



NATIONAL HIGHWAY AUTHORITY

Procurement & Contract Administration Section

28 Mauve Area, G-9/I, Islamabad ☎ 051-9032727, 📠 051-9260419

No. 6(481-B)/DIR-III(P&CA)/NHA/19/125

¹¹
17 April, 2019

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 Detailed Design, Traffic Studies,
Commercial Feasibility Study and Bid Evaluation/ Bid
Comparative Analysis for Hyderabad - Sukkur Motorway
Project on Built-Operate-Transfer (BOT) Basis under Public
Private Partnership (PPP) Arrangement**

Reference: *PPRA Rule-35*

Kindly find attached the duly filled and signed Evaluation Report along with Bid Evaluation Criteria (Annex-I) pertaining to the procurement of subject Services in view of above referred PPRA Rule-35 for uploading on PPRA website at the earliest, please.


(Muhammad Azam)
Director(P&CA)

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

Copy for kind information to:

- Member (Planning), NHA, Islamabad;
- General Manager (P&CA), NHA, Islamabad;
- S.O. (Tech.) to Chairman, 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 Detailed Design, Traffic Studies, Commercial Feasibility Study and Bid Evaluation/ Bid Comparative Analysis for Hyderabad – Sukkur Motorway Project on Built-Operate-Transfer (BOT) Basis under Public Private Partnership (PPP) Arrangement
4.	Tender Inquiry No.:	6(481-B)
5.	PPRA Ref. No. (TSE):	TS372412E
6.	Date & Time of Bid Closing:	12 th December, 2018 at 1130 hours local time
7.	Date & Time of Bid Opening:	12 th December, 2018 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 National Engineering Services Pakistan (Pvt.) Ltd., in JV with M/s ZAK Consulting Engineers (Pvt.) Ltd., and in association with Sub-Consultants: M/s KPMG Taseer Hadi & Co. and M/s Axis Law Chambers	634	177	811	52,739,640	Top scoring firm in combined evaluation (PPRA Rule 36(b) (ix))
2) M/s PEAS Consulting (Pvt.) Ltd. in JV with M/s ESS-I-AAR, M/s Exponent Engineers (Pvt.) Ltd. and M/s Assign Engineering Consult International (Pvt.) Ltd.	572	200	772	46,646,552	2 nd

Hajji Tahir

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)		
3) M/s Finite Engineering (Pvt.) Ltd., in JV with M/s HA Consulting Pakistan	590	119	709	78,574,545	3 rd
4) M/s Directorate of Design & Consultancy (DD&C) with Sub-Consultants: M/s EY Ford Rhodes and M/s Haidermota BNR	543	Financial Proposal not opened			PPRA Rule 36(b) (v)
5) M/s Associated Consultancy Centre (Pvt.) Ltd. in JV with M/s Associated Consulting Engineers (Pvt.) Ltd. and M/s PAVRON		Financial Proposal not opened			1. Conflict of Interest, Sub-Clause 1.9 of Instructions to Consultants of Request for Proposal through technical evaluation not considered. 2. 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 National Engineering Services Pakistan (Pvt.) Ltd., in JV with M/s ZAK Consulting Engineers (Pvt.) Ltd., and in association with Sub-Consultants: M/s KPMG Taseer Hadi & Co. and M/s Axis Law Chambers

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.

Signature:.....  17/4/19
 General Manager (P&CA)
 National Highway Authority
 Official Stamp:.....
 Islamabad

****Standard Bidding Documents (SBD).**

National Highway Authority



Annex-I

Criteria

FOR

Bid Evaluation

**Consultancy Services for Detailed Design,
Traffic Studies, Commercial Feasibility
Study and Bid Evaluation/ Bid Comparative
Analysis for Hyderabad – Sukkur Motorway
Project on Built-Operate-Transfer (BOT)
Basis under Public Private Partnership (PPP)
Arrangement**

April, 2019



NATIONAL HIGHWAY AUTHORITY

Procurement & Contract Administration Section
28-Mauve Area, G-9/1, Islamabad Tel: 9032727, Fax: 9260419

Ref: 6(481-B)/DIR-III(P&CA)/NHA/2018/461

5th December, 2018


All Prospective Consultants

Subject: **MINUTES OF PRE-PROPOSAL MEETING:**

Consultancy Services for Detailed Design, Traffic Studies, Commercial Feasibility Study and Bid Evaluation/ Bid Comparative Analysis for Hyderabad – Sukkur Motorway Project on Built-Operate-Transfer (BOT) Basis under Public Private Partnership (PPP) Arrangement

Reference: Request for Proposal Notice for subject Services appeared in daily newspapers on 20th November, 2018

The Minutes of Pre-Proposal Meeting held on 27th November, 2018 for subject Services being integral part of the Request for Proposal are enclosed herewith for necessary action, please.


(MUHAMMAD AZAM)
Director (P&CA)

Enclosure:

- **Minutes of Pre-Proposal Meeting (01 Page).**

Copy for kind information to:

- Member (Engg. Coord.), NHA, Islamabad;
- Member (Planning), NHA, Islamabad;
- General Manager (P&CA), NHA, Islamabad;
- General Manager (Planning), NHA, Islamabad;
- General Manager (PPP), NHA, Islamabad;
- General Manager (Design), NHA, Islamabad.

MINUTES OF PRE-PROPOSAL
MEETING HELD ON 27th NOVEMBER 2018

Consultancy Services for Detailed Design, Traffic Studies, Commercial Feasibility Study and Bid Evaluation/ Bid Comparative Analysis for Hyderabad – Sukkur Motorway Project on Built-Operate-Transfer (BOT) Basis under Public Private Partnership (PPP) Arrangement

A Pre-Proposal Meeting was held in NHA Auditorium at 1100 hours on 27th November, 2018 to discuss the Request for Proposal (RFP) for subject Services. Following NHA officers and representatives of prospective consultants attended the meeting:

▪ **National Highway Authority**

- | | | |
|---------------------------|-----|-----------------------------|
| ➤ Mr. Parkash | ... | General Manager (Planning) |
| ➤ Mr. Zulfiqar Ali Janjua | ... | General Manager (Design) |
| ➤ Mr. Ijaz Ahmed | ... | Director (PPP) |
| ➤ Mr. Muhammad Azam | ... | Director (P&CA) – III |
| ➤ Mr. Dawood Khan | ... | Deputy Director (P&CA) – II |

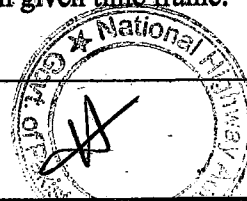
▪ **Consultants**

- | | | |
|--------------------------|-----|--|
| ➤ Mr. Omair Riaz | ... | BD Manager, M/s MM Pakistan |
| ➤ Mr. Shahzad | ... | Business Associates, M/s IQ Capital Plus |
| ➤ Dr. Waseem Kiani | ... | Team Leader, M/s DD&C |
| ➤ Mr. Sohail Malik | ... | Coordinator, M/s DD&C |
| ➤ Mr. Fazal Safi | ... | Design Engineer, , M/s ECSP, Lahore |
| ➤ Mr. Naeem Mehmood Khan | ... | GM, M/s EGC (Pvt.) Ltd. |

2. The queries submitted during the above mentioned pre-proposal meeting and their clarifications/ replies are summarized below for information of all prospective bidders:

Sr. No.	Queries	Reply
1.	PS cost of Geotechnical Investigation is not provided in the RFP, whereas it is stated in TOR that subject amount is present in Financial Tables. Kindly include the PS cost for the Geotechnical Investigations.	The RFP does not specify any Provisional Sum for Geotechnical Investigation. Lump Sum amount is required to be quoted by the consultants.
2.	Approval time for sub-consultancy of Geotechnical should be specified because it could delay the work activities.	The Client will process the approval of sub-consultancy of Geotechnical Investigation in an expeditious manner.
3.	Please clarify that if IEE or EIA has to be carried out for the project because RFP is silent about it.	Not required.
4.	Land acquisition of some of the ROW has already been done by NHA. Can NHA provide details of the area where land acquisition has been completed? Can alignment already approved be changed where land acquisition is an issue.	The successful consultant will be required to coordinate with field formations and solicit details of the acquired ROW (if any). The consultant is required to proceed in accordance with the provisions of para 3.3 of the TOR.
5.	Considering the scope of work required to be carried out, time required for geotechnical investigations and testing in laboratory, 04 months for detailed design is not rationale. It is proposed that the time period of the study may be increased to 06 months.	Not acceded to. The assignment is required to be completed in given time frame.

... 000 0 000 ...



National Highway Authority



REQUEST FOR PROPOSAL

for

Consultancy Services

for

**Detailed Design, Traffic Studies, Commercial
Feasibility Study and Bid Evaluation/ Bid
Comparative Analysis for Hyderabad – Sukkur
Motorway Project on Built-Operate-Transfer (BOT)
Basis under Public Private Partnership (PPP)
Arrangement**

Tender No. 6(481-B)

Pages (1 to 135)

November, 2018

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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!

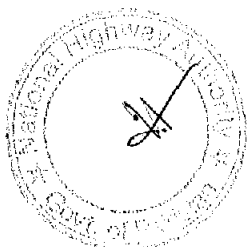
We extend warm welcome to you and invite you for participating in this project. We hope that you will live up to your reputation and provide us accurate information so that the evaluation is carried out "just and transparent". Please understand that the contents of this RFP, where applicable, shall be 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,
Facsimile: +92-51-9260419
E-mail: gmpca@nha.gov.pk,
Website: www.nha.gov.pk



ATTACHMENTS

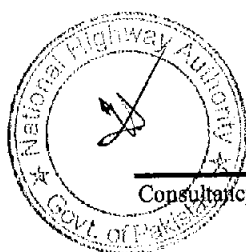
1. Instructions to Consultants (Annex A)
2. Data Sheet (Annex B)
3. Checklist for Completeness of Proposal
4. Summary Evaluation Sheet
4. Personnel Evaluation Sheet
5. Technical Proposal Forms
6. Financial Proposal Forms
7. Appendix A (Terms of Reference)
8. Appendix B (Person-Months and Activity Schedule)
9. Appendix C (Client's Requirements from the Consultants)
10. Appendix D (Personnel, Equipment, Facilities and other services to be provided by the Client).
11. Appendix E (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 Conflict of Interest

The Consultant is required to provide professional, objective, and impartial advice, at all times holding the Client's interests paramount, strictly avoiding conflicts with other assignments or its own corporate interests, and acting without any consideration for future work.

The Consultant has an obligation to disclose to the Client any situation of actual or potential conflict that impacts its capacity to serve the best interest of its Client. Failure to disclose such situations may lead to the disqualification of the Consultant or the termination of its Contract and/ or debarring by the Client.

