non Key and will not be evaluated.
 - (iv) **DO NOT INCLUDE EXCESS/SAVING INFORMATION IN TECHNICAL PROPOSAL.** If Technical Proposal includes financial information, the Proposal will be rejected under Clause-3.1.5 of ITC.
2. When the Consultant suggests a change in scope of service, activities or output, the Consultant must describe the details in Form-4A and the change should not be incorporated in the Proposal. Enumerate each suggestion in Form-4A with incremental cost as a separate attachment to Financial Proposal indicating breakdown into individual remuneration and expenses for each suggestion. Forms A-11 to 17 should be prepared without incorporating the changes.
 - (i) If Financial Proposal provides no separate attachment about incremental cost to a suggestion, the suggestion will be considered at no additional cost to the Client and no negotiations for an incremental cost shall be done;
 - (ii) **DO NOT INCLUDE INCREMENTAL COST INFORMATION IN TECHNICAL PROPOSAL.** If Technical Proposal includes financial information, the Proposal will be rejected under Clause-3.1.5 of ITC.



FORMAT OF CURRICULUM VITAE (CV) FOR PROPOSED KEY STAFF

1. Proposed Position: _____
2. Name of Firm: _____
3. Name of Staff: _____
4. Profession: _____
5. Date of Birth: _____
6. Years with Firm: _____
7. Nationality: _____
8. N.I.C Number: _____
9. Cell Number: _____
10. Membership in Professional Societies: _____
(Membership Certificate of PEC/ relevant council is Mandatory for Engineers. Copy of online updated PEC/relevant council details, as per Membership Number will be attached)
11. Detailed Tasks Assigned on the Project: _____

◆ Key Qualifications:

[Give an outline of staff member's experience and training most pertinent to tasks on assignment. Describe degree of responsibility held by staff member on relevant previous assignments and give dates and locations. Use up to one page].

◆ Education

[Summarize college/university and other specialized education of staff member, giving names of institutions, dates attended and degrees obtained].

◆ Employment Record

[Starting with present position, list in reverse order every employment held. List all positions held by staff member since graduation, giving dates, names of employing organizations, title of positions held and location of assignments. For experience, also give types of activities performed and Client references, where appropriate].



◆ Languages

[Indicate proficiency in speaking, reading and writing of each language: excellent, good, fair, or poor].

◆ Certification

I, the undersigned, certify to the best of my knowledge and belief that

- (i) This CV correctly describes my qualifications and experience.
- (ii) I am not a current employee of the Executing or the Implementing Agency.
- (iii) In the absence of medical incapacity, I will undertake this assignment for the duration and in terms of the inputs specified for me in Form A-9 provided team mobilization takes place within the validity of this proposal.
- (iv) I was not part of the team who wrote the terms of reference for this consulting services assignment
- (v) I am not currently debarred by any department/organization/ (semi-autonomous/ autonomous) bodies or such like institutions in Pakistan.
- (vi) I certify that I have been informed by the firm that it is including my CV in the Proposal for the {name of project and contract}. I confirm that I will be available to carry out the assignment for which my CV has been submitted in accordance with the implementation arrangements and schedule set out in the Proposal.

If CV is signed by the firm's authorized representative:

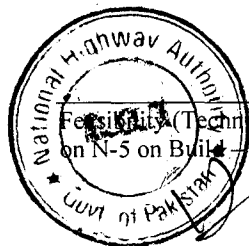
- (vii) I, as the authorized representative of the firm submitting this Proposal for the {name of project and contract}, certify that I have obtained the consent of the named expert to submit his/her CV, and that s/he will be available to carry out the assignment in accordance with the implementation arrangements and schedule set out in the Proposal, and confirm his/her compliance with paras (i) to (v) above.
- (viii) Latest colored attested photograph stapled attached with the CV.

I understand that any willful misstatement described herein may lead to my disqualification or dismissal, if engaged.

Signature of authorized representative of the
Lead firm

Date: _____
Day/Month/Year

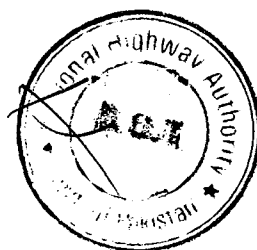
Note: copy or scanned signatures are not allowed



Feasibility (Technical + Commercial) Study and Detailed Design for Construction of Shahdara Flyover on N-5 on Build - Operate - Transfer (BoT) basis under Public Private Partnership (PPP) Modality

COMPLETION AND SUBMISSION OF REPORTS AS PER TOR

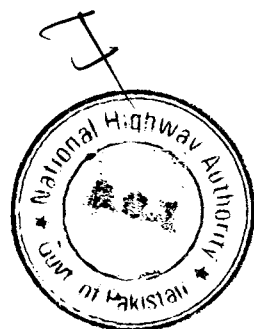
	Reports	Date
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		



COMPOSITION OF THE TEAM PERSONNEL AND THE TASKS TO BE ASSIGNED TO EACH TEAM MEMBER

1. Technical/Managerial Staff

NAME	POSITION	Tasks Assignment	Present location	Name of assignment involved and clients name



WORK PLAN /ACTIVITY SCHEDULE

Items of Work/Activities	Monthly Program from date of assignment (in the form of a Bar Chart)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15



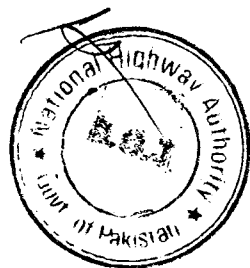
WORK PLAN AND TIME SCHEDULE FOR KEY PERSONNEL

Name	Position	Months (in the form of a Bar Chart)															Number of Months	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		

Full Time: _____
 Part Time: _____

Activities Duration _____

Yours faithfully,



Signature _____
 (Authorized Representative)

Full Name _____
 Designation _____
 Address _____

CURRENT COMMITMENTS OF THE FIRM

(List MUST be comprehensive including projects from clients other than NHA as well)

Name of project	Single or JV	Task Assignment	Start date of the project	Expected date of completion



Annex-A

Specimen
(On Lead Firm's letterhead)

LETTER OF INTENTION

Subject: Technical and Financial Proposals For Consultancy Services for (Name of Project)

This Joint Venture (JV) is made among following parties;

- 1) M/s _____ as Lead Firm having ____% share.
- 2) M/s _____ as JV Partner having ____% share.
- 3) M/s _____ as JV Partner having ____% share.
- 4) M/s _____ as JV Partner having ____% share.

The above firms are jointly and severally liable to the Client for preparation of Technical and Financial Proposals for Consultancy Services for "[NAME OF THE PROJECT]" (hereinafter called "The Project").

The Firm hereto confirm the understanding as follows:

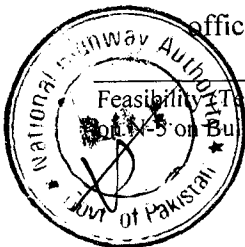
1. Objective

It is hereby agreed to form a Joint Venture for preparation of Technical and Financial Proposals for Consultancy Services for "The Project" to be submitted to National Highway Authority, Islamabad (hereinafter called "The Client").

The Parties intend to do the following:

- a. Prepare and submit a mutually agreed Technical and Financial Proposals for the Project;
- b. Agree to propose suitable staffing with high level of competence to form a competitive team for the Project.
- c. Enter into the mutually agreed Consultancy Contract Agreement with the Client, if the project is awarded.
- d. Perform all the services to be undertaken for the Project under the Consultancy Contract Agreement if signed.

2. The authorized representative of JV shall be M/s..... for the future official correspondence with the client on behalf of JV.



Feasibility (Technical + Commercial) Study and Detailed Design for Construction of Shahdara Flyover on Build - Operate - Transfer (BoT) basis under Public Private Partnership (PPP) Modality

3. The original letter of intention(s) of the JV member(s) on their letterhead is/are attached at...

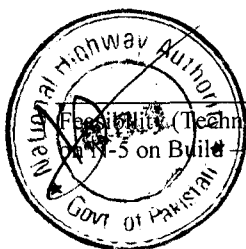
For and on behalf of

.....
Sign & Seal of the Lead Firm

.....
(Authorized Representative of the Firm)*

** Authorized Representative to sign the Letter of Intention can be;*

- o For Sole Proprietor firm; Owner of the Firm, otherwise Owner may authorize any person. (provided Authorization Letter be submitted)*
- o For Partnership firm; Director of the Firm; otherwise, authorized personnel (provided Authorization Letter be submitted).*
- o For Private Limited firm; Director of the Firm, otherwise, authorized personnel (provided Authorization Letter be submitted).*
- o For Public Private Limited firm; Director of the Firm, otherwise, authorized personnel (provided Authorization Letter be submitted).*



Annex-B

AFFIDAVIT
(Regarding Blacklisting)

Subject: [NAME OF THE PROJECT]

I, the undersigned, do solemnly declare that M/s [NAME OF THE FIRM] has neither been blacklisted nor any contract rescinded in the past for non-fulfillment of contractual obligations.

Signature of Authorized
Representative of the firm(s)

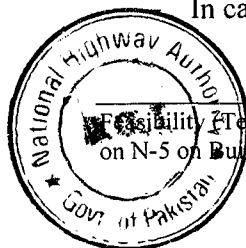
Date: _____
Day/Month/Year

(Seal)

Attested by
the Oath
Commissioner

Note:

- The Affidavit is to be submitted on Stamp Paper of minimum Rs. 30/- duly attested by the Oath Commissioner.
- In case of Single Entity, to be provided by the firm.
- In case of JV, to be provided by all the JV members



Feasibility (Technical + Commercial) Study and Detailed Design for Construction of Shahdara Flyover
on N-5 on Build – Operate – Transfer (BoT) basis under Public Private Partnership (PPP) Modality

Annex-C

UNDERTAKING
(Regarding Personnel Availability)

Subject: [NAME OF THE PROJECT]

I, the undersigned, do solemnly declare that the proposed personnel shall be available for the subject assignment in the project duration as per the terms and condition specified in the Request for Proposal (RFP).

Signature of Authorized
Representative of the Lead firm

Date: _____
Day/Month/Year

(Seal)

Attested by
the Oath
Commissioner

Note: The Affidavit, on Stamp Paper of minimum Rs. 30/- duly attested by the Oath Commissioner, is to be submitted by the Lead firm only.



Feasibility (Technical + Commercial) Study and Detailed Design for Construction of Shahdara Flyover
on Build - Operate - Transfer (BoT) basis under Public Private Partnership (PPP) Modality

Annex-D

General Manager (P&CA)
National Highway Authority,
Islamabad, Pakistan

Power of Attorney
(Regarding submission of proposal)

Subject: [NAME OF THE PROJECT]

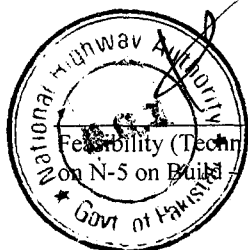
Dear Sir,

I, the undersigned, authorize Mr. _____ S/o Mr. _____ having CNIC No. _____ to attend the submission and Opening of Proposals on behalf of all JV members. *(Insert name of sole consultant in case of single entity else name of all JV members)*. He is authorized to attend, submit, sign and stamp any missing pages of the proposal (Technical and Financial) for above-mentioned project on... *(Insert date)*.

Signature of Authorized
Representative of the Lead firm

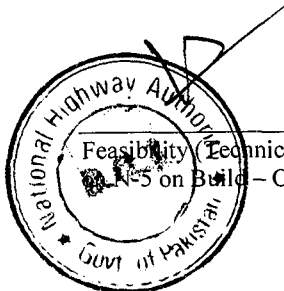
Date: _____
Day/Month/Year

Signature and initial of Authorized Representative



Feasibility (Technical + Commercial) Study and Detailed Design for Construction of Shahdara Flyover
on N-5 on Build - Operate - Transfer (BoT) basis under Public Private Partnership (PPP) Modality

FINANCIAL PROPOSAL FORMS



FINANCIAL PROPOSAL SUBMISSION FORM

{Location, Date}

To: [Name and address of Client]

Dear Sirs:

We, the undersigned, offer to provide the consulting services for [Insert the Project Name] in accordance with your Request for Proposal dated [Insert Date] and our Technical Proposal.