Without limitation on the generality of the foregoing, and unless stated otherwise in the **Data Sheet**, the Consultant shall not be hired under the circumstances set forth below:

a. **Conflicting activities**

Conflict between consulting activities and procurement of goods, works or non-consulting services: a firm that has been engaged by the Client to provide goods, works, or non-consulting services for a project, or any of its Affiliates, shall be disqualified from providing consulting services resulting from or directly related to those goods, works, or non-consulting services. Conversely, a firm hired to provide consulting services for the preparation or implementation of a project, or any of its Affiliates, shall be disqualified from subsequently providing goods or works or non-consulting services resulting from or directly related to the consulting services for such preparation or implementation.

b. **Conflicting assignments**

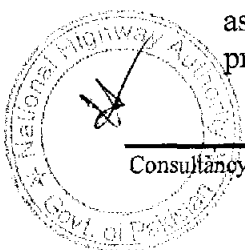
Conflict among consulting assignments: a Consultant (including its Experts and Specialist Sub-consultants) or any of its Affiliates shall not be hired for any assignment that, by its nature, may be in conflict with another assignment of the Consultant for the Client.

c. **Conflicting relationships**

Relationship with the Client's staff: a Consultant (including its Experts and Specialist Sub-consultants) that has a close business or family relationship with a professional staff of the Client, who are directly or indirectly involved in any part of (i) the preparation of the Terms of Reference for the assignment, (ii) the selection process for the Contract, or (iii) the supervision of the Contract, may not be awarded a Contract, unless the conflict stemming from this relationship has been resolved in a manner acceptable to the Client throughout the selection process and the execution of the Contract.

d. Any other types of conflicting relationships as indicated in the **Data Sheet**.

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 email, or facsimile shall be sent to the Client's address specified in the Data Sheet. The Client shall respond in writing by post, or email or facsimile to such requests and copies of the response shall be sent to all the 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 email, or facsimile 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 may also be specified. The Consultants are advised to suggest such names that shall be available for the Assignment.



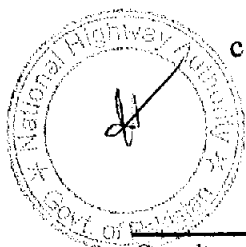
- (e) The technical proposal shall include duly filled in forms provided with this RFP. The name, background, and professional experience of each expert staff member to be assigned to the project, with particular reference to his experience of work of a nature similar to that of the proposed assignment.
- (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 While preparing the Technical Proposal, consultants are expected to examine all terms and instructions included in the RFP. Failure to provide all requested information shall be at consultant's risk and may result adversely in the scoring of the 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.

Penalty against non-compliance with the maximum page requirement based in the '**CHECKLIST OF REQUIRED FORMS**' provided in the Section of Technical Proposal Forms will be one (01) score point per excess page to be deducted from the total technical score. The consultants are instructed to submit the CVs of Key Personnel by truly following the format attached at Form A-5. The CV's submitted on format in deviation to that specified are susceptible of scoring low.

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. Consultant may utilize the services of expatriate experts but only to the extent for which the requisite expertise is not available with any Pakistani firm. In case of JV, the proposal should state clearly partners will be "Jointly and Severally" responsible for performance under the Contract and One (Representative) partner will be solely responsible for all dealings with the Client on behalf of the JV. 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 discouraged and only individual Specialist Sub-Consultants (having unique expertise which is not available with others) 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 estimated number of Key Personnel person-months required for the Assignment is stated in the Data Sheet. The proposal should be based on a number of Key Personnel person-months substantially in accordance with the above number. However, consultants may propose changes in the light of their experience through particular comments on the TOR.
 - f. 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. A Technical Proposal containing any financial information will be treated as non-responsive resulting in to rejection of the 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 Bye-Laws 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

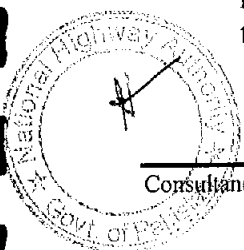
- 4.1 You shall submit one original technical proposal and one original financial proposal and the number of copies of each specified in the Data Sheet. Each proposal shall be in a separate envelope indicating original or copy, as appropriate. All technical proposals shall be placed in an envelope clearly 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: St. 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:

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

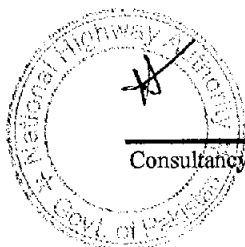
6. NEGOTIATION

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, email 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

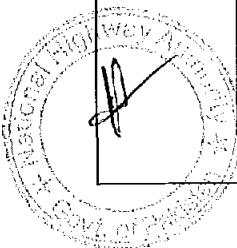
8.1 Please inform the Client by telex/facsimile courier or any other means:

- (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.

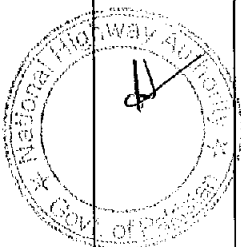


DATA SHEET

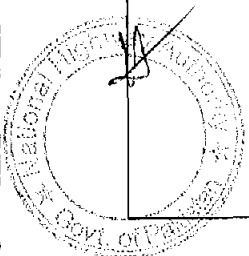
LOI Clause No.	DESCRIPTION OF CLAUSE
1.1	<p>The name of Assignment is: - Consultancy Services for “Detailed Design, Traffic Studies, Commercial Feasibility Study and Bid Evaluation/ Bid Comparative Analysis for Hyderabad – Sukkur Motorway Project on Built-Operate-Transfer (BOT) Basis under Public Private Partnership (PPP) Arrangement”.</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: 27th November, 2018 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 Assignment shall commence through issuance of commencement notice to the selected consultant by NHA. Any inordinate delay or cancellation of the procurement process by NHA for any reason whatsoever, including non-availability of funds shall not entitle the consultants to any financial or legal claims. However, when commencement of the Assignment has taken place then the consultants shall maintain the right subject to availability of proposed</p>



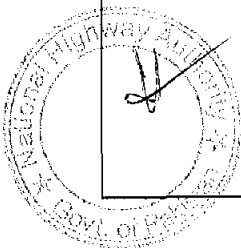
	<p>Key Personnel (professional staff) based on which the consultant was selected or if the delay is beyond six months then equally competent Key Personnel with equal or higher qualification and experience shall be pre-requisite for consideration of issuance of commencement notice by NHA. In case the work is delayed or abandoned for any reason whatsoever, the consultant shall not have any legal recourse.</p> <p>iv. The consultants may better not to propose names of Key Personnel already proposed in other proposals which are being evaluated by NHA or contract(s) awarded recently. This will affect adversely marking of these Personnel in evaluation of the technical proposal. Their secured points are liable to be reduced by 50% if their names appear in more than one previous proposal in which they are ranked No.1. Further the existing load of work with a firm shall be considered as one of the factors for the consideration in the award of the contract. No CV of any alternate Personnel shall be accepted during evaluation.</p> <p>iv. Form A-4 is meant for comments on provisions contained in RFP and 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 and award of the contract.</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> <p>vi. The term associates, if used in the proposal or otherwise shall not be considered as 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.</p>
<p>1.8</p>	<p>The Invited Consultants / Eligible Consultants are:</p> <p>Any firm meeting the following requirements:</p> <p>(a) Valid Registration Certificate of Pakistan Engineering Council with relevant Project Profile Codes. Foreign consulting firms shall make JV in accordance with Bye-Law 6(2) and Bye-Law 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) Affidavit in original bearing the subject with project name on stamp paper</p>



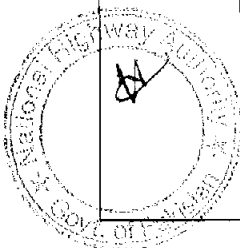
	<p>duly attested by the Oath Commissioner to the effect that the firm has neither been blacklisted nor any contract rescinded in the past for non-fulfillment of contractual obligations (By all partner firms in case of JV). Non submission of the affidavit may be treated as <u>disqualification resulting in to no further evaluation of the proposal.</u></p> <p>(c) Facilities available with the consultant to perform their functions effectively (proper office premises, software, hardware, record keeping etc.). The consultant should mention detail of all available facilities failing which <u>its proposal may be rejected resulting in to no further evaluation of the proposal.</u></p> <p>(d) Client's satisfaction certificates (Performance Reports) for the last three relevant assignments from the respective clients. Moreover, any adverse report regarding performance of consultant on NHA projects received from NHA's any relevant quarter may become basis for its disqualification from the Assignment above named in clause 1.1.</p> <p>(e) Signing and certification of the Checklist for Completeness of the Proposal as per attachment at the end of Data Sheet.</p> <p>(f) Person-months of staff and Project Duration as per TOR.</p>
2.1	<p>The Documents are:</p> <p>(a) Letter of Invitation (LOI).</p> <p>(b) Instructions to Consultants (ITC).</p> <p>(c) Data Sheet (DS).</p> <p>(d) Technical Proposal Forms.</p> <p>(e) Financial Proposal Forms.</p> <p>(f) Appendix – A: Terms of Reference (including Background information).</p> <p>(g) Appendix – B: Person-Months and Activity Schedule.</p> <p>(h) Appendix – C: Client's Requirements from the Consultants.</p> <p>(i) Appendix – D: Personnel Equipment, Facilities and Other Services to be Provided by the Client.</p> <p>(j) Appendix – E: Copy of Model Agreement (Draft Form of Contract & Appendices etc.).</p> <p>(k) Form of Contract (<i>For Consultants to perform services as a Joint Venture</i>).</p>
2.2	<p>The words "Twenty-one (21)" is deleted in its entirety and replaced with "Five (05)"</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.gov.pk</p>



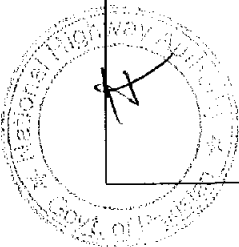
3.1.1	<p>Add following:</p> <p>The proposals should be bound in the hard book binding form to deny the possibility of removal or addition of page(s). All the pages of proposal must be signed and stamped in original by authorized representative of the firm/JV. All the pages must be numbered starting from first page to last. Any proposal found not adhering to these requirements shall be rejected.</p>
3.1.4	<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 are given below:</p>
FOR KEY PERSONNEL	
Senior Highway Engineer/ Team Leader	<p>Minimum B.Sc. (Civil Engineering) with minimum twenty (20) years' relevant experience [proven fifteen (15) years' design experience as Highway/ Geometric Design Engineer on National Highways Projects];</p> <p>-OR-</p> <p>M.Sc. (Transportation Engineering) with minimum eighteen (18) years relevant experience [proven thirteen (13) years' design experience as Highway/ Geometric Design 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>
Structural Engineer	<p>Minimum B.Sc. (Civil Engineering) with minimum twenty (20) years' relevant experience (proven fifteen (15) years' design experience as Structure Engineer on National Highways Projects);</p> <p>-OR-</p> <p>M.Sc. (Structural Engineering) with minimum eighteen (18) years relevant experience [proven thirteen (13) years' design experience as Structure Engineer on National Highways Projects].</p>
Hydrologist	<p>Minimum B.Sc. (Civil Engineering) with minimum twenty (20) years relevant experience [proven eighteen (18) years' design experience as Hydrologist on major Highway and Bridge Projects];</p> <p>-OR-</p> <p>M.Sc. (Hydrology / Drainage/ Hydraulic Engineering) with minimum eighteen (18) years relevant experience [proven sixteen (16) years' design experience as Hydrologist on major Highway and Bridge Projects];</p>



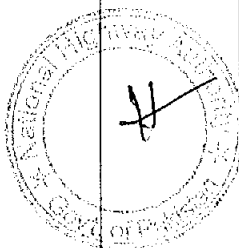
	Traffic Engineer	<p>Minimum B.Sc. (Civil Engineering) with minimum twenty (20) years' relevant experience [proven fifteen (15) years' design experience as Traffic Engineer on major Highways Projects];</p> <p>-OR-</p> <p>M.Sc. (Traffic Engg./ Transportation Engg.) with minimum eighteen (18) years' relevant experience [proven thirteen (13) years' design experience as Traffic Engineer on major Highways Projects].</p>
	Pavement Design Engineer	<p>Minimum B.Sc. (Civil Engineering) with minimum twenty (20) years' relevant experience [proven fifteen (15) years' design experience as Pavement Engineer on major Highway Projects];</p> <p>-OR-</p> <p>M.Sc. (Traffic Engg./ Transportation Engg./ Highway Engg.) with minimum eighteen (18) years' relevant experience [proven thirteen (13) years' design experience as Pavement Engineer on major Highway Projects].</p>
	PPP Expert	<p>B.Sc. (Civil)/ BBA/ LLB with minimum Fifteen (15) years' experience;</p> <p>-OR-</p> <p>M.Sc. (Civil)/ MBA/ ICMA/ LLM with minimum Ten (10) years' experience;</p> <p>-OR-</p> <p>PhD (Civil)/ PhD (Finance)/ CFA with minimum Seven (07) years' experience;</p> <p>-OR-</p> <p>MBA (Finance)/ ICMA/ LLB with minimum fifteen (15) years' experience;</p> <p>For all above, proven Five (05) years' experience as PPP Expert on mega infrastructure projects preferably Highway Projects.</p>
	Financial Expert	<p>Minimum M.Sc. Economics/ MBA (Finance)/ ICMA/ ACCA with minimum fifteen (15) years' relevant experience [proven thirteen (13) years' experience as Financial Expert on mega infrastructure projects preferably Highway Projects];</p> <p>-OR-</p> <p>Certificate of Chartered Accountancy with minimum</p>



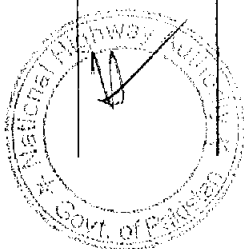
	<p>ten (10) years' relevant experience [proven five (05) years' experience as Chartered Accountant on mega infrastructure projects preferably Highway Projects].</p> <p>-OR-</p> <p>Certified Financial Analyst with minimum seven (07) years' relevant experience [proven three (03) years' experience as Certified Financial Analyst on mega infrastructure projects preferably Highway Projects].</p>
Corporate Law Expert	<p>Minimum Bachelors of Law (LLB) with minimum fifteen (15) years' relevant experience [proven thirteen (13) years' experience as Corporate Law Expert on mega infrastructure projects preferably Highway Projects];</p> <p>-OR-</p> <p>Masters of Law (LLM) Corporate Law, with minimum ten (10) years' relevant experience [proven eight (08) years' experience as Corporate Law Expert on mega infrastructure projects preferably Highway Projects].</p> <p>-OR-</p> <p>Masters of Law (Corporate Law) along with Bar at Law having minimum seven (07) years' relevant experience [proven five (05) years' experience as Corporate Law Expert on mega infrastructure projects preferably Highway Projects].</p>
Contract Specialist	<p>Minimum B.Sc. (Civil Engineering) with minimum fifteen (15) years relevant experience (proven ten (10) years' experience of Bidding/ Contract Documents. He/she must have adequate knowledge of FIDIC contractual scheme;</p> <p>-OR-</p> <p>M.Sc. (Contracts/ Procurement or Contracts Management) with minimum thirteen (13) years relevant experience (proven eight (08) years' experience of Bidding/ Contract Documents. He/she must have adequate knowledge of FIDIC contractual scheme.</p>
Economist	<p>Minimum M.S./ M.A. (Economics with specialization in Highways) with minimum fifteen (15) years relevant experience [preferably ten (10) years' experience of BOT/ PPP projects];</p> <p>-OR-</p>



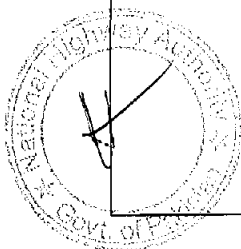
	M.Phil./ Ph.D. (Economics specialization in Highways) with minimum ten (10) years relevant experience [preferably seven (07) years' experience of BOT/ PPP projects].
Quantity Surveyor	D.A.E. (Civil); preferably having Bachelor's in Civil Engineering; In case of D.A.E. having minimum eighteen (18) years post-qualification experience in Highway Sector which includes proven ten (10) years' experience as Quantity Surveyor on Highway Projects; -OR- In case of Bachelor's Degree having minimum fifteen (15) years post-qualification experience in Highway Sector including seven (7) years' experience as Quantity Surveyor on Highway Projects;
Chief Surveyor	D.A.E. (Civil); preferably having Bachelor's in Civil Engineering. In case of D.A.E. having minimum eighteen (18) years post-qualification experience in Highway Sector which includes proven ten (10) years' experience as Chief Surveyor on Highway Projects. -OR- In case of Bachelor's Degree having minimum fifteen (15) years post-qualification experience in Highway Sector including seven (7) years' experience as Chief Surveyor on Highway Projects.
<u>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</u>	
<p>e. The minimum number of person-months of Key Personnel is:</p> <p>Total Expatriates: ___ Person-Months (Not used)</p> <p>Total Local Experts: 41 Person-Months</p> <p>f. 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</p>



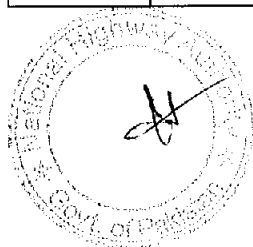
	<p>Consultant and the Client.</p> <p>ii. The Consultants are required to insure their Employees and Professionals for Hospitalization/ Medical, Travel and Accident Cover for the duration of the Contract. The details provided in Para 3.5 of Special Conditions of Contract in Model Contract.</p>								
4.1	<p>The number of copies of the Proposal required is:</p> <p>Technical Proposal: One Original and Three 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 Forms) in sealed envelope.</p> <p>The address for writing on the proposal is:</p> <p>General Manager (P&CA) National Highway Authority 28, Mauve Area G-9/1 Islamabad Telephone: +92-51-9032727 Facsimile: +92-51-9260419</p>								
4.4	<p>The date and time of proposal submission is:</p> <p>Date: 12th December, 2018 Time: 1130 hours Location of Submission: NHA Main Auditorium National Highway Authority 27, Mauve Area G-9/1 Islamabad.</p>								
4.5	<p>Validity period of the proposal is: 180 days The bid shall remain valid up to: 10th June, 2019 The location for negotiation of proposal is:</p> <p>General Manager (P&CA) National Highway Authority 28, Mauve Area G-9/1 Islamabad Telephone: +92-51-9032727 Facsimile: +92-51-9260419</p>								
5.2	<p>The evaluation of technical proposal shall be based on following criteria:</p> <table border="0"> <thead> <tr> <th style="text-align: left;">Description / Items</th> <th style="text-align: right;">Points</th> </tr> </thead> <tbody> <tr> <td>1. Experience of the Firm</td> <td style="text-align: right;">100</td> </tr> <tr> <td>1-a) General Experience in road Transport Sector</td> <td style="text-align: right;"><u>(25)</u></td> </tr> <tr> <td>1-b) Specific Experience related to particular Assignment</td> <td style="text-align: right;"><u>(75)</u></td> </tr> </tbody> </table>	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>
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	<p>2. Approach & Methodology 250</p> <p>2-a Appreciation of the Project <u>(70)</u></p> <p>(i). Evidence of Site Visit with Photographs <u>(30)</u></p> <p>(ii). Clarity of appreciation <u>(20)</u></p> <p>(iii). Comprehensiveness of appreciation <u>(20)</u></p> <p>2-b Problem Statement/ Understanding of Objectives <u>(50)</u></p> <p>(i). Identification of Problems/ Objectives <u>(30)</u></p> <p>(ii). Components of Proposed Services <u>(20)</u></p> <p>2-c Methodology <u>(80)</u></p> <p>(i). Proposed Solutions for this Project <u>(30)</u></p> <p>(ii). Quality of Methodology <u>(20)</u></p> <p>(iii). Conciseness, clarity and completeness of proposal <u>(30)</u></p> <p>2-d Suggested changes for improvement in TOR <u>(10)</u></p> <p>2-e Work Program <u>(20)</u></p> <p>2-f Staffing Schedule <u>(20)</u></p>										
	<p>3. Key Staff 450</p> <p>4. Performance Certification from clients 100</p> <p>5. Present Commitments (current engagement and available strength – justification) 50</p> <p>6. Transfer of Knowledge* (Methodology/ Plans) 50</p> <p style="text-align: right;">Total Points: 1000</p>										
	<p>Minimum qualifying technical score: 700</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.</p> <p>The points earmarked for evaluation sub-criteria (3) for suitability of Key Staff are:-</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">Description / Items</th> <th style="text-align: right;">Points (%)</th> </tr> </thead> <tbody> <tr> <td>i. Academic and General Qualifications</td> <td style="text-align: right;">30</td> </tr> <tr> <td>ii. Professional experience related to the Project</td> <td style="text-align: right;">60</td> </tr> <tr> <td>iii. Status with the firm (Permanent & duration with Firm as per LOI Clause 3.1.4 (d))</td> <td style="text-align: right;">10</td> </tr> <tr> <td style="text-align: right;">Total Points:</td> <td style="text-align: right;">100</td> </tr> </tbody> </table>	Description / Items	Points (%)	i. Academic and General Qualifications	30	ii. Professional experience related to the Project	60	iii. Status with the firm (Permanent & duration with Firm as per LOI Clause 3.1.4 (d))	10	Total Points:	100
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iii. Status with the firm (Permanent & duration with Firm as per LOI Clause 3.1.4 (d))	10										
Total Points:	100										
5.3.1	<p>Following is added:</p> <p>The words “three top-ranking qualifying consulting firms” is deleted in its entirety and replaced with the words “qualifying consultants”</p> <p>The date, time, and address of the financial proposal opening are:</p> <p>After evaluation and approval of technical proposals (TO BE INFORMED LATER).</p>										

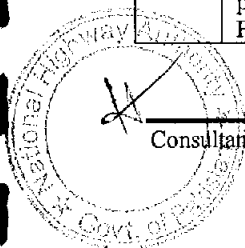


5.3.3	The weights given to the Technical and Financial Proposals are: Technical: 80% Financial: 20%
6.3	Add following at the end of this Para: The final person-months of each expert are subject to adjustment at the stage of contract negotiation in line with demonstrated approaches methodology and need basis.
7.2	The assignment is expected to commence in: January, 2019
8	The Clause is deleted in its entirety