Our attached Financial Proposal is for the amount of {Insert amount in words and figures}, including all Federal, Provincial & local taxes applicable as per law of the land. {Please note that all amounts shall be the same as in Financial Proposal Form A-17}.

Our Financial Proposal shall be binding upon us subject to the modifications resulting from Contract negotiations, up to expiration of the validity period of the Proposal, i.e. before the date indicated in Clause 4.5 of the Data Sheet.

We confirm that we have no condition to state that may have financial implications over and above the amount quoted above.

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

We remain,

Yours sincerely,

Authorized Signature* {In full} _____ {and initial} _____

Name and Title of Signatory: _____

Name of Consultant (Firm's name or JV's name): _____

In the capacity of: _____

Address: _____

Contact information (phone and e-mail): _____

* The above signatory or his authorized representative should attend the proposal submission and opening with authority to sign and stamp any missing pages of proposal in line with instructions given in clause 1.8 of the Data Sheet.



BREAKDOWN OF RATES FOR CONSULTANCY CONTRACT

Project: _____ Consultant: _____

Name	Position	Basic Salary per Cal. Month	Social Charges (%age of 1)	Overhead (%age of 1+2)	Sub-Total (1+2+3)	Fee (%age of 4)	Rate per Month for project Office	Field Allow. (%age of 1)	Rate per Month for Field Work
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Notes:

Item No. 1 Basic salary shall include actual gross salary before deduction of taxes. Payroll sheet for each proposed personnel should be submitted at the time of negotiations.

Item No. 2 Social charges shall include Client's contribution to social security, paid vacation, average sick leave and other standard benefits paid by the company to the employee. Breakdown of proposed percentage charges should be submitted and supported (see Form A-13).

Item No. 3 Overhead shall include general administration cost, rent, clerical and junior professional staff and business getting expenses, etc. Breakdown of proposed percentage charges for overhead should be submitted and supported (see Form A-14).

Item No. 5 Fee shall include company profit and share of salary of partners and directors (if not billed individually for the project) or specified in overhead costs of the Company.

Item No. 7 Normally payable only in case of field work under hard and arduous conditions.

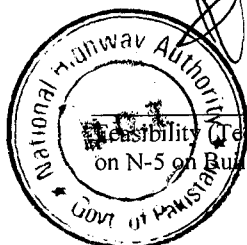
Note 1 The minimum percentage of item (1) should preferably be 50% of (8).

Note 2 The consultant is to provide appointment letter and affidavit/undertaking duly signed by each of the individual staff members showing salary rates as above. Further during execution each invoice will also be provided showing that the professionals have been paid their salaries as per basic rates specified therein. Failing to which, the Client will take punitive action against the consultant and shall deduct the deficient amount from his monthly invoice. Moreover, it will be considered as a negative mark on his performance that will be considered for future projects.

Full Name: _____

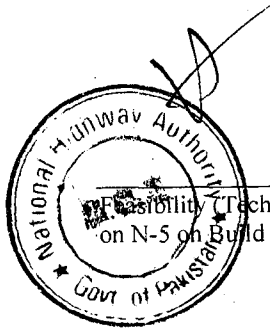
Signature: _____

Title: _____



BREAKDOWN OF SOCIAL CHARGES

Sr.No.	Detailed Description	As a %age of Basic Salary



Feasibility (Technical + Commercial) Study and Detailed Design for Construction of Shahdara Flyover on N-5 on Build – Operate – Transfer (BoT) basis under Public Private Partnership (PPP) Modality

BREAKDOWN OF OVERHEAD COSTS

Sr. No.	Detailed Description	As a %age of Basic Salary and Social Charges



ESTIMATED LOCAL CURRENCY SALARY COSTS/REMUNERATION

Sr. No.	Position	No. of persons	Individual man months	Monthly Billing Rate	Total Estimated Amount (Rs.)
I. Professional / Key Staff					
Sub-Total:					



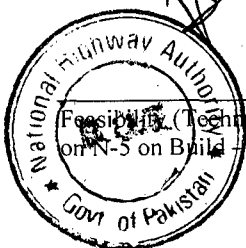
Form A-15

Page 2 of 2

ESTIMATED LOCAL CURRENCY SALARY COSTS/REMUNERATION

Sr. No.	Position	Staff-Months	Monthly Billing Rate	Total Estimated Amount (Rs.)
II. Non-Key / Support Staff				
Sub-Total:				

Note: The bidders are required to quote the rates of Non Key/Support Staff given in the TOR in above table. The bidder(s) may propose Non Key/ Support Staff Person-Months in addition to those given in TOR; however, in such a case tenable reasons must be given in the Technical Proposal Submission Form A-4 "Comments on TOR". The Client's negotiation committee will deliberate on the requirement of additional staff during negotiation meeting. It is also to be noted that the Client is not bound to agree to the reasons given in Form A-4.



Form A-16

DIRECT (NON-SALARY) COSTS

Sr. No.	Nomenclature	Unit	Qty.	Unit Price (Rs.)	Total Amount (Rs.)
1.	Rent for Office Accommodation	L.S			
2.	Office Utilities Costs	L.S			
3.	Cost of Furniture / Furnishings	L.S			
4.	Cost (rentals) of Office/Other Equipment (on rental basis) i. Computers and accessories ii. Photocopy machines iii. Communication equipment iv. Drafting / Engineering equipment v. Transport Vehicles (Rentals) vi. Site visits and Meetings in Islamabad during currency of Project and Construction Works	L.S			
5.	Communication expenses	L.S			
6.	Drafting/ Reproduction of Reports	L.S			
7.	Office/ Drafting Supplies	L.S			
8.	Security Charges	L.S			
9.	Detailed Topographic Survey including Monumentation, GCPs, Inventory of Structures and other reference points, Stakeout of alignment including Report & Drawings Production, Instrument Rental Charges, Surveyor(s) & Survey Helpers Salary etc. (complete in all respects)	L.S			
10.	Soil and Material Investigation including Lab Testing, Report Writing, Salary of Material Engineer, Helpers, etc. (complete in all respects)	L.S			
11.	Geotechnical Investigation for Bridges (Boreholes of 30m Depth) including instrument rental, Salary of Geo-Technical Engineer, Helpers Report Writing, etc. (complete in all respects)	L.S			
12.	Environmental Impact Assessment including Report Writing, NOC Fee, Environmental Engr. Salary, Coordination with Pak EPA & Public Hearing Charges (complete in all respects)	L.S			

Sr. No.	Nomenclature	Unit	Qty.	Unit Price (Rs.)	Total Amount (Rs.)
13.	Traffic Survey including rental equipments, report writing & Salary of Traffic Engineer & Enumerators (compete in all respects)	L.S			
14.	Axle Load Survey including rental equipments, report writing & Salary of Traffic Engineer & Enumerators (compete in all respect)	L.S			
15.	Highway Safety Audit including Cost of Site Visits, Report Writing & Salary of Highway Safety Engineer & its team, etc. (complete in all respect)	L.S			
16*.	Others not covered above to comply with TOR requirement*	L.S			
Total					

NOTE:

* Any additional item\ cost quoted against this line item must have provided solid\ tenable justification(s) detailed in technical proposal submission Form A-4 "Comments on TOR" without indicating financial value therein. The client's negotiation committee will deliberate on the requirement of additional item\ cost in case such firm stands top ranked. It is also to be noted by the Consultants that the Client is not bound to agree to the reasons given in Form A-4.

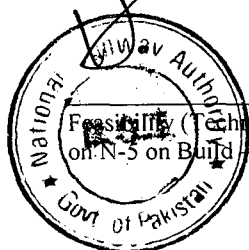
The salaries of Personnel mentioned in above table should not be reproduced in the remuneration of Key and Non-Key Personnel.



SUMMARY OF COST

Sr. No.	Description	Amount (Rs.)
1.	Salary Cost/ Remuneration	
2.	Direct (Non-Salary) Cost	
3.	Sub Total (1+2):	
4.	Sales Tax @ 16% on item S.No.3 above which shall be kept as Provisional Sum in the Contract Agreement	Not Applicable till final decision of the Court of Law ⁽⁴⁾
5.	Grand Total:	

- Note:
- 1- This cost is supposed to be built up in bid price and if anything is left blank it shall be deemed to be included in the cost.
 - 2- The dues and salaries of staff are payable by the consultant in time and not later than 10th of the following month positively. In case of failure to do so Client shall intervene and pay these dues and salaries of the concerned Personnel and recover from the invoice of the consultant at actual charges paid plus 1% of the amount. This will also be accounted for adversely in making assessment of the Consultants in the next evaluation process for selection of consultants with report of such defaults.
 - 3- Any Omission or arithmetical error made by the Consultants in entering the amount against item 4 above shall also be rectified during evaluation of the Financial Proposal.
 - 4- Relevant documents are attached at the end of RFP.
 - 5- The grand total is inclusive of all the applicable Federal, Provincial and Local taxes. All these taxes (except the Sales Tax) are required to be built in the quoted rates and not be mentioned separately.



APPENDIX-A

TERMS OF REFERENCE

(TOR)

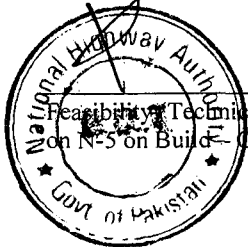


Table of Content

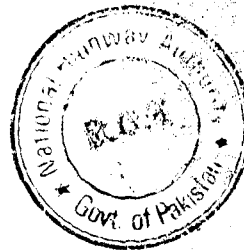
TOR Template shall include, in order and material, as follows:

Chapter - 1 Introduction

- 1.1 Background
- 1.2 Need Assessment
- 1.3 Project Definition
- 1.4 Project Objectives

Chapter - 2 Description of Project

- 2.1 Location
- 2.2 scope of work
 - (a) For commercial study
 - (b) For technical study
- 2.3 Technical parameter's
- 2.4 Time of start
- 2.5 Time period



CHAPTER NO. 1

INTRODUCTION

1.1 BACKGROUND:

National Highway N-5 traverses through the town of Shahdara just short of Ravi Bridge before entering Lahore. The commuters face considerable congestion. The problem is aggravated at the railway crossing near Imamia colony, where trains cross multiple times during the day and the road users are dissatisfied with the situation. There have been many complaints on the matter as forwarded through Citizen's portal. Some respite is expected after Lahore Eastern Bypass is opened to traffic. However, commuters headed towards Shahdara, Badami Bagh interior city of Lahore and neighboring areas would still use the same route.

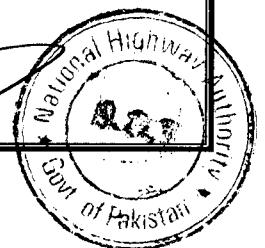
To proceed further, NHA intends to appoint the consultant for feasibility (Technical + commercial) study & Detail design for "Construction of Flyover at Shahdara" (Imammia Railway crossing). N-5 on Public Private Partnership (PPP) mode.

1.2 NEED ASSESSMENT:

- ❖ This flyover will save time that is wasted in congestion, thereby generating travel time savings.
- ❖ Provision of a standardized road with good riding quality will reduce the Vehicle Operating Costs (VOC) with direct impact on Country's micro economics.
- ❖ Provision of employment opportunities during and after the construction of the project.

1.3 PROJECT DEFINITION:

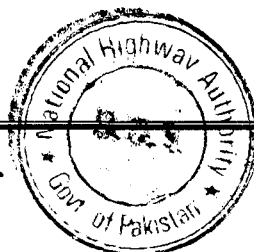
The project starts near railway crossing at Imamia Colony. Already available design of six (6) lane flyover with NHA, will be shared with the consultant. The Consultant would conduct Preliminary studies given to NHA for decision regarding Scope of work and thereafter proceed for detailed design and Commercial and technical studies Keeping in view the followings.