Checklist for Completeness of Proposal

S. No.	Description	Must attach Documents	
		In case of Single Entity	In case of JV/ Sub-Consultants
1.	Power of Attorney to submit the Proposal (Original, scanned copy is not acceptable)	a. By the owner/owners of Firm to authorized representative. b. In case of more than one owner, legal authority of issuing Power of Attorney of Executant itself.	a. By the owner/ owners of each Firm to authorized representative. b. In case of more than one owner, legal authority of issuing Power of Attorney of Executant itself. c. Power of Attorney by the duly authorized representative(s) of member firm(s)/ sub-consultant(s) to the authorized representative of Lead Firm
2.	Power of Attorney to sign the Proposal (Original, scanned copy is not acceptable)	a. By the owner/owners of Firm to authorized representative. b. In case of more than one owner, legal authority of issuing Power of Attorney of Executant itself.	a. By the owner/ owners of each Firm to authorized representative. b. In case of more than one owner, legal authority of issuing Power of Attorney of Executants itself. c. Power of Attorney by the duly authorized representative(s) of member firm(s)/ sub-consultant(s) to the authorized representative of Lead Firm
3.	Letter of Intent to form JV on firm's letterhead/ JV agreement on stamp paper (Original, scanned copy is not acceptable)	N.A.	Each Firm (all JV members), including the Lead Firm, to sign through its authorized representative (along with authorization)
4.	TECHNICAL PROPOSAL FORMS A-1 to A-10 duly completed as per Instructions to Consultants/ Data Sheet and requirements of TOR <i>(To be attached with Technical Proposal)</i>	Must provide	Must provide
5.	Valid Registration Certificate of Pakistan Engineering Council with relevant Project Profile Codes	Must provide	Must provide
6.	Foreign consulting firms shall make JV in accordance with Bye-Law 6(2) and Bye-Law 9 of the Pakistan Engineering Council (Conduct and Practice of Consulting Engineers) Bye-Laws 1986	Must provide	Valid PEC License(s) must be provided at the time of submission of the proposal
7.	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	Must provide	Must be provided by all member firm(s) including the Lead firm (and sub-consultant(s) if applicable)
8.	Lists of facilities available with the Consultant to perform their functions effectively (proper office premises, software, hardware, record keeping etc.)	Must provide	Must be provided for each JV member including the Lead firm separately. In case of involvement of sub-consultant(s), will also be provided
9.	Affidavit on stamp paper duly attested by the Oath Commissioner to the effect that the proposed Personnel shall be available as per their proposed inputs in the Personnel Schedule and TOR	Must provide	Must be provided for each JV member including the Lead firm separately who has proposed Personnel. In case of involvement of Specialist sub-consultant(s), the affidavit will be signed by the individual himself
10.	Performance Certificate/ Assignment Completion Certificate (All completed projects mentioned under TECHNICAL PROPOSAL FORM A-2 CLIENT'S	Must provide	Must be provided for completed projects of each member including Lead firm



S. No.	Description	Must attach Documents	
		In case of Single Entity	In case of JV/ Sub-Consultants
	REFERENCE Note: Any project mentioned completed under Form TEC-2B 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.		
11.	Integrity Pact Document duly filled in the blank spaces with requisite information and signed/ stamped	Must provide	Must provide
12.	FINANCIAL PROPOSAL FORMS FIN-1 to FIN-7 duly completed as per Instructions to Consultants/ Data Sheet and requirements of TOR (To be attached with Financial Proposal)	Must provide	Must provide
13.	Audit Reports of the firm for past three years duly certified by Chartered Accountant (To be attached with Financial Proposal)	Must provide	Must be provided for each firm who proposes Personnel for the Assignment
14.	Sequential page numbering of Proposal. Signing and stamping of proposal (Technical and Financial) wherever indicated as well as initial/ signature and seal on all other pages of proposals. The Proposal is bound as hard book to deny addition/ removal of pages	Must fulfill the requirement	Must fulfill the requirement

Certification: -

I, the undersigned, certify to the best of my knowledge and belief that all above mentioned documents (as applicable), Sr. No.1 to 13 have been attached to our proposal (technical and financial) and signed and stamped as per requirements mentioned at Sr. No.14. In the event of any sort of falsification of this certification, the Client NHA may at its sole discretion disqualify our firm/JV from bidding for the Assignment named under Data Sheet Sub-Clause 1.1.

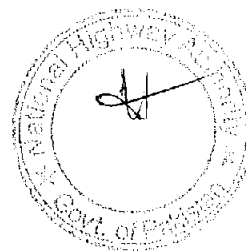
Signature of authorized representative of the firm(s) Date: _____
Day/Month/Year

Full name of authorized representative: _____

For and on behalf of: _____ {Name of the bidder}

(Seal)

Note: copy or scanned signatures are not allowed



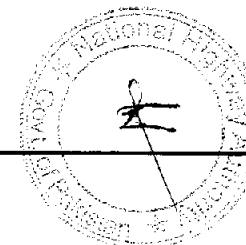
SUMMARY EVALUATION SHEET FOR FULL TECHNICAL PROPOSALS (QCBS)

EVALUATION CRITERIA	Max. Weight	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. <i>Appreciation of the Project</i>	70				
(i) Evidence of Site Visit with Photographs	(30)				
(ii) Clarity of appreciation	(20)				
(iii) Comprehensiveness of appreciation	(20)				
2-b. Quality of Methodology	50				
(i) Identification of Problems/ Objectives	(30)				
(ii) Components of Proposed Services	(20)				
2-c. Methodology	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. Senior Highway Engineer/Team Leader	50				
ii. Structural Engineers-I, II, III & IV	4x25				
iii. Hydrologist	40				
iv. Traffic Engineers-I & II	2x25				
v. Pavement Design Engineer	30				
vi. PPP Expert	40				
vii. Financial Expert	50				
viii. Corporate Law Expert	40				
ix. Contract Specialist	35				
x. Economist	15				
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 Weight x rating / 100.

Minimum qualifying score is 70% or 700 marks.



PERSONNEL EVALUATION SHEET

POSITION / AREA OF EXPERTISE	Name	Academic and General Qualification* Weight 30%		Project related Experience Weight 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. Senior Highway Engineer/ Team Leader								
ii. Structural Engineers-I, II, III & IV								
iii. Hydrologist								
iv. Traffic Engineers-I & II								
v. Pavement Design Engineer								
vi. PPP Expert								
vii. Financial Expert								
viii. Corporate Law Expert								
ix. Contract Specialist								
x. Economist								

Rating: - Excellent - 100%

Very good - 90-99%

Above Average - 80-89%

Average - 70-79%

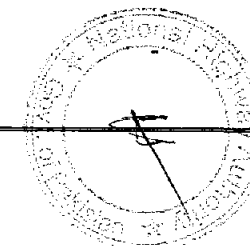
Below Average - 1-69%

Non-complying - 0%

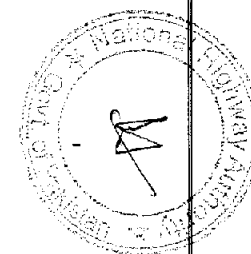
Score: Maximum Weight X rating / 100.

* CRITERIA FOR ACADEMIC AND GENERAL QUALIFICATION

Personnel	Sub-Criteria for Sub-Division of the indicated Weightage 30% herein above	Additional Marks	Additional Marks	Additional Marks
a. Senior Highway Engineer/ Team Leader	Q: Minimum B.Sc. (Civil Engineering) with minimum twenty (20) years' relevant experience [proven fifteen (15) years' design experience as Highway/ Geometric Design Engineer on National Highways Projects]. (Marks: 70%)	M.Sc. (Transportation Engineering) with minimum eighteen (18) years relevant experience [proven thirteen (13) years' design experience as Highway/ Geometric Design Engineer on National Highways Projects]. (Marks: 30%)	-	-
b. Structural Engineers	Q: Minimum B.Sc. (Civil Engineering) with minimum twenty (20) years' relevant experience (proven fifteen (15) years' design experience as Structure Engineer on National Highways Projects) (Marks: 70%)	M.Sc. (Structural Engineering) with minimum eighteen (18) years relevant experience [proven thirteen (13) years' design experience as Structure Engineer on National Highways Projects]. (Marks: 30%)		-

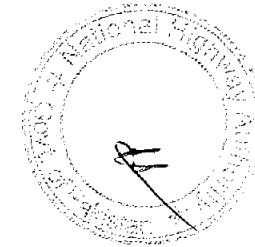


Personnel	Sub-Criteria for Sub-Division of the indicated Weightage 30% herein above	Additional Marks	Additional Marks	Additional Marks
c. Hydrologist	Q: Minimum B.Sc. (Civil Engineering) with minimum twenty (20) years relevant experience (proven eighteen (18) years' design experience as Hydrologist on major Highway and Bridge Projects) (Marks: 70%)	M.Sc. (Hydrology / Drainage/ Hydraulic Engineering) with minimum eighteen (18) years relevant experience [proven sixteen (16) years' design experience as Hydrologist on major Highway and Bridge Projects]. (Marks: 30%)	-	-
d. Traffic Engineers	Q: Minimum B.Sc. (Civil Engineering) with minimum twenty (20) years' relevant experience [proven fifteen (15) years' design experience as Traffic Engineer on major Highways Projects] (Marks: 70%)	M.Sc. (Traffic Engg. / Transportation Engg.) with minimum eighteen (18) years' relevant experience [proven thirteen (13) years' design experience as Traffic Engineer on major Highways Projects]. (Marks: 30%)	-	-
e. Pavement Design Engineer	Q: Minimum B.Sc. (Civil Engineering) with minimum twenty (20) years' relevant experience [proven fifteen (15) years' design experience as Pavement Engineer on major Highway Projects]. (Marks: 70%)	M.Sc. (Traffic Engg. / Transportation Engg. / Highway Engg.) with minimum eighteen (18) years' relevant experience [proven thirteen (13) years' design experience as Pavement Engineer on major Highway Projects]. (Marks: 30%)	-	-
f. PPP Expert	Q: B.Sc. (Civil)/ BBA/ LLB with minimum Fifteen (15) years' experience. (Marks: 70%)	M.Sc. (Civil)/ MBA/ ICMA/ LLM with minimum Ten (10) years' experience. (Marks: 10%)	PhD (Civil)/ PhD (Finance)/ CFA with minimum Seven (07) years' experience. (Marks: 10%)	MBA (Finance)/ ICMA/ LLB with minimum fifteen (15) years' experience. (Marks: 10%)
g. Financial Expert	Q: Minimum M.Sc. Economics/ MBA (Finance)/ ICMA/ ACCA with minimum fifteen (15) years' relevant experience [proven thirteen (13) years' experience as Financial Expert on mega infrastructure projects preferably Highway Projects]. (Marks: 70%)	Certificate of Chartered Accountancy with minimum ten (10) years' relevant experience [proven five (05) years' experience as Chartered Accountant on mega infrastructure projects preferably Highway Projects]. (Marks: 15%)	Certified Financial Analyst with minimum seven (07) years' relevant experience [proven three (03) years' experience as Certified Financial Analyst on mega infrastructure projects preferably Highway Projects]. (Marks: 15%)	-
h. Corporate Law Expert	Q: Minimum Bachelors of Law (LLB) with minimum fifteen (15) years' relevant experience [proven thirteen (13) years' experience as Corporate Law Expert on mega infrastructure projects preferably Highway Projects]. (Marks: 70%)	Masters of Law (LLM) Corporate Law, with minimum ten (10) years' relevant experience [proven eight (08) years' experience as Corporate Law Expert on mega infrastructure projects preferably Highway Projects]. (Marks: 15%)	Masters of Law (Corporate Law) along with Bar at Law having minimum seven (07) years' relevant experience [proven five (05) years' experience as Corporate Law Expert on mega infrastructure projects preferably Highway Projects]. (Marks: 15%)	-

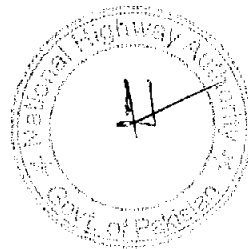


Personnel	Sub-Criteria for Sub-Division of the indicated Weightage 30% herein above	Additional Marks	Additional Marks	Additional Marks
i. Contract Specialist	Q; Minimum B.Sc. (Civil Engineering) with minimum fifteen (15) years relevant experience (proven ten (10) years' experience of Bidding/ Contract Documents. He/she must have adequate knowledge of FIDIC contractual scheme. (Marks: 70%)	M.Sc. (Contracts/ Procurement or Contracts Management) with minimum thirteen (13) years relevant experience (proven eight (08) years' experience of Bidding/ Contract Documents. He/she must have adequate knowledge of FIDIC contractual scheme. (Marks: 30%)	-	-
j. Economist	Q; Minimum M.S. / M.A. (Economics with specialization in Highways) with minimum fifteen (15) years relevant experience [preferably ten (10) years' experience of BOT/ PPP projects]. (Marks: 70%)	M. Phil. / Ph.D. (Economics specialization in Highways) with minimum ten (10) years relevant experience [preferably seven (07) years' experience of BOT/ PPP projects]. (Marks: 30%)	-	-

** Regular Employee - 100%;
First time for this assignment- 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 or a copy of an existing agreement.	
“√” If applicable	A-1 Attachment Power of Attorney	No pre-set format/form. In the case of a Joint Venture, several are required: a power of attorney for the authorized representative of each JV member and a Special power of attorney for the representative of the lead member to represent all JV members.	
√	A-2	Consultant’s Organization and Experience.	As given below
√	A-2A	A. Consultant’s Organization	3
√	A-2B	B. Consultant’s Experience/ Client’s Reference	20
√	A-3	Approach Paper on Methodology proposed for Performing the Assignment	50
√	A-4	Comments/ Suggestions of Consultant	[See footnote] ¹
√	A-4A	A. On the Terms of Reference	n/a
√	A-4B	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	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

{Location, Date}

To: [Name and address of Client]

Dear Sirs:

1. We, the undersigned, offer to provide the consulting services for [Insert the Project Name] in accordance with your Request for Proposals dated [Insert Date]. We are hereby submitting our Proposal, which includes this Technical Proposal and a Financial Proposal sealed in a separate envelope.
2. [{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 {insert: "of our letter of intent to form a joint venture" or, if a JV is already formed, "of the JV agreement"} signed by every participating member, 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 individual Specialist Sub-consultant, insert the following:

Our Proposal includes: {Insert full name and country of the individual Specialist Sub-consultant.}]

3. 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 may be sanctioned by the Client in compliance of Rule 19 of the Public Procurement Rules, 2004.
 - (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 member(s) or any of the proposed experts or Specialist Sub-consultant(s) prepared the TOR for this consultancy 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 is binding upon us and subject to any modifications resulting from the Contract negotiations.
 - (h) In compliance (and, if the award is made to us, in execution) of Contract, we undertake to obey the Integrity Pact (attached herewith duly signed by authorized representative and stamped)
 - (i) Our firm/ each member of our JV is not participating in any other proposal for this Assignment.
4. We undertake, if our Proposal is accepted and the Contract is signed, to initiate the Services related to the Assignment 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*).
 5. We understand that the Client is not bound to accept any or all Proposal(s) that the Client receives.

We remain,

Yours sincerely,

Authorized Signature {In full and initials}: _____

Name and Title of Signatory: _____

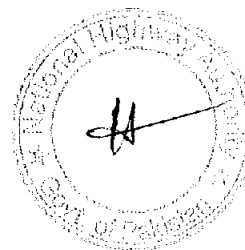
Name of Consultant (company's name or JV's name): _____

In the capacity of: _____

Address: _____

Contact information (phone and e-mail): _____

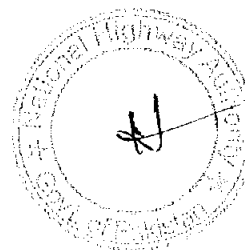
{For a joint venture, either all members shall sign or only the lead member, in which case the power of attorney to sign on behalf of all members shall be attached}



CONSULTANT'S ORGANIZATION

- [1. Provide here a brief description of the background and organization of your Firm, and -- in case of a joint venture -- of each member for this Assignment.

- 2. Include organizational chart, a list of Board of Directors, and beneficial ownership².]



² Beneficial ownership shows all owners and major shareholders of the company, including any person or entity who enjoys the benefit of ownership including, but not limited to power of control and influence of the business transactions, receiving dividends or profit share. This includes direct or indirect ownership of the company (e.g. ownership by close relatives)

CONSULTANT'S EXPERIENCE/ CLIENT'S REFERENCE

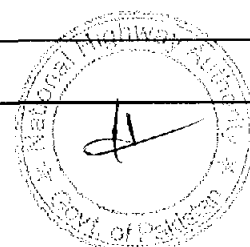
Relevant Services Carried Out in the Last Ten Years (by each member in case of JV) and by Specialist Sub-consultant, if any, Which Best Illustrate Qualifications

- [1. Using the format below, provide information on each successfully completed reference assignment for which your firm, either independently or as one of the member of Joint Venture (JV), was largely contracted by indicating the share of the firm itself in the JV.

2. Assignments completed by the Consultant's individual Experts working privately or through other consulting firms or that of the Consultant's Specialist Sub-consultant, cannot be claimed as the relevant experience of the Consultant, but can be claimed by the Experts or the Specialist Sub-consultants themselves in their CVs. The Consultant should be prepared to substantiate the claimed experience by presenting copies of relevant documents and references if so requested by the Client.]

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 Pak. Rs. (or US\$; mention the exchange rate used)
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		

Consultants' Name: _____



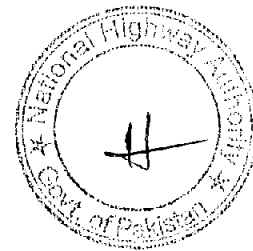
Form A-3**APPROACH PAPER ON METHODOLOGY PROPOSED FOR PERFORMING THE
ASSIGNMENT**

[In this part of the Technical Proposal, explain understanding of the objectives of the Assignment, approach to the services, methodology for carrying out the activities and obtaining the expected output, and the degree of the detail of such output. You should explain your methodology to complete the project within time and budget.

The approach must be indigenous project specific approach of Consultant and not a generic one or copy of the TOR.

Based on the specific approach, describe Work Plan which is consistent with inputs provided in Forms A – 8 and A – 9.

In case of JV, the role of each member must be clearly highlighted. Likewise, role of Specialist Sub-consultant, if any, along with necessity must be highlighted.]



**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 A-4A and A-4B respectively.]

A. On the Terms of Reference (TOR)

- 1.
 - 2.
 - 3.
- Etc.

B. On the Counterpart Staff and Facilities (data & services to be provided by the Client as indicated in the TOR):

- 1.
 - 2.
 - 3.
- Etc.

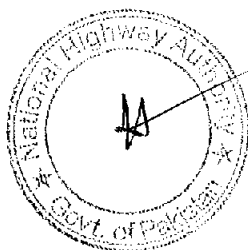
Note:

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



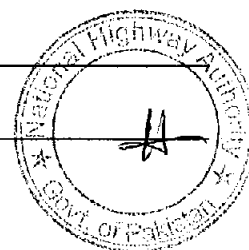
	<p>Data Sheet Sub-Clause-3.1.4 (e) respectively.</p> <p>(ii) The Proposal may include additional expert position/s. However, additional expert will be considered Non Key Personnel for the purpose of proposal evaluation.</p> <p>(iii) If the Proposal drops or replaces a Key Personnel position with a different 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.</p> <p>(iv) DO NOT INCLUDE EXCESS/SAVING INFORMATION IN TECHNICAL PROPOSAL. If Technical Proposal includes financial information, <u>the Proposal will be rejected under Clause-3.1.5 of ITC.</u></p> <p>2. <u>When the Consultant suggests a change in scope of service, activities or output, the Consultant must describe the details in Form A-4A and the change should not be incorporated in the Proposal.</u> Enumerate each suggestion in Form A-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 <u>without incorporating the changes.</u></p> <p>(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;</p> <p>(ii) DO NOT INCLUDE INCREMENTAL COST INFORMATION IN TECHNICAL PROPOSAL. If Technical Proposal includes financial information, <u>the Proposal will be rejected under Clause-3.1.5 of ITC.</u></p>
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Form A-5

**FORMAT OF CURRICULUM VITAE (CV) FOR PROPOSED KEY PERSONNEL AND
SPECIALIST SUB-CONSULTANT (IF ANY)**

1. Proposed Position: _____
2. Name of Firm ³: _____
3. Name of Staff: _____
4. Profession: _____
5. Date of Birth: _____
6. Years with Firm: _____
7. Nationality: _____
8. C.N.I.C Number: _____
9. Cell Number (functional): _____
10. Membership in Professional Societies: _____
(Membership of PEC is Mandatory ⁴)
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

³ Clearly mention that the Personnel is a permanent employee of the firm or is a freelancer. If vague statement given, the Personnel will be considered a freelancer.