- The initial urban situation as to the number of roads converging on N-5 at two locations. One is the Kala Katie Narang Mandi road converging beyond railway crossing, 2nd one at Shahdara Chowk, Lahore Sargodha road converges N-5 from the western side while old Ravi bridge road comes from the eastern side.
- The consultant should also consider the breaching sections of river Ravi in their study and existing FRL (Finished Road level) should not be disturbed in urban area.
- Both options for six (06) lane (dovetail NHA available design with his concept for continuous flyover)/four (4) lane flyover at Imamia colony and extend this flyover through Shahdara Town till Shahdara Chowk.
- Both option for six (6) lane or four (4) lane flyover at Imamia colony dovetail with his concept for at Grade solution or other possible solution upto Shahdara Chowk.
- The consultant shall also consider local traffic flow below flyover and will propose suitable solution acceptable to NHA.

1.4 PROJECT OBJECTIVES:

- i) Smooth traffic flow on N-5 in the Lahore city area will be possible.
- ii) Time saving of traffic user will be possible.
- iii) Vehicle operating cost will be reduced.
- iv) Employment opportunity will be developed.
- v) Due to construction of Flyover frustration due to traffic jam of the inhabitants of nearby vicinity will be reduced.
- vi) Lahore is the central hub for commercial activities in Punjab province, therefore, passenger vehicles as well as freight vehicles will approach the Lahore form North through N-5 & M-2 via Kala Shah Kaku (KSK) without any suffer of 15-20 minutes delay in long queues.
- vii) Economic growth of the country will be improved/ accelerated.
- viii) Health of people of nearby vicinity of project area will be improved.



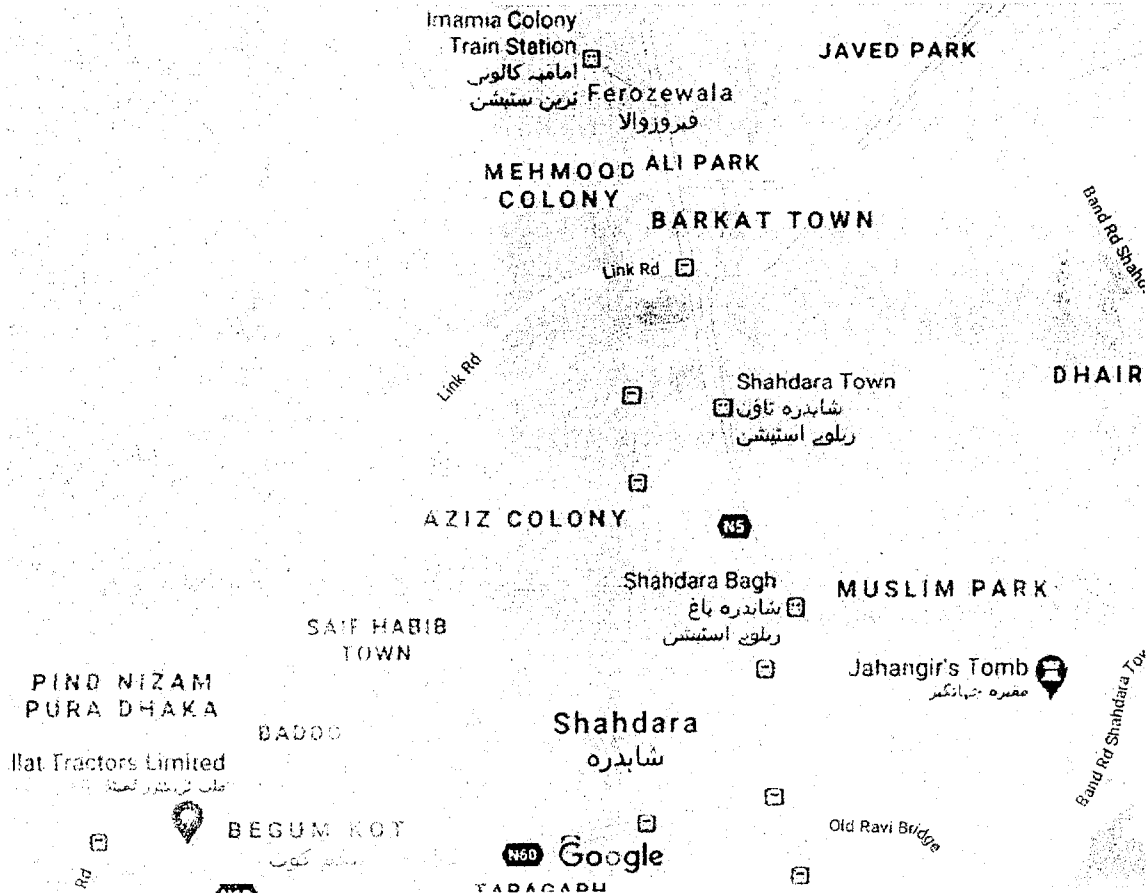
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CHAPTER NO. 2

DESCRIPTION OF PROJECT

2.1 LOCATION OF PROJECT:

The project is located in district Lahore of Punjab province. The project starts near railway crossing at Imamia Colony. (Location Map is given as under):

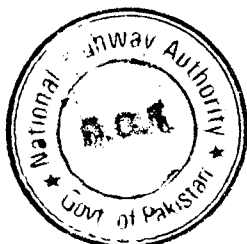


2.2 SCOPE OF WORK:

(a) FOR COMMERCIAL STUDY

The scope of work is narrated here under but not limited to following:

- Option Analysis with complete length as well as limited to railway crossing flyover as already described in the TOR.
- Workability of toll models and “Willingness to Pay” survey
- Review of legal framework
- CAPEX (Capital Expenditure) Analysis



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- OPEX (Operational Expenditure) Analysis
- Revenue Analysis
- Debt servicing & Amortization analysis
- Financial model & bankability analysis
- RFP and draft Concession Agreement
- PPP Procurement assistance in technical proposal stage

(b) FOR TECHNICAL STUDY:

The scope of work is narrated here under but not limited to following:

- Feasibility (Technical + Commercial) & Detail Design for 4 lane or 6 lane flyover dovetail up to Shahdara Chowk.
- Consultant will conduct Initial Study and given to NHA. After detail presentation on all options by the consultant, then will proceed to finalize task.
- Detailed Topographic survey
- Presentation of Concept based on topo survey
- Traffic survey, OD survey & detailed traffic study with diversion analysis for Lahore Eastern Bypass
- Axle Load Survey
- Soil & Material Investigations
- Construction Machinery Report
- Pavement Design
- Horticultural requirements
- Drainage design
- Structural Design for the Flyover
- Geometric design report with drawings
- Highway Safety Audit Report
- Road furniture design including traffic signs and gantries.
- Land Acquisition & utility folders (as per requirement)
- Cost Estimates & BOQ
- Environmental Impact Assessment (EIA) Study
- Economic Analysis Report
- Preparation of PC-I
- Traffic diversion and operational Plan
- Safety measures Plan during construction activities for traffic commuters and Human resources considering for not only of project Area but also for locals walking/ passing through it.

2.3 TECHNICAL PARAMETERS:

Technical Parameters are given as under:

Location	Punjab
Length (Approx.)	As per proposal of consultant
No. Of Lanes	4-lane/6-lane



Carriageway width	3.65 m (each)
Design speed	120km/hr
Drainage	As per requirement
Geometric improvements	As per Highway Safety Audit manual of NHA

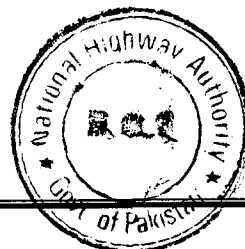
2.4 TIME OF START:

The services shall be commenced immediately after the signing of the contract agreement.

2.5 TIME PERIOD

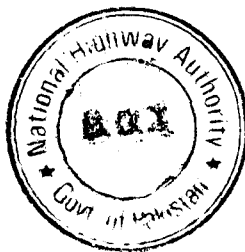
The services specified in the TOR shall be completed and all relevant reports submitted in the form and format acceptable to the Employer, within **04 months** from the date of signing of Contract Agreement. Another **One (01)** month period shall be required for relevant experts, so as to help NHA on Technical Design matters and assistance in Technical Bid Evaluation.

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TERMS OF REFERENCE
(Including Description of Services)



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CHAPTER NO. 3

TOR / SCOPE OF SERVICES

3.1. INTRODUCTION

In pursuance of the provision in Public Sector Development Programme (PSDP 2020-21), Feasibility Study for Construction of Shahdara Flyover on N-5 is required for implementation of this project on Build – Operate – Transfer (BoT) basis under PPP modality.

3.2. SUMMARY OF SCOPE OF SERVICES

The scope of services under this ToR mainly involves but not limited to Technical Feasibility and Commercial Feasibility study for Construction of Shahdara Flyover on N-5 on Build – Operate – Transfer (BoT) basis under PPP modality. The activities related to Technical Feasibility are described in Part-I, while Commercial Feasibility activities are described in Part-II. NHA requires that the services/submissions should be made separately as elaborated in “Sequence of Activities” in the following sequence”. This aspect may be discussed in further detail during kick-off meeting.

3.3. SEQUENCE OF ACTIVITIES

Overall scope of work and the sequence of activities is as following:

Sr. No.	DESCRIPTION
STAGE-I	
a)	Inception Report for Technical Feasibility
b)	Inception / Outline Report for Commercial Feasibility
c)	Alignment Study Report alongwith KMZ / KMLfile
STAGE-II	
d)	Preliminary Topographic Survey Report alongwith Plans
e)	Traffic Survey Report
f)	Axle Load Survey Report
g)	Preliminary Hydrology & Hydraulic Study Report
h)	Preliminary Soil & Material Investigation Report
i)	Preliminary Design Drawings and Engineer's Estimate
j)	Preliminary Technical Feasibility Report
k)	Preliminary Commercial Feasibility Report
STAGE-III	



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l)	Detailed Topographic Survey Report alongwith Plans
m)	Detailed Hydrology & Hydraulic Study Report
n)	Detailed Soil & Material Investigation Report
o)	Geotechnical Investigation Report
p)	Condition Survey Report
q)	Environmental Impact Assessment (EIA)Report
r)	Design Report
s)	Final Design Drawings
t)	Land Acquisition & Utilities Folders
u)	Road Safety Audit Reports
v)	Construction Machinery Report
w)	Engineer's Estimate
x)	Final Technical Feasibility Report
y)	Final Commercial Feasibility Report
z)	Ground Validation & Alignment Stakeout (if required)
aa)	PC-I (Project Cost including Viability Gap Funding)
bb)	PC-I (Land)
cc)	RFP Document including Model Concession Agreement

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A.11

Part-I (TECHNICAL FEASIBILITY STUDY)

4. DESIGN PARAMETERS, CODES, & STANDARDS ETC.

NHA understands that the parameters, codes, and standards etc., given in following table should be followed for carrying out the services required under this contract. However, these may be reviewed by the consultant and improvement may be proposed on the basis of specialized knowledge and expertise in the context of project. Proposed improvements, if any, should be

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realistic, practicable, and cost effective in project context. If consultant requires any clarification regarding parameters then same must be solicited in written and a timely manner instead of making a presumption. Bare minimum standards or inappropriate combination of the recommended standards must be avoided in all design aspects.

Geometric Design	<i>A Policy on Geometric Design of Highways and Streets</i> by AASHTO (preferably latest published diversion). Roller Coaster profile will not be acceptable tall.
Pavement Design	<i>AASHTO Guide for Design of Pavement Structures-1993</i>
Roadside Design	<i>AASHTO Roadside Design Guide</i> (preferably latest published version)
Lighting	<i>Roadway lighting design guide</i> by AASHTO (preferably latest published version)
Structural Design	<i>AASHTO Guide Specifications for LRFD Seismic Bridge Design</i> (preferably latest published version) along with <i>West Pakistan Code of Practice for Highway Bridges</i> and <i>Seismic Zone Mapping of Pakistan</i>
Drainage Design	<i>Highway Drainage Guide lines</i> by AASHTO (preferably latest published version)
Design of Traffic Control Devices, Work Zone Safety and preparation of Maintenance & Protection of Traffic(MPT)Plans'	<i>Manual of Uniform Traffic Control Devices (MUTCD)</i> by FHWAUSA (preferably latest published version) with due consideration to the requirements of NHA
For testing and specifications of materials, following codes and standards will be followed:	ASTM, AASHTO, NHA General Specifications etc.
Capacity Analysis and Level of Service analysis	<i>Highway Capacity Manua</i> l(preferably latest published version)
Engineer's Estimate	As per prevailing CSR of NHA

5. KICK-OFF MEETING

Kick-off meeting will be held wherein Consultant will present to NHA the approach & methodology for carrying out services and the corresponding timelines etc.

6. DETAILED SCOPE OF SERVICES

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6.1. Data Collection & Coordination with Concerned Organizations

The consultant will collect available data & information required for preparing the documents, reports and design etc. of the Project. The consultant will also collect requirements and development plans etc. (if any) of all the concerned agencies/ organizations/ departments/ stakeholders through extensive and close coordination; this is an essential requirement and should be given due importance by the consultant.

6.2. Inception Report for Technical Feasibility

The consultant will carry out desk studies and then proceed for reconnaissance visit. An Inception Report will be submitted which should elaborate the observations made in the reconnaissance visit along with photographs and describe the project in appropriate detail. The report should also explain the methodology for adhering to the requirements spelled out under this ToR.

6.3. Alignment Study Report

Depending upon project requirements, the consultant will study the alignment in detail and submit Alignment Study Report along with KMZ file. A detailed presentation on the alignment will be given to NHA for perusal and consideration.

If improvement / Upgradation / dualization etc. is required then the existing alignment will be analyzed in appropriate detail and then presented in Alignment Study Report. The Report should contain self-explanatory maps & photographs, detailed description of the alignment along with key features, district-wise division, significance, description of structures especially bridges on major rivers, obstructions in the form of urban centers etc., requirement of link roads, and recommendations regarding geometric improvement etc. The same will be applicable in case of bypasses.

If a new alignment is required to be identified, then all possible alignment options will be explored, analyzed, compared, and then presented in Alignment Study Report. The Report should contain detailed description of all alignment options along with self-explanatory maps, photographs, and comparative analysis etc. Detailed/elaborated description of the recommended alignment will be provided along with key features, district-wise division, significance, maps & photographs, tentative list of required/proposed structures especially bridges on major rivers, obstructions in the form of urban centers etc., requirement of link roads etc. The same will be applicable in case of bypasses.

6.4. TOPOGRAPHIC SURVEY

Topographic survey forms the basis for Design. Poor quality of survey work produces not only incorrect designs but also results in post construction problems with variations in cost and claims. It is desired that the Survey work is of top most order.

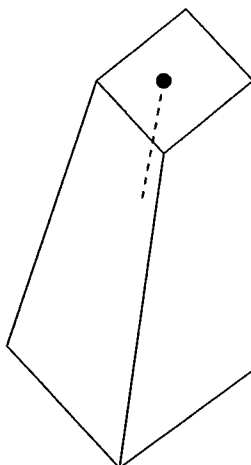


As per "Surveying & Mapping Act 2014", the Survey company must comply with the requirement of the Act. It is therefore recommended that consultant should use the latest technology for the topographic surveys, which include at least 04 (four) GPSDF for establishment of high accuracy control points (as per required plan, specified herein). In case the consultant does not have the requisite number of GPSDF, it is advised to hire services of professional survey companies having the required expertise. A network of control points along the corridor will be developed involving at least 4 instruments.

Before mobilizing to site for Survey, the Consultant shall submit to the Client detailed topographic survey program with actual human resources *planned to be deployed*. The consultant shall specify *the time line of survey program*. Total number of equipment with models and *calibration certificates not more than 6 months old* shall be produced. The *name and qualifications of surveyors* shall also be submitted. NHA reserves the right to interview the surveyor if required. Upon request, the consultant should change the surveyor. If *consultant wants to outsource the Survey work, it will be mandatory to take prior approval of the Client*. NHA will ensure that the survey firm is not black listed and has sufficient resources and complies with the Surveying and Mapping Act 2014.

6.4.1. Survey Monuments

Besides start and at the end, it is required that Monuments will be fixed in the traverse line at an interval of about 300 to 400 meters. These will be fixed at such locations that these are least susceptible to disturbance and damage and do not pose a threat to traffic on existing roads/tracks etc.



Permanent Ground Monument made of Concrete 1:4:8 with 75 mm steel nail embedded at center. Using spray paint and a stencil, the monument number shall be painted.

The size of monument shall be 150 mm square at top and 300 mm square at bottom. The height of monument shall be 900 mm. Out of which 750mm shall be buried in the ground.

6.4.2. Control for Traverse

Projection: UTM

Datum: WGS84

Vertical Datum: MSL

6.4.3. Horizontal Control

Precise Primary Controls (ITRF CONTROLS)

Minimum (4) D Primary Controls at start and end of the Project or as many as may be required such that the distance between these points shall not be more than 10 km. Minimum observation time shall be at least ten (10) hours for each of these points. These points shall be validated/verified with International Fixed Stations in WGS84/ITRF reference frames for an average ambiguity resolution of 50% or better for a reliable network solution.

6.4.3.1. Primary Controls

DGPS Primary Controls will be established at a maximum distance of 2.5 kms with one base and one rover using leapfrog method, by applying adjustments to create network. Minimum observation time will be at least two (2) hours for each of these points. At every 5 kms one additional DGPS point with two (2) hours



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observation (to form an inter-visible pair) will be established, which may be used for Total station if needed for topographic survey.

6.4.3.2. Secondary Controls

DGPS Secondary Controls shall be established at a maximum distance of 333 meters with one base and two rovers at alternate sides of Alignment (to form triangular network) using leap frog method, by applying adjustments to create network. Minimum observation time shall be at least 45 minutes for each of these points.

6.4.4. Vertical Control

Vertical Control shall be established using MSL from first order SOP Bench Marks with double run leveling. Digital level with an accuracy of 0.3 mm or less and single section 2m/3m staff or invar staff with change plate on bottom shall be used. The maximum distance between the two successive reading points shall not be more than 50m. All horizontal control points shall be related to monuments made for Horizontal primary and secondary controls with double run level to control the height as mentioned above.

6.4.5. Monuments for Horizontal and Vertical Controls

The monuments for controls shall be as per NHA specifications. The ITRF Controls, Primary Controls shall be tied with two permanent points as per NHA Specifications.

6.4.6. Topographic Survey (Scale 1:1,000); including on ground features, Buildings, Utilities and Crossing Roads

Topographic Survey will be performed within the ROW Limits. At important control section, if the large-scale structures are proposed to be built on the sections, the survey range can be extended reasonably, if necessary. Enough Spot Levels (points) shall be taken to create a topographic map in the scale of 1:1,000 H:V Scale.

The Consultant is required to observe 10 cross-sections across the River Khadir, Bank to Bank. Three cross-sections at the Bridge Site (one center-line and other two adjacent to centerline up and down stream of the bridge. The BM for upon which the Model study survey was done should be incorporated in the traverse/ level circuit.

6.4.7. Centerline Points (stake) and Measurement of elevation of route stake

- The distance between the centerline points shall be 25m in general, in case of the pond the stake is fixed on the bank of the inclination and waterline.
- The distance between the stakes is 5m-8m on the section of roads which have retaining walls.
- The distance between the stakes is 10m on the interchange slip road whose radius is less than 60m.
- The distance between the stakes is 5m for the 10m before and after the chainage of the abutment for a total distance of 20m.
- Minimum three longitudinal sections (parallel to Alignment) including the center axis, the left and right edge lines of the flyover shall be measured. For the places



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where the topography is changed and flyover pier and abutment, more stakes shall be established.

- For the culverts, the chainage and elevation of the crossing point will be measured; the longitudinal section of the water channel 50m upstream and downstream of the crossing point will also be measured.
- The stakes are placed on the edges of the crossed roads. The stakes should be fixed on the crossing points. There is also a need to collect the coordinates, elevation, angle, width and road level of the crossing points (50m around the crossing point). The coordinates, elevation, and angle of left, middle and right lines of the important crossed roads should be collected (100m around the crossing point).
- The position of 10KV high-tension pole (tower) around the route within 100m, and the power line's lowest elevation on the crossing point.
- The stake's elevation shall be measured one by one.
- It is necessary to establish more stakes in case there is any pipeline or building crossing the alignment; the height difference between the bottom elevation of such pipeline or building and the ground shall be measured.

6.4.8. Cross section Points

- The cross section should be measured one by one.
- The cross section should be measured at 25m interval for the straight-line sections and curve sections with radius larger than 5000m. At curves having radius less than $R:5000$ m, the cross sections shall be measured at 20m interval.
- The cross section shall be measured to the ROW limit.
- For the alignment sections with proposed retaining wall, the cross section shall be measured at 5m interval.
- For the bridge pier, the measuring range of the cross section is 10m at both left and right sides of the center; whereas for the bridge abutment, the measuring range is till the ROW limits.

6.4.9. Interchanges (1:1,000) Map

Extraction of features will be done & points will be taken beyond the ROW of 100m and inside the minimum Region defined for Interchanges to create 1:1000 map. The minimum length of existing road to be included in topographic survey (for interchange ramps merging) should not be less than 250 m.

6.4.10. Riverine Survey for Crossing Canals - Short Bridge

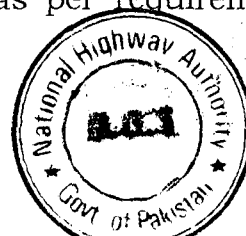
Measure the center longitudinal section of the canal from 100m upstream to 50m downstream, and measure the cross section of the canal at 10m interval which is perpendicular to the axis of river. The canal edges must be taken recorded along with all break points to clearly define the canal shape.

6.4.11. Riverine Survey for Crossing Rivers - Long Bridge

In case the crossing of Major River is encountered, sufficient cross-sections will be required to run the physical or numerical model for computation of water surface profiling. Location of cross-sections will be as per requirement of the Software.

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6.4.12. Survey for Crossing Water Channels/ Nullas

Measure the center longitudinal section of the water Channel/Nullas(if any) from 100m upstream to 50m downstream and measure the cross section of the water channel/nullas at 10 m interval, which is perpendicular to their axis. Minimum 5 points shall be taken at each cross section to correctly depict the top and bottom of the sloping bank, width of bank and center of channel. The distance between the cross-section points shall not be more than 5m for wider water channels/Nullas.

6.4.13. Survey corridor

The detailed topographic survey in normal circumstances shall be carried out in a corridor of 30 m (15 m from CL on either side). At locations of crossing rivers & nullas, the detail of survey extent is given in respective sections.

6.4.14. Mapping (Unit of Measurement)

Metric units shall be used throughout.

6.4.15. Scale

Besides soft copy, mapping of drawings shall be plotted to a scale of 1:1,000.

6.4.16. Details to be shown (if any) but not limited to the following;

All natural or manmade erections above ground need to be depicted in the topographic survey. Enough points should be recorded, so that its clear picture including identification, size and elevation is available for the designer. The consultant should also depict underground utilities with markers available at site. Intelligent nomenclature need to be adopted to describe the feature. The information should be available in CAD software in layer format with fully defined attributes.