⁴ The status of the candidate will be verified from PEC's website (online), if the firm mentions the Personnel to be permanent employee, then status of the employee must appear accordingly on the PEC's website otherwise the statement of the firm will be considered misrepresentation of facts and will be dealt with in accordance with PPRA Rule-19.

held and location of assignments. For experience in last ten years, 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:

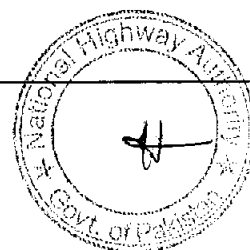
- (vii) I, as the authorized representative of the firm submitting this Proposal for the {name of project and contract}, certify that I have obtained the consent of the named expert to submit his/her CV, and that s/he will be available to carry out the assignment in accordance with the implementation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

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

Signature of expert or authorized Date: _____
representative of the firm Day/Month/Year

Full name of authorized representative: _____

Note: copy or scanned signatures are not allowed



COMPLETION AND SUBMISSION OF REPORTS AS PER TOR

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



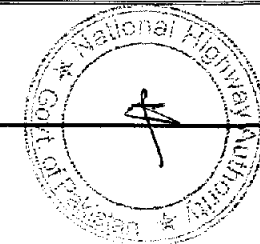
COMPOSITION OF THE TEAM PERSONNEL AND THE TASKS TO BE ASSIGNED TO EACH TEAM MEMBER

1. Key Personnel (and Specialist Sub-consultant, if any)

NAME	POSITION	Tasks Assignment	Present location	Name of assignment involved and clients names at present

2. Other Personnel

NAME	POSITION	Task Assignment



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 (AND SPECIALIST SUB-CONSULTANT, IF ANY)

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 _____



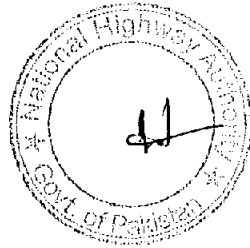
CURRENT COMMITMENTS OF THE FIRM
[OF EACH MEMBER IN CASE OF JV AND THE SPECIALIST SUB-CONSULTANT, IF ANY]

(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



FINANCIAL PROPOSAL FORMS



FINANCIAL PROPOSAL SUBMISSION FORM

{Location, Date}

To: [Name and address of Client]

Dear Sirs:

1. 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.
2. 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}.
3. As indicated and reasoned in Form A-4 of our Technical Proposal, in accordance with Note 2 under Form A-4 of the RFP, a separate attachment for incremental cost(s) is included/ not included in our Financial Proposal {if attached, strike out "not included" and vice versa}.
4. 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 (or the date extended with the written consent of consultant in case of delay in procurement process).
5. We confirm that we have no condition to state that may have financial implications over and above the amount quoted above.
6. We understand you are not bound to accept any Proposal you receive.

We remain,

Yours sincerely,

Authorized Signature {In full and initials}: _____

Name and Title of Signatory: _____

In the capacity of: _____

Address: _____

E-mail: _____

{For a joint venture, either all members shall sign or only the lead member, in which case the Power of Attorney to sign on behalf of all members shall be attached.}



BREAKDOWN OF RATES FOR CONSULTANCY CONTRACT

Project: _____ Firm: _____

Name	Position	Basic Salary per Cal. Month	Social Charges (%age of 1)	Overheads (%age of 1+2)	Sub-Total (1+2+3)	Fee (%age of 4)	Rate per Month for project Office	Field Allowance (%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 income tax. 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 firm 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, corporate tax and insurances, etc. Breakdown of proposed percentage charges for overhead should be submitted and supported (see Form A-14).

Item No. 5 Fee shall include firm's profit and share of salary of partners and directors {if not billed individually for the project} or indicated in overhead costs of the firm.

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 be preferably 50% of (8).

Note 2 The consultant is to provide appointment letters and affidavits/ undertakings duly signed by each of the individual Personnel showing salary rates as above. Further during execution each invoice will also be provided showing that the Personnel have been paid their salaries as per basic rates mentioned therein; failing to which, NHA will take punitive action against the consultant and shall deduct the deficient amount from its monthly invoice. Moreover it will be considered as a negative mark on the Consultant's performance that will be considered for future projects.

Note 3 The Consultant shall provide its audited financial statements of latest three fiscal years, during negotiations.



Full Name: _____

Signature: _____

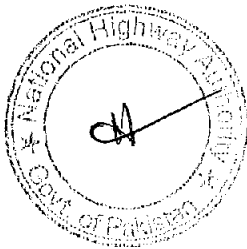
Title: _____

**A - ESTIMATED LOCAL CURRENCY SALARY/ REMUNERATION COSTS
EQUIVALENT IN US DOLLARS**

[Refer also to Notes under Form A-4]

Sl. No.	Name	Position	Person Months	Monthly Billing Rate (US\$)	Total Estimated Amount (US\$)
A. All Foreign Expatriates including Foreign Specialist Sub-consultant (if any)					
		Sub-Total:			

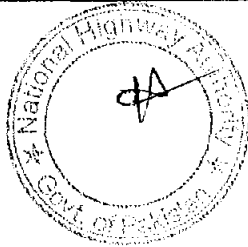
Not Applicable



B-I ESTIMATED LOCAL CURRENCY SALARY COSTS/REMUNERATION

[Refer also to Notes under Form TECH-4]

Sr. No.	Position	Name	Person-Months	Monthly Billing Rate (Rs.)	Total Estimated Amount (Rs.)
B-I. All Local Key Personnel and Specialist Sub-consultant (if any)					
Sub-Total:					

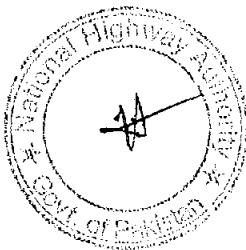


B-II ESTIMATED LOCAL CURRENCY SALARY COSTS/ REMUNERATION

[Refer also to Notes under Form A-4]

Sr. No.	Position	Person-Months	Monthly Billing Rate (Rs.)	Total Estimated Amount (Rs.)
B-II. Non-Key and other Personnel (Local)				
	Sub Total:			

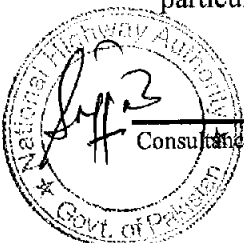
Note: The bidders are required to quote the monthly billing rates of Non Key and other Personnel given in the TOR in above table. The bidder(s) may propose Person-Months for Non Key Personnel in addition to those estimated by the Client in the TOR; however, in such a case tenable reasons must be given in the Technical Proposal Submission Form A-4 “**Comments on TOR**”. The Client’s Negotiation Committee will deliberate on the requirement of additional Non Key Personnel during Contract Negotiation meeting. It is also to be noted that the Client is not bound to agree to the reasons of Consultants given in the Form A-4.



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 / rental of Furniture / Furnishings	L.S			
4.	Rental costs of Office/ Other Equipment i. Computers and accessories ii. Photo copy machines iii. Communication equipment iv. Drafting / Engineering equipment v. Surveying instruments vi. Transport Vehicles vii. Site visits and Meetings in Islamabad during currency of Project and coordination during supervision	L.S			
5.	Communication expenses	Per Month	5.0		
6.	Drafting/ Reproduction of Reports	L.S			
7.	Office/ Drafting Supplies	L.S			
8.	Topographic Survey	L.S			
9.	Detailed Soil Investigation	L.S			
10.	Field Traffic Counts, Network Traffic Modeling and Report Writing	L.S			
11.	Geotechnical Investigation	L.S			
12.	Satellite Imagery	L.S			
13.	IEE (if required)	L.S			
14.	Hydrology/ Hydraulic Study	L.S			
15.	Others not covered above to comply with TOR requirement*				
Total					

* Any additional item/ cost quoted against this line item must be supported by solid/ tenable justification(s) detailed in Technical Proposal Submission Form A-4 "Comments on TOR" without indicating financial value therein. The negotiation committee of the Client may negotiate this cost on the basis of justification provided in the form A-4 with the prospective successful bidder in the light of Clause ITC 6.6 of RFP. Moreover, if no justification is given or Client does not agree to the justifications, the Client in both the cases **shall not** include this cost in the total cost offered by the Consultants for this assignment, particularly in case any amount against this line item is deemed to have been covered in other pay items.



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	
5.	Grand Total ¹:	

Note: 1- This cost should be inclusive of all the activities, whether specified or not, to complete the services spelled out in the TOR.

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.

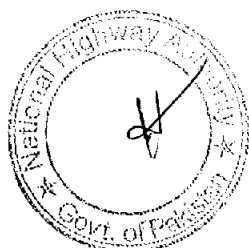
3- The grand total is inclusive of all the applicable Federal, Provincial and Local taxes. All these taxes (except the Sales Tax) are required to be built in the quoted rates and not be mentioned separately.

4- 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.

* The Provisional Sum amount (capped) shall be reimbursed against receipts of sales tax paid by the Consultants to the Government as and if it is charged by the relevant authority.

OR

As per policy of Government(s) from time to time.



APPENDIX-A

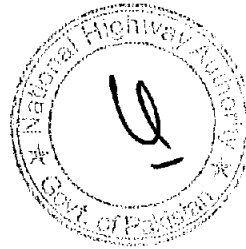
TERMS OF REFERENCE

(TOR)



This TOR is composed of two parts. Part-I is related to Technical Study while Part-II is related to Commercial Feasibility. Part-I will be dealt with by NHA's Design Section whereas Part-II by PPP Section. The TOR does not necessarily represent logical sequence of activities.

Part-I (TECHNICAL STUDY)



1. INTRODUCTION

National Highway Authority intends to develop a Motorway facility between Hyderabad and Sukkur under Public Private Partnership arrangement which will include but not limited to all earthworks, pavement works, structural works, drainage & erosion protection works, ancillary works, electromechanical works, landscaping/ greening works, rest and services areas, Intelligent Transportation Systems etc. Approximate length of the facility will be approximately 300 KM.

The proposed facility will ensure high-speed connectivity of Karachi with other parts of the Country via the under-construction Motorway facilities between Sukkur & Multan, and Multan & Lahore. It will be a fully fenced facility covering appropriate width to secure the future extension of the roadway.

The Feasibility Study for the project was carried out by a Chinese firm while ground validation and outline/preliminary designing was carried out by a local consultant in year 2014. The alignment and corridor of the project is hence already defined. NHA reserves the right to share available data with successful consultant only to the extent deemed appropriate.

2. SUMMARY OF SCOPE OF WORK AND TECHNICAL PARAMETERS

Assignment envisaged by NHA is to step up the existing outline/preliminary design to develop an accurate estimate with maximum cost optimization. This is only possible when every design aspect is done in detail. Project is therefore detailed design with the main objective of cost optimization. Following two scenarios require to be considered:

- 4-Lane carriageway with 6-Lane structures.
- 6-Lane carriageway.

The construction cost and traffic numbers etc. for both scenarios will enable NHA to decide the basis of Government support requirement, and NHA can decide which one is appropriate to opt.

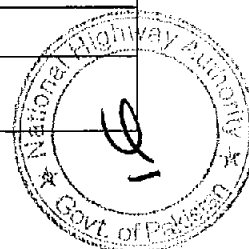
The summary of scope of work for detailed design is presented as following which will be read in conjunction with detailed Tasks presented in later parts of the TOR. Any activity/ task or requirement under this TOR will not absolve consultant from any contractual obligation stipulated in general or special conditions. The whole assignment is required to be completed as per best project management practices and, as stated in general conditions of the contract, in a timely, diligent, professional, and efficient manner by acting as a faithful advisor.



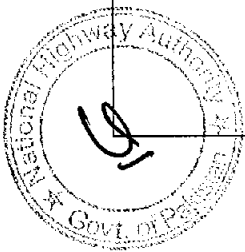
- ◆ Collection of data for detailed design through coordination with all concerned Departments.
- ◆ Comprehensive alignment study and submission of a detailed report thereof along with presentation thereon along with cross-section for approval from NHA.
- ◆ Detailed topographic survey for which maximum allowable interval shall be 50m or less to define centerline. Complete plan & profile drawings showing complete alignment are required at 1:1000 and 1:100 H:V scale.
 - ◆ Traffic and axle load survey.
 - ◆ Hydrology/Hydraulic study.
- ◆ Soil investigations.
- ◆ Development of detailed BOQ for Geotechnical Investigations and carrying out the same through specialized contractor for all major structures.
- ◆ Details of land acquisition & utility folders in the form of GIS Corridor Mapping report.
- ◆ Detailed geometric design, structural design, pavement & embankment design, drainage design, roadside design, road furniture lighting design, drainage design, traffic control devices design, work zone safety design, ITS design, design for provision of ducts/crossing of future utilities like OFC, pipelines etc., design of toll plazas, service areas, rest areas etc., horticulture and landscaping design, road user facilitation requirements etc.
- ◆ Submission of Tender Drawings and Tender Documents along with BOQ, Engineer's Estimate, Take-off sheets for Engineer's Estimate and "C" factor.
- ◆ Preparation/revisions of PC-1.