Buildings/Structure

1. The plinth line of all permanent buildings.
2. Construction type of building (whether brick (B), semi-concrete (SC), concrete(C).
3. double storey (D) etc.).
4. Ruins or partially demolished buildings or foundations- by the wall and masonry visible at the time of the survey.
5. Names and type of usage of all buildings, schools etc.
6. Buildings under construction

Roads, Tracks and Footpaths

1. Curb line or edge of surfacing to carriageways, and along the edge line markings.
2. Tracks.
3. Pedestrian bridges and footpaths.
4. Traffic islands (similar to curb line).
5. Destination of road for junctions' level.



6. Bridges (over railway, river, etc.)
7. Levels over railway line in case of at grade or grade separated crossings.
8. In case of power transmission lines crossing alignment, level of electric wire with respect to survey control shall be recorded.

Industrial

1. Name and type of industry, Boundary wall and building structure inside.
2. Tanks (indicate type of material stored e.g. fuel, gas, water, etc.)
3. Sewage disposal works details.
4. Chimneys (substantial).

Road Furniture (In case of existing road)

1. Km post (value to be noted).
2. Bus stop facilities.
3. Traffic signal posts and controllers.
4. Guardrails.
5. Road signs.

Boundary Features

1. Fences.
2. Gates.
3. Boundary stones located/used for fieldwork.
4. Walls.
5. Burial grounds.
6. Historical areas.

Railways

1. Gauge faces of railway running rails with elevations of rail top.
2. Level crossings.
3. Platforms.
4. Bridges (over road, river, etc.)
5. Station building.
6. Telegraph poles (indicate the reference numbers).

Ruins/Debris/Structures

1. Ruins or partially demolished foundations-by the wall and masonry visible at the time of the survey
2. Invert level of Drainage Structures

Survey

1. Survey Department Trigonometric Stations
2. Permanent Ground Markers (IP's, RM's, TBM's, etc.)



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3. Survey Department Benchmarks used (Indicate reference number and level)

Woods, Trees & Recreation Areas

1. Playing field.
2. Land-use and vegetation, etc.
3. In case of trees in the survey corridor, the surveyor has to assign a code defining the girth of the tree. Trees with varying girth as specified in the CSR for payment will be in respective layers.

Slopes and Earthworks

1. Cutting and embankments with any protection work done
2. Terraced slopes
3. Borrow pits / Quarries
4. Retaining wall
5. Rock outcrops
6. Mining tips
7. Indicate date of survey if on-going earthworks is present and mark the affected area

Services and Utilities

1. Transformers (boundary fences only).
2. Electricity sub-stations and switch boxes (boundary fences only).
3. Pylon lines (indicate levels at lowest point at sag and at pylon towers).
4. Pylon bases.
5. Pylon reference numbers and voltage of transmission.
6. Radio, TV station masts or towers.
7. Telecom poles.
8. Electricity poles.
9. Water mains pipes and stop valves (Indicate diameter of pipe).
10. Manholes (circular and square).

Water & Drainage

1. The top of banks of all water features over 1.0-meter-wide shall be detailed and the bottom of banks as indicated by the water level at the time of the survey. The direction of flow of all river, streams and watercourses shall be indicated.
2. Slopes with height greater than 1.0 meter of too sharp gradient to be shown by contours, including river and stream banks are to be shown on conventional markings and the top and bottom of slopes are to be shown as dotted lines.
3. Slope conventions shall be drawn as near as possible to indicate the actual shape of the slope face, i.e., all berms and terraces shall be detailed.



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4. The location of existing roads, bridges or river training works of Irrigation Department (if any) or else should be clearly indicated. Any other features not listed, which are requested by the Client shall also be shown.

6.4.17. Bridge details (if any)

The bridge details shall be shown on a separate drawing for each bridge. The bridge observations shall include the following: -

- a. The coordinates and levels of the four corners of the bridge (points shall be on the adjacent road surface), the two edges of the piers, abutment and wing walls.
- b. The coordinates and levels of the bridge deck to the intermediate piers (if any) of the bridge.
- c. Length, width and type of construction of bridge.
- d. The type and location of services adjacent to the bridge.
- e. The coordinates and levels of the centreline and the road on the bridge at approximate intervals of 5 m.
- f. The cross-sectional clearance envelope at the two sides of an overpass ridge (with respect to the road centreline passing underneath) showing all the relevant levels, offsets and skew angle.

6.4.18. Culvert details (if any)

Details of each culvert are to be shown on the survey plans and a separate sheet tabulation of the following information is to be submitted with the plans:

- a. Type of culvert and diameter.
- b. Chainage of culvert at the road centreline.
- c. Skew angle of the culvert from the centreline.
- d. Length of culvert from each side of the centreline.
- e. Invert levels of the inlet and outlet.
- f. A sketch of the inlet and outlet structures including all visible dimensions to a scale of 1:200.

For major culverts (dia. > 2.0m) the outlet structures are to be properly measured through recording enough points so that the culvert can be modeled in CAD.

6.4.19. Existing Road/ Embankment

In case alignment runs along the existing road, sufficient points should be taken across the existing road to fully define the cross-section. Below are **minimum** points shown for the existing roadway cross-section. For the existing carriageway, the width of carriageway, inner and outer shoulders should be clearly identified and coded.



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6.4.20. Details of Junctions and Existing Roads

The Surveyor shall survey all junctions to enable the designer to design the junction properly. A corridor width of 70m shall be taken for a distance of not less than 150 meters up and down the proposed intersection of the road or as required by the client.

All paved roads, main roads and footpaths or tracks having width greater than 2m shall have a minimum of two (2) points defining both edges of the carriageways. Consecutive points along the road feature shall not exceed 20m in rural areas and 10m in urban or built-up areas. More points are generally needed to define curved feature such as slip roads, islands, etc.

Levels of the road centerline shall be recorded for paved roads having widths greater than 6.0m. The main destination of the road from the junction shall be recorded by the Surveyor.

Where necessary to survey along an existing road, the Surveyor shall follow the marked changes along the centerline. In addition to the road edges, consecutive points along the edges of the carriageway (i.e. along the edge line marking on both sides) shall be picked up and shall not exceed 10 m. More points are generally needed to define super-elevation changes at curve sections.

6.4.21. Digital Ground Models (DGM)

The product of the filed survey data after processing shall be DGM. The accuracy of DGM shall depend upon the accuracy of the digital data collected in the field. Before processing the data, it is important to filter the data. All data points with incorrect x, y or z values shall be removed. It is also important to properly identify the break lines like road, nullah edge with natural faults. Void areas like buildings shall also be marked. The topography shall be fully labeled for every object recorded.

All survey feature lines will herein be referred to as 'strings'. The data shall be presented by the Surveyor in a form suitable for input to the software to be used for generation of DGM. Using the recorded data in x,y,z format on data logger, the ground surface over the required area shall be simulated by strings of coordinated information along characteristic lines on the terrain. The models shall consist of three-dimensional (3D) contour strings.

The existing road surface over the required area shall be simulated by 3D strings of coordinated information along characteristic lines on the existing carriageway. Any other strings that do not affect the accuracy of the ground surface may be assigned a null level.

The Surveyor will obtain prior approval from the Client for any strings that are to be digitized but that do not absolve the Surveyor from the subsequent accuracy and definition of the model. TIN (Triangular irregular network) will be developed by using software. Using TIN, Contour generation will be done.



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6.4.22. Grid

The coordinates of the DGM will be in Easting, Northing and elevations.

6.4.23. String Labelling

The ground features including break lines shall be labeled with the exact description shown under AUTOCAD LAYER NAME. Any additional labels may be considered and the Surveyor shall submit the list for approval prior to their usage in the DGM.

6.4.24. Property Model

This model shall be stimulated by a series of 3D null level strings and text strings and includes the following: -

- a) Strings of land lots (null level strings)
- b) Land use and type (Text Strings)

Attributes to land type and use shall be appended in the AutoCAD format. Such information shall be used by the Surveyor when preparing Land Utility folders at the end.

6.4.25. Contours

After digital data collection of survey points at site, the contour generation shall be done by using computer software. **The contour interval shall be 1 m.** The smoothness factor to be defined in the software should be such that it should not distort the ground contour representation. The contours should be well labeled.

During data collection, break lines on the ground should be collected very carefully that affects the contour generation.

If in the project, where steep slopes are likely to be encountered, the surveyor is required to use the laser equipped total stations that does not require prism to record the coordinates.

Contours shall be shown by continuous lines with a thicker line for every fifth contour (Prominent Contour). Contour and spot heights shall be differentiated from other detail. The value of each contour shall be indicated along the contours at intervals not exceeding 200 mm and / or the edges of the Mapping area.

Where because of undergrowth, on-going earthworks, swampy areas, or other obstructions, the ground surface is obscured, or access is restricted, and provided the Client prior agreement is obtained, contour can be shown by broken lines to indicate that their accuracy cannot be guaranteed.

6.4.26. Longitudinal Profile and Cross-Section

The longitudinal profile shall be plotted in A1/A3 size (as requested by Client) to a scale of 1:1,000 Horizontal and 1:100 Vertical with chainage interval of 25 m unless otherwise specified or instructed by the Client. The cross-sectional plan of the existing road shall be plotted in A1 size to a scale of 1:200 both horizontal and vertical with 25 m interval. The plan shall show the chainage



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interval as specified and the existing ground profile and all the existing features.

6.4.27. Field Books and Record

All field books and computer data must be properly kept and shall record truthfully all the survey work carried out. The Surveyor shall do all workings in proper books, adequately in good style and according to best practice. All field books shall be done in ink. Unsatisfactory works and errors shall be struck off and there shall be no superimposed writing or erasure. Client's Representative may check the field books now and then to ensure that a high standard of work is maintained. He may request the Surveyor to carry out some spot checks if he has reasonable doubt on the accuracy of the survey work. The Surveyor shall comply with such requests unless he can prove to the client's representative for his satisfaction that such checks are unnecessary. All field books and computer data shall be certified by the qualified surveyor.

Deliverable: As required under "Sequence of Activities", **Preliminary Topographic Survey Report along with Plans** will be submitted under Stage-II.

Detailed Topographic Survey Report along with Plans will be submitted under Stage-III on 1:1,000 scale for main carriageway and 1:5,000 for interchanges. Each control/traverse station will be shown in the report along with coordinates thereof, location map/diagram, sketch with reference to permanent features, and at least one photograph. Total number of equipment with models and calibration certificates not more than 6 months old will also be made part of Report. The names of surveyors will also be submitted.

6.5. TRAFFIC AND AXLE LOAD SURVEY

The consultant will submit Traffic & Axle Load Survey Program to NHA, wherein enough points for traffic study will be proposed in order to have best possible estimation of volume as well as classification of anticipated traffic and carry out reliable network modelling. The consultant should keep in mind that NHA intends to adopt Public Private Partnership mode of delivery. Therefore, traffic studies, related analyses, and modelling must take into account expected traffic of adjoining road network (existing and under-construction etc.)

The consultant will carry out minimum seven (7) days classified traffic volumes counts, O&D Survey, journey time travel survey, tyre pressure and axle load survey etc. Generated / diverted traffic volumes will be worked out. Origin-Destination Surveys will be carried out as and where required. Weekly and monthly correction factors will be worked out to arrive at Annual Average Daily Traffic (AADT). Growth factors will be worked out based on which the traffic will be forecasted.

Consultant shall undertake Axle Load Survey using portable weighing machine for at least seven (7) days. Consultant shall confirm in his Technical Proposal the availability of such equipment (ownership / rental basis). Sufficient samples of all



axle groups shall be weighed for each day. Data shall be annexed in the final report and used in the pavement design.

Network modelling will also be carried out as it is important study to avoid future congestion and bottlenecks in a system.

Deliverable: Traffic Survey Report and Axle Load Survey Report will be submitted which will not only form basis for economic & financial analysis but also for pavement design. Traffic growth factors, damaging factors etc. will be worked out and presented in report. Axle load survey is mandatory and required to be submitted along with traffic study failing which deliverable will be considered incomplete and non-compliant with contractual requirement and will not qualify for any payment. Analyses for Capacity and Level of Service using Highway Capacity Manual will also be made part of the report.

Since the Project is being taken up for PPP mode of financing, therefore reliable traffic estimation is highly required. Network modelling will be presented in the report to provide an

understanding of expected traffic pattern after development of project. NHA understands that *PTV Vissum* software is a good option; however, if consultant has any other good proposal it may be highlighted in technical proposal and discussed in detail at later stage.

The Consultant is required to take into account the Traffic movement to and fro Lahore Sialkot Motorway (LSM) and Lahore Eastern Bypass (LEB). Consultant will also consider local traffic flow below flyover and will propose suitable solution acceptable to NHA.

6.6. HYDROLOGY & HYDRAULIC STUDY

6.6.1. Objective

The objective of the hydrological and hydraulic study is to mathematically/numerically model the project area to design cross drainage structures and road embankment height to protect it from future floods. The major objectives are:

- Establishment of Waterway.
- Marking extents of the catchments' area along with its characteristics.
- Calculating Maximum Peak Flood Discharge based on meteorological data.
- Marking of flood plains and High Flood Levels
- Location of Cross Drainage structures.
- Hydraulic Design of Cross Drainage structures (Type, sizes / geometry and Energy dissipaters for erosion control etc.)
- Calculating Scour Depth for bridges.

6.6.2. Activities

The consultant will adopt state-of-the-art mathematical modeling approach using industry standard softwares for the hydrological and hydraulic assessment that will incorporate following activities:

a. Reconnaissance Survey



The field survey will include geo-tagged photographs of the existing cross drainage structures, measurement of structure sizes; evaluation of structural condition, general soil evaluation and land use in the area. In case there is track alignment, all possible locations of water crossings will be identified with water marks and width of waterway.

b. Meteorological Analysis

The meteorological analysis will be based on maximum available record (preferably more than 30 years) from all the surrounding observatories. The analysis must include: -

- Review and analysis of historic Rainfall and Peak Storm events.
- Use of statistical methods to evaluate meteorological and hydrometric records and determining best data best fitting on either of Gumbel Max, Weibull or Log Pearson 3 distributions.
- Calculation of return periods for 25 years, 50 years, 100 years.
- Instead of using meteorological station data far away from the road, the consultant will
- use spatial analysis (for meteorological models) for finding out design storm value in
- the study area / watershed derived from the surrounding observatories.
- Selecting and calculating design storm for hydrological model

c. Watershed Delineation

The activity includes delineation of watershed affecting road and evaluating physiography and topography of the catchment / watershed-area. The watershed delineation will be carried out using industry standard tools e.g. Arc Hydro, Topaz, WMS and DHI MIKE suite etc. The digital elevation model (DEM) for watershed delineation will be of at least 30-meter resolution or better. Satellite imagery and any available topographic survey will be used for stream / river correction in the DEM.

d. Soil and Land Use

The hydrological soil type and land use will be assessed in the catchment to evaluate Loss, routing and roughness. The hydrological soil type and land use may be marked using satellite imagery and classification methods available in GIS with spot site verification.

e. Surface Runoff Model

The surface runoff for all ungauged basins will be calculated using tools like "Hydrological Modeling System" (HEC-HMS) and Watershed Modeling System (WMS) for large basins and for small TR-20 can be used. The model will be prepared using GIS techniques / software like HEC-Geo HMS and WMS etc. The preparation will include complete sub-basin characterization like basin area, slope, roughness and lag-time etc. The preferred method is as follows:

- Land use marked according to Anderson method / Land use type
- Loss Method = SCS Curve No.



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- Roughness = Manning's "n"
- Transform SCS Unit Hydrograph
- CN curve numbers estimated from Land use
- Muskingum-Cunge or dynamic for routing
- Streams sections estimated from DEM

The hydrological model will be integrated into hydraulic model based on field survey and judgment, stream and cross drainage structures identification through imagery and marking streams through GIS methods.

The consultant may also take into consideration future catchment changes likely to influence flooding risk.

f. Hydraulic Analysis

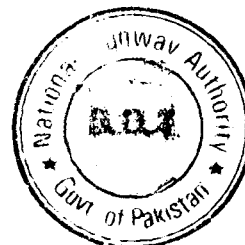
The calculated storm flows will be modeled through or around road structures using 1D models like HEC-RAS, HY-8, MIKE 11 and SWMM. The culverts in general will be designed using HY-8 based on data prepared through "Watershed Modeling System" and field survey. The bridges and mapping of flood plains will be carried out through 1D hydraulic models like HEC-RAS or MIKE11. The hydraulic model will be prepared using GIS techniques like HEC-Geo RAS, WMS or MIKE11. The hydraulic model results will be used for assessment of flood impact and analysis of alternatives for its mitigation. The hydraulic structures will be designed taking into account standard design criteria for highways.

Design/AEP	Design/AEP					Check Flood
	50% (2-yr)	20% (5-yr)	10% (10-yr)	4% (25-yr)	2% (50-yr)	1% (100-yr)
Freeways (main lanes):						
Culverts					•	•
Bridges ⁺					•	•
Principal arterials:						
Culverts			•	•	•	•
Small bridges ⁺			•	•	•	•
Major river crossings ⁺					•	•
Minor arterials and collectors (including frontage roads):						
Culverts		•	•	•		•
Small bridges ⁺			•	•	•	•
Major river crossings ⁺				•	•	•
Storm drain systems on controlled access highways (main lanes):						
Inlets, drain pipe, and roadside ditches			•			
Inlets for depressed roadways*					•	
Storm drain systems on other highways and frontage roads:						
Inlets, drain pipe, and roadside ditches	•	•	•			
Inlets for depressed roadways*				•	•	

+ The 0.5% (200-yr) and 0.2% (500-yr) AEP events should be calculated for scour computations.

All structures must be evaluated to the 1% Annual Exceedance Probability (AEP) flood event or 100yr return period. Selecting a design flood is a matter of judgment; it requires balancing the flood risk with budgetary constraints;

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therefore, the consultant is required to submit its proposal take approval from National Highway Authority. The designer should design a facility that will operate:

- Efficiently for floods smaller than the design flood.
- Adequately for the design flood.
- Acceptably for greater floods.

Deliverable:

As required under "Sequence of Activities", **Preliminary Hydrology & Hydraulic Study Report** will be submitted under Stage-II.

Detailed Hydrology & Hydraulic Study Report will be submitted under Stage-III. The report must be self-explanatory in nature and organized in an intelligible manner. Each & every page of the report must be signed by the concerned specialist/expert and stamped by consulting firm. The report must include but not necessarily limited to the following: -

- a. Executive Summary.
- b. Reconnaissance survey report.
- c. Detailed flowchart of whole analysis process along with description of tools used at different stages. The flowchart must be supported by comprehensive explanation.
- d. Geo-tagged pictures marked on satellite imagery with respect to attachments.
- e. Detail watershed delineation and analysis.
- f. Meteorological analysis.
- g. Soil and land use classification.
- h. Surface runoff model results.
- i. 1D hydraulic model results for design.
- j. Hydraulic design of structures.
- k. Embankment height according to HFL.
- l. Design of river training works (if required)

The Consultant is required to take into account the Breaching Sections of Ravi River/ Shahdara while performing Hydrology Study.

6.7. PRELIMINARY DESIGN DRAWINGS & ENGINEER'S ESTIMATE

Preliminary design drawings & engineer's estimate will be developed with reasonable curacy in order to be used as a basis for development of preliminary technical feasibility report.

6.8. PRELIMINARY TECHNICAL FEASIBILITY REPORT

A preliminary technical feasibility report based on preliminary design drawings & engineer's estimate etc. will be prepared and submitted in order to establish the feasibility of the project from technical standpoint.

6.9. SOIL & MATERIAL INVESTIGATION

Soil & Material investigation shall be done to ascertain the index and engineering properties of encountered soil. The consultant is required to seek, interpret and



evaluate subsurface and surface data, in order to predict the behavior of the soils and materials along and adjacent to the alignment. The resulting information should be presented in a logical and intelligible manner so that it can be used correctly and efficiently by the non-specialist. As per fixed horizontal and vertical alignment, identify the areas of deep cuts and high fills. Study precise geometry of the roadway structures and develop design requirements. Field investigations shall be carried out in three main areas:

- Investigation along the length of the proposed alignment and to determine the pavement support potential offered by the subgrade soils.
- Investigation to determine the source and quantity of naturally occurring construction materials.
- Examine specific sites such as deep cuts, retaining walls and culverts etc.

Following table presents the guidelines for the quantity of roadway pits or borings and required testing. The values given are tentative investigation requirements and the actual scope will depend upon whether preliminary or detailed investigations are required.

Roadway type	Height (m)	Terrain type	Spacing (m)	Depth (m)
Embankment	<2	Uniform	1000	1.0
		Rolling	500	
		Hilly	250	
	2-10	Uniform	500	1/3 of embankment of refusal
		Rolling	400	
		Hilly	200	
>10	Uniform	600	2/3 of embankment of refusal	
	Rolling	300		
	Hilly	150		
Cut	<2	Uniform	1000	1.0 below subgrade
		Rolling	500	
		Hilly	250	
	2-10	Uniform	800	1.0 below subgrade
		Rolling	400	
		Hilly	200	
>10	Uniform	600	1.0 below subgrade	
	Rolling	300		
	Hilly	150		

Tentative guidelines for testing requirements are given below:

Test	TEST REQUIREMENT		FREQUENCY	
	EMBANKMENT	SUBGRADE	ALIGNMENT	BORROW AREA
Gradation	•	•	1 per km	1 per boring/ pit
Moisture Content	•	•	1 per km	1 per boring/ pit
Classification	•	•	1 per km	1 per boring/ pit



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Moisture Density	•	•	2 per 5 km	1 per borrow area
CBR	-	•	1 per 1 km	1 per borrow area

For testing of materials, following codes and standards shall be followed:

- a. ASTM - American Society for Testing & Materials.
- b. AASHTO - American Association of State Highway and Transportation Officials.

6.9.1. Material Investigation

Every effort should be made to locate sufficient quantities of naturally occurring construction materials at regular intervals along the alignment and as close to the alignment as possible. In case of potential quarry sites, test borings are likely to be necessary to confirm the quantity and quality of material available. Bulk samples for quality testing may be obtained from adjoining bedrock outcrops provided that the samples obtained from such sources are truly representative. Test results from any nearby operational quarries should also be included.

Guidelines for testing requirements of materials are as following: -

Test	Test Requirement					Water
	Fine Aggregate		Coarse Aggregate			
	Asphalt Concrete	P.C. Concrete	Subbase / Base	Asphalt Concrete	P.C. Concrete	
Gradation	•	•	•	•	•	
Atterberg Limits	•		•	•		
Sulphate Soundness	•	•	•	•	•	
Loss by Abrasion			•	•	•	
Organic Impurities		•				
Sand Equivalent		•	•	•		
Soluble Sulphates		•			•	
Soluble Chlorides		•			•	
Friable Particles		•	•	•	•	
Thin & Elongated Particles			•	•	•	
Fineness Modulus		•		•		
Water Quality						•
Marshall Test				•		
Stripping Test				•		



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Water is required for proper compaction of earthworks, and water points will be necessary at frequent intervals along the alignment. An assessment should be made of the likely sources of water from any existing wells and from the geological formations underlying the route. Samples for tests to assess the suitability of water for concrete will be necessary.

6.9.2. Soil Classification

Soil description is necessary for all test pits and boring logs. The descriptions should be standardized so that the main characteristics are given in the same order i.e. *Mass Characteristics* shall include field strength, moisture content, bedding state if applicable discontinuities and state of weathering. *Material Characteristics* shall cover colour, composition, and grading. Particle shape, soil name and soil group. Both Unified and AASHTO classification shall be used.

Deliverable: As required under "Sequence of Activities", **Preliminary Soil & Material Investigation Report** will be submitted under Stage-II.

Detailed Soil & Material Investigation Report will be submitted under Stage-III.