Technical parameters are proposed as under which may be reviewed by the consultant and improvement may be proposed (in relevant forms of technical proposal) on the basis of specialized knowledge and expertise in the context of project. Proposed amendments, if any, should be realistic, practicable, and cost effective in project context. The amendments should be highlighted in technical proposal as well as kick-off meeting after award of contract. If consultant requires any clarification regarding parameters then same must be solicited in written and a timely manner instead of making a presumption.

	Main Carriageway	Interchange
Design Speed (km/hr)	120	60
Design Vehicle	Tractor Trailer 6-Axle	Tractor Trailer 6-Axle
Minimum radius (m)	1,200	125
Radius above which no Super elevation is required (m)	852	213



Maximum radius with no Super elevation (m)	3,510	1,030
Maximum Super elevation (%)	6	6
Ramping grade (%)	0.3	0.6
Desirable minimum spiral length (m)	67	33
Minimum stopping sight distance (m)	250	85
“K” value for crest vertical curve	95	11
“K” value for sag vertical curve	63	18
Acceleration length to entrance (m)	410	n/a
Deceleration length (m) to 40 km/hr	155	n/a
Maximum vertical gradient (%)	1.5	3.0
Minimum vertical gradient (%)	0.3	0.3
Minimum turning radius (m)	15	15
Vertical clearance for road bridges (m)	5.3	n/a
Vertical clearance for railway bridges (m)	7.0	n/a
Vehicle Underpass vertical clearance (m)	5.3	n/a
Subway/Cattle Creep vertical clearance (m)	4.5	n/a
Other Geometric Design Standards	As per Latest published version of “A Policy on Geometric Design of Highway and Streets” by AASHTO. Highway alignment is done already for a design speed of 120 kph which will be kept in updated design. All relevant AASHTO standards will govern, except maximum grade on Motorway alignment which shall not be more than 1.5% and ‘roller coaster’ profile is not acceptable at all.	
Carriageway Standards	<ul style="list-style-type: none"> • Lane width 3.65m • Concrete curbed Shoulder 3.5m useable TST outer and 1 m inner paved • Service road where required 3.65m with 1.5 m shoulders either side TST. • All the lay-by, acceleration and deceleration lanes will be designed for pigmentation with colored aggregates and chrome base pigment. • Anti-glare shield at required locations. • Acceleration & Deceleration lanes as per AASHTO. • Metallic beam guardrail will be installed where required. • Embankment side slopes will be designed with side slope protection as required having 	



	minimum slope for embankment as 2H:1V.
Design of Road User Facilitation Requirements	<ul style="list-style-type: none"> • Provision of breakdown and accident response system • Provision of vehicle fitness checking system on applicable international standards; • Provision of solar fog lighting system for vehicular guidance in identified area of fog • Emergency call service along the Motorway • Fully automated 24/7 (Electronic Toll Collection system) Toll Plazas. • The automated vehicle detection system using video technology; Automatic License Plate Reader (ALPR) using high-resolution high-speed cameras and image recognition. • Weigh-in-motion (WIM) station at every interchange • Lighting of Interchanges, Major Bridges and critical areas i.e. Toll Plazas, weigh stations and vicinity of interchanges 5 km either side and 10 Km at terminal points.
Roadside Design. Roadside design pertains to the design of area between the outside shoulder edge and ROW limits. It involves safe design of features like embankment slopes, cut slopes, roadside clearances, roadside drainage slopes, design of road signs and luminaire with breakaway supports, roadside barriers and bridge railings etc.	As per Latest published version of "AASHTO Roadside Design Guide"
Design of bridge structures, cross-drainage structures etc.	As per Latest published version of "AASHTO Guide Specifications for LRFD Seismic Bridge Design" along with West Pakistan Code of Practice for Highway Bridges and Seismic Zone Mapping of Pakistan
Design of training works for bridges	Best design option from numerical modelling and physical modelling.
Lighting	As per Latest published version of "Roadway lighting design guide" by AASHTO.
Drainage design	As per Latest published version of "Highway Drainage Guidelines" by AASHTO.
Pavement Design for main carriageway, interchanges, and toll plaza approach roads, and road network (if any) within service areas.	As per latest published version of "AASHTO Guide for Design of Pavement Structures".
Design of Traffic Control Devices, work zone safety, and preparation of	As per latest published version of "Manual of Uniform Traffic Control Devices (MUTCD)" by



'Maintenance & Protection of Traffic (MPT) Plans'	FHWA USA.
Design of Intelligent Transportation System	As per best international practices/ standards/ guidelines
For testing of materials, following codes and standards will be followed:	ASTM & AASHTO

3. DETAILED SCOPE OF WORK

Major tasks in scope of work are explained in the following paragraphs and do not necessarily represent logical sequence of activities. Content of paragraphs will take precedence in case of any ambiguity in the headings.

3.1. Kick-off Meeting

The day on which Contract Agreement is signed between NHA and the consultant, the authorized representative of the consultant without wasting any time will immediately coordinate with Design Section and submit a written request on the same day to get date for a kick-off meeting. Delay or negligence on part of consultant in this regard will affect performance rating. The kick-off meeting will be held at NHA HQs that will be attended by representatives of NHA and consultant. Representatives of consultant will include Team Leader, authorized representative and other senior members, as deemed appropriate by consultant or as advised by NHA.

The Consultant will present detailed approach and methodology for carrying out the assignment and timelines for all activities and deliverables. The consultant will also present details of the survey team and their survey program for approval of NHA. Detailed program for traffic axle load survey will also be presented for approval of NHA. The consultant will record instructions of NHA and pay heed to the same in letter and spirit as per contractual obligations. The timeline presented in the technical proposal and subsequent kick-off meeting will not only form basis for monitoring & controlling all activities but also for performance rating of the consultant. Time overruns, for reasons not attributable to NHA or to unforeseen events, will affect performance rating and may also lead to penalty under general conditions of contract.

3.2. Data Collection

Immediately after signing of the Contract, the consultant will mobilize to get possession of relevant data including but not necessarily limited to maps, imageries, geological reports, agricultural soil reports, soil survey reports, rainfall data etc., required for preparing the design of the Project. If any



payments are involved in data acquisition, the same will be made by the consultant to the respective organization. After completion of the design, data will be returned back to the respective organization/department in Original and un-damaged condition. In case any authorization is required by the concerned office for obtaining the required information, same will be sought from NHA in the form of *Authority Letter*.

The Consultant should inform the local police and administration before conducting all types of field surveys. Before planning the field reconnaissance, the consultant should coordinate meetings with the local city development / Highway Department to know any future plans for city expansion and provincial roads etc.

Deliverable: Detailed status reports regarding data collection are required to be submitted by the consultant on 15th and 30th day after signing of contract which will be required for monitoring & controlling of all activities and performance rating of consultant. Each & every page of the submission must be signed and stamped by the consultant.

3.3. Review of Preliminary/Outline Design

After desk studies, detailed field reconnaissance will be carried out by the Team Leader along with his team. During the reconnaissance visit, particular requirements of project will be identified that will be addressed in the detailed Design. The resulting information will form part of the recommendations for adoption of a particular corridor. In the reconnaissance visit, consultant should record some Geographic Co-ordinates of physical features on ground using GPS (Dual Frequency, high accuracy). It will be used in geo-referencing/north-rectification of the satellite imageries. Coordinated meetings with local departments, if required, will be done by the consultant and proceedings thereof recorded.

Deliverable: On the basis of desk studies and comprehensive field reconnaissance, the consultant will prepare and submit Design Review Report. The report is required to contain consultant's review of the preliminary/outline design, elaborate complete project alignment along with photographs, constraints, challenges, risks that may pose threats or offer opportunities to the project, alternative alignment options (if any), proposed improvements in alignment, highlight any other project that may have a direct or indirect bearing on this project now or in future, recommendations etc. Each & every page of the submission must be signed and stamped by the consultant.

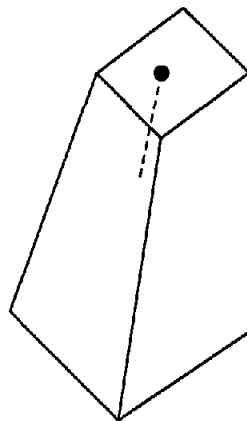


3.4. Topographic Survey

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 will submit to the Client detailed topographic survey program with



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.

actual human resources planned to be deployed, and get approval of **Topographic Survey Program** from NHA. The consultant will specify *the time line of survey program*. Total number of equipment with models and calibration certificates not more than 6 months old will be produced. The name and qualifications of surveyors will 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*. The Consultant must ensure that the survey firm is not black listed and has sufficient resources and compliance of Surveying and Mapping Act 2014.

3.4.1. 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.

3.4.2. Control for Traverse

Projection: UTM

Datum: WGS84

Vertical Datum: MSL

3.4.3. Horizontal Control

Minimum four (4) DGPS Primary Controls at start and End of the Project or as many as may be required such that the distance between these points will not be more than 10 Km. Minimum observation time will be at least ten (10) hours or as required for each of these points. These points will 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.

Primary Controls

DGPS Primary Controls will be established at a maximum distance of 2.5 Km 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 Km one additional DGPS point with two (2) hours observation (to form an inter-visible pair) will be established, which may be used for Total station if needed for topographic survey.

Secondary Controls

DGPS Secondary Controls will 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 will be at least 45 minutes for each of these points.

3.4.4. Vertical Control

Vertical Control will 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 will be used. The maximum distance between the two successive reading points will not be more than 50m. All



horizontal control points are connected with monuments made for Horizontal primary and secondary controls with double run level to control the height as mentioned above.

3.4.5. Monuments for Horizontal and Vertical Controls

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

3.4.6. Topographic survey (scale 1:1,000); including on ground features, buildings, Utilities and Crossing Roads

- a. 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) will be taken to create a topographic map in the scale of 1:1,000 and 1:100 H:V scale
- b. 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.

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

- a. The distance between the centerline points will be 50m in general, in case of the pond the stake is fixed on the bank of the inclination and waterline.
- b. The distance between the stakes is 5m-8m on the section of roads which have retaining walls.
- c. The distance between the stakes is 10m on the interchange slip road whose radius is less than 60m.
- d. The distance between the stakes is 5m for the 10m before and after the chainage of the abutment for a total distance of 20m.
- e. Minimum three longitudinal sections (parallel to Alignment) including the center axis, the left and right edge lines of the bridge will be measured. For the places where the topography



is changed and bridge pier and abutment, more stakes will be established.