6.10. GEOTECHNICAL INVESTIGATION FOR STRUCTURES

The design consultant shall submit a tentative sub-surface investigation plan to NHA based

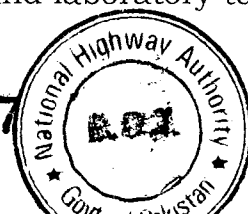
on reconnaissance survey suggesting a total number of bore holes, depth of each bore hole (based on geological formation at site & the type of foundations proposed for the structures) and a list of proposed tests based on available data and prevailing site conditions to get approval from NHA before carrying out detailed geotechnical investigation.

After the formulation of tentative scope of work for sub-surface investigations and subsequent approval of NHA, if the consultant is deficient in the expertise to perform Geotechnical Investigations on its own then a registered Geotechnical firm(s)/ company(s) shall be called by the consultant for nomination of specialist contractor subjected to approval of General Manager (Design).

Work shall commence on site based upon a formal agreement between the consultant and nominated specialist contractor (including quantities, rates, work schedule and ToR). NHA will pay a lump sum amount to the consultant as the fee for this work on submission of invoice by the consultant. Consultant will supervise the sub-surface investigation work to be carried out at site by the nominated specialist contractor and certify the supervision of work by a qualified geotechnical engineer. Consultant will be responsible for the quality and accuracy at site.

The nominated specialist contractor shall carry out the Standard Penetration Test (SPT), Cone Penetration Test (CPT) or any other test deemed necessary based on underlying soil strata as per approved plan.

Sub-surface investigations consisting of boreholes / drill holes / test pits of required depth, supplemented by field and laboratory testing to accurately assess



the engineering properties of the underlying soil strata for detailed design of foundations, substructures and roads shall be undertaken satisfying design requirements. Testing of samples collected from site shall be carried out in a reputed laboratory, under strict quality control and adherence to relevant ASTM procedures / standards.

A separate report will be prepared to this effect and will be submitted to NHA for approval. Bore logs along with original lab reports shall be attached in the soil report along with colored photographs.

Deliverable: A comprehensive **Geotechnical Investigation Report** will be submitted to NHA. Bore logs along with original lab reports shall be attached in the soil report along with colored photographs.

6.11. **CONDITION SURVEY REPORT**

The consultant will evaluate the condition of existing structures. Relevant international standards should be used in conducting survey and subsequently formulating the Report. The consultant shall also include the functional & structural evaluation of existing pavement in Condition Survey Report. For functional evaluation, the present IRI (If required), Condition Survey along-with photographs shall also be reported. For structural evaluation, destructive and nondestructive testing will be carried out. For structure capacity evaluation, based on FWD/HWD data, project level analysis shall be carried out by Consultant. The FWD/HWD equipment shall be arranged by the Consultant. Consultant will analyse the data based on unit delineation and procedures as per AASHTO 1993 guidelines, accordingly homogenous sections shall be developed. Consultant shall also develop a destructive testing program to obtain in-situ pavement parameters like, compaction, moisture density, gradation, insitu-CBR and layer thicknesses of underlying layers. With all the collected data, back calculation exercise shall be done to work out residual strength, to be used in the pavement rehabilitation design. Based on functional and structural evaluation of existing pavement consultant will develop pavement rehabilitation design.

Deliverable: A comprehensive Condition Survey Report will be submitted along with clear-cut recommendations regarding retention / improvement / new construction etc. of pavement and structures.

6.12. **ENVIRONMENTAL IMPACT ASSESSMENT**

Detailed ToR for EIA study is provided in a separate Chapter.

6.13. **DESIGN REPORT**

The consultant will prepare and submit a comprehensive Design Report including, but not limited to, geometric design, pavement design, structural design etc.

6.13.1. **Geometric Design**

The geometric design will be carried out by the consultant followed by preparation of plan & profile drawings. The drawings will become a part of Design Drawings. A comprehensive Geometric Design Report will be submitted.



Geometric improvement of the existing road/alignment (if applicable) will also be considered.

6.13.2. Pavement Design

Consultant will submit Pavement Design Report complete in all respect based on Soil investigation /material characterization on the finalized alignment and finalized traffic & Axle Load study. The Pavement Design Report will include / contain all necessary soil material investigation tests and complete process of ESALs determination starting from AADT. All typical pavement cross-sections clearly elaborating all details will also be made part of pavement design report. In addition, the consultant will provide the details of Embankment Design as well as drainage design.

Pavement will be designed for a period of 10 years design life. In addition, overlay design for other 10 years or for remaining numbers of year to cover complete concession period will also be provided. In this regard, Design Consultant will also submit suitable assumptions used for the overlay design. Each input to design should be duly calculated/justified through proper referencing in the Report. The pavement design shall be carried out by the consultant on the basis of AASHTO Guide for Design of Pavement Structure-1993. In this regard, pavement type selection process of AASHTO Pavement Design Guide-1993 shall also be followed. In addition, pavement design shall also be validated through Mechanistic-Empirical approach using KENPAVE software. Shell Model shall be used under KENLAYER analysis. All calculations shall be attached in the report in hard and provided in soft (editable) form as well. Relevant drawings in this regard will become a part of Design Drawings. Axle Load data and tyre pressure data to be collected and Kenlayer analysis software shall be used. All calculations shall be attached with the report.

6.13.3. Structural Design

Design of structures will be carried out by following the design codes & standards specified in earlier section of the TOR, followed by preparation of Structural Drawings. These drawings will become a part of Design Drawings.

6.13.4. Design Drawings

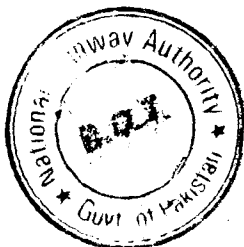
The consultant will prepare and submit Design Drawings. The Drawings will include at least, but not necessarily limited to, the following details: -

- Title Sheet.
- Index Sheet.
- Project summary sheet(s) wherein project will be explained in appropriate detail to
- provide at a single place all the salient features of project.
- General notes.
- QC sheet wherein full names, designations, and full signatures of designer, reviewer, draftsman etc. will be shown.



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- Legends & Symbols Sheet.
- Key & Location Plans with Coordinates and alignment with stationing.
- Location plan showing/demonstrating existing number of lanes (if applicable) and right of way along the project length.
- Location plan showing/demonstrating proposed number of lanes and right of way along the project length.
- Soil investigation linear plan. Pits of soil investigations will also be marked.
- A plan showing major quarry sites/ borrow area sites including mass haul diagram showing cut and fill along the alignment.
- Design criteria, codes, and standards.
- Traverse data, Bench Mark data, Setting out data, Super elevation data, and Design alignment data including curve data.
- Typical Cross-Sections with locations of applications showing Pavement Design for main carriageway, interchanges, and toll plaza (if any) approach roads, and road network (if any) within service areas.
- Design along with proposed locations of toll plazas, bus bays, weigh stations etc. Number of toll lanes/toll booth facilities are to be designed based on queue length analysis.
- Cross-sections generated at an interval not exceeding 50m.
- Super-elevation details and Linear Plan.
- Road Furniture (Guard rails, Pavement Marking plans & details thereof, Traffic signage plans & details thereof as per MUTCD & NTRC etc). Proposed Location of traffic signs and gantries etc., along the alignment must be shown on the drawings.
- Retaining walls (if any) with location tables.
- Intersection & Interchanges Details. Number of lanes on exit/entrance ramps should be based on proper capacity analysis, preferably for minimum 20 years.
- Drainage plan for surface runoff and urban areas.
- Plan and Profile Drawings.
- Structural Drawings for: new structures and, if applicable, old/existing structures requiring rehabilitation/reconstruction etc.
- Proposed Landscaping & Horticulture as per best international practices and experience on similar projects, wherever required.
- Roadside Design.
- Proposed Design for Lighting as per best international practices with tailoring considerations to suit local conditions.
- Highway Drainage design.
- Requirement of Traffic Control Devices, Work Zone Safety, and "Maintenance & Protection of Traffic (MPT) Plans". MPT shall be for the following situations: -
 - a) Where any existing road intersection will be affected during project execution.



- b) In urban areas including methodology for separating the local and through traffic.
- c) At places where underground construction like construction of box culverts and underpasses is involved.
- d) At places where overhead bridge construction is proposed.
 - Design of all facilities for NH&MP e.g. construction of buildings etc. as per their requirements. The consultant will seek input of NH&MP and NHA on this aspect through close coordination and accordingly propose facilities.
 - Detailed design of tunnel(s) (if any)
 - Design of pedestrian overhead bridges (if any)
 - Design for provision of ducts/crossing of future utilities like OFC, pipelines etc.
 - Design along with location tables of U-turns, side drains, service road, median barrier, as per international standards and best safety practices.
 - Detail of design exceptions, assessment of risks associated with exceptions, and risk management measures.
 - Occupational safety and health measures as per international standards and best safety practices.
 - Proposed design and linear plan of anti-glare screens, if median barrier is proposed.
 - Landslide and Slope stabilization measures.

6.14. LAND ACQUISITION AND UTILITY INFRASTRUCTURE REPORT

The consultant will identify, take photographs, and then digitize land, properties, trees, utilities, existing roads etc. falling in right of way (ROW). The consultant will prepare Land Acquisition & Utility Folders wherein following items must be indicated:

- Exact width of existing/present ROW/road, must be shown in the folder.
- Detail of Structures with type, exact measurement along with exact chainage indicating its location with respect to centre line of new proposed road.
- Detail of trees with kind must be explicitly indicated in the folder along with girth and
- number of each type. Exact chainage and location with respect to centre line of new proposed road.
- Permanent point like Railway Line etc. or permanent schools and others Government buildings must be shown, as per detail above, giving type of structures and its condition.
- Settled populations, Graveyards, Mosques, Khanqah, Shrines or any other religious site
- may preferably be avoided.
- Graveyards, Mosques, Khanqah etc. and any other religious site must be explicitly indicated in the folder.
- Chainage /Kilometer wise name of villages /Towns /cities, where alignment passes must be indicated in the folder.

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- Bridges, Culverts, Rain water channels existing on present/ existing/ proposed road must be shown in the Folder.
- Complete detail of Private and Government land falling in the proposed alignment must
- be shown in the folder by giving its Mouza name & number in which the land is acquired.
- Coordination/Consultation with NHA regional land Staff (if any) during survey for alignment of Road/Row & Bypasses for preparation of land acquisition folder and certificate in this regard should be furnished that land acquisition folder has been prepared in coordination with concerned regional staff / field formations.

6.15. ROAD SAFETY AUDIT REPORT

Road safety is recognized as a major socioeconomic concern facing the Asia and Pacific region. NHA is committed to perpetually and continuously improve safety on National Highways and Motorways network through conscious endeavors. As a part of this endeavor, Road Safety Audit (RSA) of final design will be carried out by a subject matter expert/specialist having Certification as Road Safety Auditor from an international organization.

The expert will carry out detailed review of safety aspects of design by conducting RSA as per international standards and/or requirements of NHA. Formal RSA Report shall be submitted upon completion of the audit, duly signed by the Expert. Use of statistical analysis techniques should also be given consideration. Formal/Informal feedback from relevant stakeholders should also be made part of the Report.

6.16. CONSTRUCTION MACHINERY REPORT

A report on construction resources will be prepared. It will include, based on the construction duration, the amount and type of construction machinery required. Based on the construction plan (to be duly provided in the Report) developed in a Project Scheduling Tool like Primavera/Microsoft Project etc., the resource allocation and cash flow requirements will be stated. Computations and assumptions for productions will be made a part of the report. The requirement of any equipment to be imported will also be indicated.

6.17. ENGINEER'S ESTIMATE

Consultant will prepare Engineer's Estimate of project to reasonable accuracy by using latest Composite Schedule of Rates. For items not specified in NHA CSR, rate analysis will be provided based upon market price. The consultant will be required to submit the take-off sheets in soft format (Microsoft Excel) along with Engineer's Estimate. The consultant will also be required to submit a certificate, as per format desired by NHA, wherein amount of estimate, basis of estimate, and accuracy level thereof etc. will be clearly indicated.

6.18. FINAL TECHNICAL FEASIBILITY REPORT



Consultant will prepare and submit comprehensive and self-explanatory final technical feasibility report on the basis of surveys, studies, investigations, final design, and estimates etc. described in earlier sections of the ToR.

6.19. GROUND VALIDATION & ALIGNMENT STAKEOUT

If required/instructed by NHA, the Consultant will carry out ground validation and stakeout the alignment on ground. The centerline markers shall be fixed on ground at 100m interval. A 1.5m long bamboo stick with orange cloth 1m x 0.5m shall be fixed at each point. The stake out may be checked by representative(s) of NHA. A detailed report with photographs shall be submitted by consultant.

6.20. FINAL PRESENTATION

The Consultant will give presentation on the project as, when, and where required/directed by NHA. The presentation should include but not limited to following details.

Important Features of Presentation:

- Description of road alignment.
- Description of design criteria and functional requirements.
- Important components of project like major bridges, flyovers etc.
- Important parameters of sub-soil investigation like CBR, Pile Capacity and General Soil Classification etc.
- Important hydraulic parameters used in the design of bridges over rivers/canals.
- Results of traffic studies.
- Location of quarry sites.
- Traffic management plans.
- Description of specialized equipment and machinery required for the construction.
- Description of methodology and codes for design including details of computer models.
- A plan showing major quarry sites / borrow area sites including mass diagram showing cut and full along the alignment will be presented.
- Any other points, which the consultant may like to highlight, should be included.

The consultant will also be required to give a separate presentation to Design Section on methodology, tools, software, and techniques etc. used in, including but not limited to, Topographic Surveying, Traffic studies, Pavement Design, Geometric Design etc.

6.21. SUBMISSION OF DELIVERABLES

The following requirements should be fulfilled by the consultant: -

- All submissions should be signed & stamped.
- All pages/sheets must be properly numbered with complete project name indicated in header/footer/sidebar.



- After finalization of draft submissions in the light of review comments (if any three(03) hard copies of final version of each deliverable will be submitted to NHA alongwith soft copy (Portable Document Format as well as editable document format e.g. MSWord, MS Excel, Civil 3D format etc) except PC-I and EIA Study for which requisite number of copies will be submitted as per requirement of concerned sections of NHA.
- Provision of soft copies in editable format will be a mandatory requirement failing which contract close-out will remain in abeyance.
- If requested by NHA, Consultant will provide two additional sets of all documents/reports at a later stage at no extra cost.

6.22. REVIEW OF DOCUMENTS

Consultant will give consideration to review comments/observations of NHA (if any); however, any review or no review at all will not be construed to absolve the consultant from contractual responsibility for correctness, safety, soundness, and economy etc. of design including Engineer's Estimate, and all other services carried out under this contract.

6.23. PERFORMANCE RATING

Performance of the consultant may be evaluated by NHA on basis of multiple factors including but not necessarily limited to quality of submissions, compliance with TOR requirements & instructions of NHA, responsiveness, timeliness, diligence, efficiency, consideration of economy, management of scope, schedule, cost, resources, and risks, and above all the level of faithfulness as an adviser. Performance rating will broadly be made in the following manner:

Rating	Description
A+	Excellent
A	Good
B	Requiring improvement
Poor	Poor

NHA reserves the right to develop a breakdown/matrix for implementing above mentioned ratings. In addition to this, it is highlighted that NHA Code (Revised 2005) authorizes NHA to exercise appropriate actions against consultant in case of errors in design.

6.24. FUTURE ASSISTANCE

The consultant will be required to provide professional assistance in future in addressing any audit observations, inquiries, investigations, litigation, or any other reasonable requirement related to the services carried out and solutions proposed under this ToR.

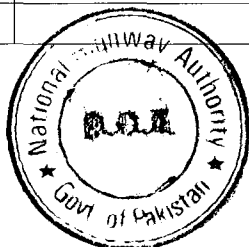


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6.25. MODE OF PAYMENT:

Sr. No.	DESCRIPTION	Percentage of "A"
		("A" to be calculated by excluding PS and LS items hereunder)
STAGE-I		
1	Inception Report for Technical Feasibility	4%
2	Inception/ Outline Report for Commercial Feasibility	4%
3	Alignment Study Report along with KMZ/KML file	4%
	<i>Sub-Total (1)</i>	12%
STAGE-II		
4	Preliminary Topographic Survey Report along with Plans	LS
5	Traffic Survey Report	LS
6	Axle Load Survey Report	LS
7	Preliminary Hydrology & Hydraulic Study Report	LS
8	Preliminary Soil & Material Investigation Report	LS
9	Preliminary Design Drawings and Engineer's Estimate	4%
10	Preliminary Technical Feasibility Report	4%
11	Preliminary Commercial Feasibility Report	4%
	<i>Sub-Total (2)</i>	12%
STAGE-III		
12	Detailed Topographic Survey Report along with Plans	LS
13	Detailed Hydrology & Hydraulic Study Report	LS
14	Detailed Soil & Material Investigation Report	LS
15	Geotechnical Investigation Report	PS
16	Condition Survey Report	2%
17	Environmental Impact Assessment (EIA) Report	LS
18	Design Report	8%
19	Final Design Drawings	8%
20	Land Acquisition & Utilities Folders	4%
21	Road Safety Audit Reports	LS
22	Construction Machinery Report	2%
23	Engineer's Estimate	4%
24	Final Technical Feasibility Report	12%
25	Final Commercial Feasibility Report	12%
26	Ground Validation & Alignment Stakeout (if required)	4%
27	PC-I (Project Cost including Viability Gap Funding)	4%
28	PC-I (Land)	4%
29	RFP Document including Model Concession Agreement	12%
	<i>Sub-Total (3)</i>	76%
	TOTAL (1+2+3)	100%



Notes Regarding Payment:

- I. Any deliverable reflected in ToR but not mentioned in the mode of payment or vice versa will be duly submitted without failure.
- II. A checklist will be attached by the consultant with each deliverable which should correlate the deliverable to requirements spelled out in ToR. Depending upon quality of the deliverable and responsiveness to the ToR, up to 50% payment may initially be released by NHA.
- III. Remaining/Final payment against any deliverable shall only be released when the final deliverable is of acceptable quality and completely responsive to ToR; comments (if any) of NHA have been appropriately responded by consultant; and hard copies of final deliverable are submitted in requisite quantity along with soft copies (Portable Document Format as well as editable document format e.g. MS Word, MS Excel, Civil 3D format etc).
- IV. If final deliverable/report is not completely responsive to ToR and/or has quality issues, then penalty will be imposed by deducting partial or full payment against the report/deliverable besides adverse performance rating of consultant.
- V. Payment against Provisional Sum will be as per actual expenditure. Detail/Proof of the expenditure will be submitted along with the corresponding Invoice(s).
- VI. All reports will be submitted in original to GM(Design). The consultant will be required to appropriately address and respond to the comments/feedback of NHA. All submissions should be signed & stamped. All pages/sheets must be properly numbered with complete project name indicated in header/footer/sidebar.

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6.26 MANPOWER REQUIREMENTS

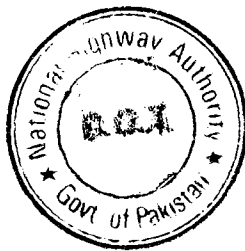
Sr. No.	Key/ Proposed Staff Position	No. of Persons	Individual Man Months	Total Man Months
A. Professional/ Key Staff				
1	Team Leader/ Senior Structural Engineer	1	4 + 1	5
2	Senior Highway Engineer	1	3 + 1	4
3	Junior Structure/ Bridge Engineer	2	3	6
4	Junior Highway Engineer	1	3	3
5	Pavement Design Engineer	1	1 + 1	2
6	Transport Economist	1	1	1
7	PPP Expert/ Financial Expert	1	3	3
8	Corporate Law Expert	1	3	3
9	Quantity Surveyor	1	2 + 1	3
10	CAD Operator	2	2	4
	Sub Total (A)	12		34
B. Non Key/ Support Staff				
1	Computer Operator	4	4 + 1	20
2	Office Boy	3	4	12
	Sub Total (B)	7		32
	Total (A+B)	19		66



TORs for:

COMMERCIAL FEASIBILITY

Construction of Shahdara Flyover Bridge



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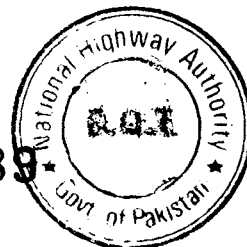
1. INTRODUCTION

NHA intends to construct the Shahdara Flyover Bridge on N-5 passing through the congested city of Shahdara, Lahore. The project is reflected in PSDP 2019-20 on BOT basis.

2. PRINCIPAL ACTIVITIES

The following principal activities are identified that need to be carried out, but it should not be construed as the total set of activities required for the successful completion of tasks specified in the present TOR:

- Kick-off Meetings
- Stakeholder Analysis
- Stakeholder Meeting
- Collection and Review of available Data
- Defining project Need, Objectives and Scope
- Need Analysis
- Analysis of project framework conditions
- Outlining possible financing options
- PPP options identification/analysis
- Project outline: business case
- Review of Legal Framework
- For the Project Structuring NHA will provide land free of cost and encumbrances. However, title of the land shall remain with NHA.
- CAPEX (Capital Expenditure) Analysis
- Defining Toll Rate Structure and System in harmony with existing road network.
- OPEX (Operation Expenditures) Analysis
- Routine and Periodic Maintenance Forecasting
- Toll Level Projections
- Other Sources of Revenue identification
- Possible Government Support mechanism, options
- Country Economic and Inflation Analysis
- Revenue Analysis & Forecasting
- Debt Servicing and Amortization Scheduling for different possible Debt Financing Options
- Project Risk Identification and Allocation
- Inflation and Lending Market Analysis
- PPP Modeling Base Case
- Viability Gap Analysis
- Financial Analysis & Bankability
- Evaluation of the variations (different project structuring options such as: private sector participation on BOT, BT and Hybrid mode
- Prepare Commercial Feasibility Report including Financial Model demonstrating the Project viability, bankability and affordability
- Sensitivity Analysis
- Conclusion & Recommendation



- Define procurement strategy
- Advising and Outlining Way Forward
- Project Information Memorandum
- Develop project implementation and timeline plan.
- The Consultant will provide necessary coordination and help NHA for conducting road shows for the subject project.
- Draft Commercial Feasibility Report
- Final Commercial Feasibility Report
- Other Reports shall include:
 - RFP including Model Concession Agreement with Project Scope (including Intelligent Transport System (ITS), Design Standards, Specifications, Performance and Operation Standards.
 - The consultant shall also help NHA on Technical Design matters of the project during Pre-Bid meeting and technical Bid Evaluation stage.

3. **TIME DURATION FOR THE ASSIGNMENT**

The services specified in the TOR shall be completed and all relevant reports submitted in the form and format acceptable to the Client, within **Four (04) Months** from the date of Commencement of Consultancy Services. Another **One (01) Month** period shall be required for relevant experts, so as to help NHA on Technical Design matters and assistance in Technical Bid Evaluation.

4. **DELIVERABLES**

The consultant shall submit following reports/submissions:

- Inception/Outline Report
- Commercial Feasibility - Draft Report
 - Traffic Study Report
 - Financial Model
- Presentation (on appointment/availability)
- Commercial Feasibility - Final Report
- RFP Document including Model Concession Agreement
- Technical Bid Comparative Evaluation Report



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MINIMUM KEY PERSONNEL PROPOSED BY THE CLIENT

Sr. No.	Position	Nos.	Months	Person-Months
1.	PPP Expert/ Financial Expert	1	3	3
2.	Corporate Law Expert	1	3	3



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