- f. 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.
- g. 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).
- h. The position of 10KV high-pressure pole(tower) around the route within 100m, and the power line's lowest elevation on the crossing point
- i. The stake's elevation will be measured one by one.
- j. 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 will be measured

3.4.8. Cross section Points

- a. The cross section should be measured one by one.
- b. The cross section of the embankment should be measured at 50m or less interval for the straight line sections and curve sections with radius larger than 5,000m. At curves having radius less than $R=5000$ m, the cross sections will be measured at preferably 25m interval.
- c. The cross section will be measured to the ROW limit.
- d. For the alignment sections with proposed retaining wall, the cross section will be measured at 5m interval
- e. For the bridge pier, the measuring range of the cross section is 10m at both left and right sides of the center; for the bridge abutment, the measuring range is till the ROW limit



3.4.9. 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.

3.4.10. 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.

3.4.11. 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.

3.4.12. Survey for Crossing Water Channels/ Nullas

Measure the center longitudinal section of the water Channel/ Nullas from 100m upstream to 50m downstream, and measure the cross section of the water channel/ nullas at 10m interval, which is perpendicular to their axis. Minimum 5 points will be taken at each 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 will not be more than 5m for wider water channels/ nullas.

3.4.13. Survey corridor

The detailed topographic survey in normal circumstances will be carried out in a corridor of 100m. At locations of crossing rivers, nullas the detail of survey extent is given in respective sections.

3.4.14. Mapping (Unit of Measurement)

Metric units will be used throughout.



3.4.15. Scale

Besides soft copy, mapping of drawings will be plotted to a scale of 1:1000.

3.4.16. Details to be Shown

Buildings/Structures

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

Roads, Tracks and Footpaths

1. Kerb 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 kerb 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 will 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.
5. Guardrails.
6. 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).

Survey

1. Survey Department Trigonometric Stations.
2. Permanent Ground Markers.
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 (if any).
6. Mining tips (if any).
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. Lakes.
2. Ponds or mining pools.
3. Reservoirs.
4. Rivers (name to be indicated).
5. Streams.
6. Ditches (width to be indicated).
7. Canals.
8. Wells (diameter or width to be indicated).
9. Swamps.
10. Lined drains (width, depth and type to be indicate).
11. Water towers.
12. Culverts.
13. Waterfalls.
14. Jetties (if any).
15. The top of banks of all water features over 1.0m wide will 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 will be indicated.

16. 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.
17. Slope conventions will be drawn as near as possible to indicate the actual shape of the slope face, i.e., all berms and terraces will be detailed.

Any other features not listed, which are requested by the Client will also be shown.

3.4.17. Bridge details

The bridge details will be shown on a separate drawing for each bridge. The bridge observations in form of coordinates will include the following: -

- a) The coordinates and levels of the four corners of the bridge (points will 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 centerline 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 centerline passing underneath) showing all the relevant levels, offsets and skew angle.

3.4.18. Culvert details

Details of each culvert are to be shown on the survey plans and a separate sheet with 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 centerline.
- c) Skew angle of the culvert from the centerline.



- d) Length of culvert from each side of the centerline.
- 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 enough points will be recorded so that the culvert can be modeled in CAD.

3.4.19. 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.



3.4.20. Details of junctions and existing roads

The Surveyor will survey all junctions to enable the designer to design the junction properly. A corridor width of 70m and will 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 the width greater than 2m will have a minimum of two (2) points defining both edges of the carriageways. Consecutive points along the road feature will 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 will be recorded for paved roads having widths greater than 6.0m. The main destination of the road from the junction will be recorded by the Surveyor.

Where necessary to survey along an existing road, the Surveyor will 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) will be picked up and will not



exceed 10m. More points are generally to define super-elevation changes at curve sections

3.4.21. Digital Ground Models (DGM)

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

All survey feature lines will herein be referred as 'strings'. The data will 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 will be simulated by strings of coordinated information along characteristic lines on the terrain. The models will consist of three dimensional (3D) contour strings.

The existing road surface over the required area will 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.

3.4.22. Grid

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

3.4.23. String Labeling

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



3.4.24. Property Model

This model will 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 will be appended to in the AutoCAD format. Such information will be used by the Surveyor when preparing Land Utility folders at the end.

3.4.25. Contours

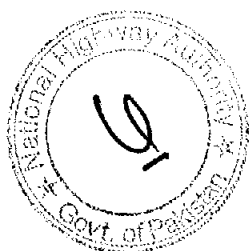
After digital data collection of survey points at site, the contour generation will be done by using computer software. The interval will be 1 m. The smoothness factor to be defined in the software should be such that it should not distort the ground contour representation. The contours should be well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

During data collection, break lines on the ground should be very well picked that affects the contour generation. Contours will be shown by continuous lines with a thicker line for every fifth contour (Prominent Contour). Contour and spot heights will be differentiated from other detail. The value of each contour will 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.

3.4.26. Longitudinal Profile and Cross-Section

The longitudinal profile plan will be plotted in A1/A3 size (as instructed by Client) to a scale of 1:1000 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 will be plotted in A1 size to a scale of 1:100 both horizontal and vertical with 25 m interval. The plan will show the chainage interval as specified and the existing ground profile and all the existing features.



3.4.27. Field Books and Record

All field books and computer data must be properly kept and will record truthfully all the survey work carried out. The Surveyor will do all workings in proper books, adequately in good style and according to best practice. All field books will be done in ink. Unsatisfactory works and errors will be struck off and there will 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 will 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 will be certified by the qualified surveyor.

Deliverable: After submitting Topographic Survey Program to NHA and soliciting approval thereof, the Consultant will carry out survey activities and accordingly submit the required number of copies of Topographic Survey Report along with Plans on 1:1,000 scale for main carriageway and 1:5,000 for interchanges and Digital Ground Model on completion of all survey works in a format as approved by the client. Each control will be shown in the report in photograph along with coordinates thereof and location map/diagram. 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. Each & every page of the submission must be signed and stamped by the consultant.

3.5. Traffic & Axle Load Survey

The consultant will submit Traffic & Axle Load Survey Program to NHA for approval. The consultant will carry out minimum 72 hours' traffic volumes counts, O&D Survey, journey time travel survey, tyre pressure and axle load survey etc. on existing roads crossing the alignment to get an estimate of current traffic volumes. Generated / diverted traffic volumes will be worked out. Enough points for traffic study will be proposed by the consultant for seeking approval of NHA in order to have best possible estimation of volume as well as classification of anticipated traffic and carry out reliable network modeling by considering present road network including CPEC projects.

The consultant should keep in mind that NHA intends to explore different options for Viability Gap Funding solutions, especially through cross-



subsidization with Sukkur-Multan Motorway (presently under-construction). Therefore, traffic studies and modelling must take into account expected traffic of Sukkur-Multan Motorway.

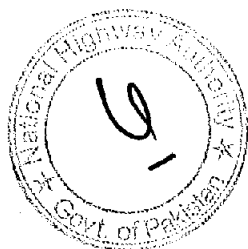
Origin-Destination Surveys will be carried out as and where required. Weekly and monthly correction factors will be worked out to arrive at Annual Average Daily Traffic (AADT). Growth factors will be worked out based on which the traffic will be forecasted for 10 & 20 years. Axle load survey will be undertaken using portable weighing machine. Consultant will confirm in his technical proposal the availability of such equipment (ownership / rental basis). Sufficient samples of all axle groups will be weighed. Network modeling will also be carried out by the Concessionaire as it is important study to avoid future congestion and bottlenecks in a system.

Deliverable: After submitting Traffic & Axle Load Survey Program to NHA and soliciting approval thereof, Traffic & Axle Load Survey will be completed and a comprehensive 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.

Since the Project is being taken up for PPP mode of financing, therefore reliable traffic estimation is highly required. Network modeling will be presented in the report to provide an understanding of expected traffic pattern after development of project. NHA understands that *Vissum* software is a good option; however, if consultant has any other proposal it may mention it in its proposal. NHA may discuss the proposed option during contract negotiations.

3.6. Soil & Material Investigation

Soil & Material Investigation will be done to ascertain the index and engineering properties of soil & rock encountered. 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 will 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 the complexity of the problem.

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



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

3.6.1. 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 under: -

Test	Test Requirement				
	Fine Aggregate		Coarse Aggregate		Water
	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					•
Marwill Test				•	
Stripping Test				•	

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.



3.6.2. 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* will include field strength, moisture content, bedding state if applicable discontinuities and state of weathering. *Material Characteristics* will cover Color, Composition, and grading. Particle shape, soil name and soil group. Both Unified and AASHTO classification will be used.

Deliverable: Detailed Soil & Material Investigation Report will be submitted as per requirements explained in preceding paragraphs.

3.7. Geotechnical Investigations

Consultant shall appoint, after the approval of the Employer, a "Nominated Specialist Contractor" to perform geotechnical investigations including field and laboratory testing against a lump sum amount kept in the contract.

After the formulation of tentative scope of work for sub-surface investigations and subsequent approval of NHA, if the design 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). The design consultant shall submit a 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.

Work shall commence on site based upon a formal agreement between the consultant and nominated specialist contractor (including quantities, rates, work schedule and TOR). The Employer would pay a lump sum amount kept in the contract to the consultant as the fee for this work on submission of invoice by the consultant. Consultant will supervise the subsurface 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.

Deliverable: A comprehensive report will be prepared 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.

3.8. Pavement Design

After the traffic count and projections for designed life of 10 years are done, and axle load survey and tyre pressure data is completed, and the soil investigations data is available; the pavement design will be done. The consultant will design the pavement by using latest published version of AASHTO Pavement Design Guide and verify the design by mechanistic analysis using Shell and Asphalt Institute Models. Pavement will be designed for a period of 10 years and overlay for next 10 years. Two options will be designed and compared in pavement design report i.e. flexible pavement option and composite pavement option. Rigid pavement option will also be developed complete in all respects along with proposed locations thereof (e.g. Toll Plazas, if considered appropriate).

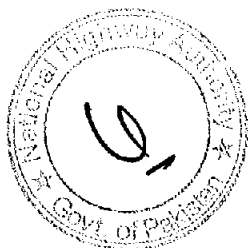
Deliverable: Pavement Design Report, complete in all respects also containing details of embankment design as well as drainage design. All calculations will be attached in the report and editable copies thereof will be submitted to NHA.

3.9. Hydrology & Hydraulic Study

3.9.1. 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.

3.9.2. Scope of Work / Activities

The consultant will adopt state-of-the-art mathematical modeling approach using industry-standard software 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. ArcHydro, 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-GeoHMS 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.
- 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.

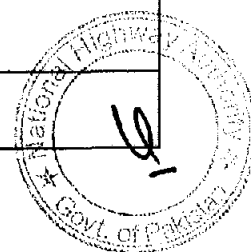


f. Hydraulic Analysis

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 MIKE 11. The hydraulic model will be prepared using GIS techniques like HEC-GeoRAS, WMS or MIKE 11.

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						Check Flood
Functional classification and structure type	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, therefore the consultant is required to submit its proposal and 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.

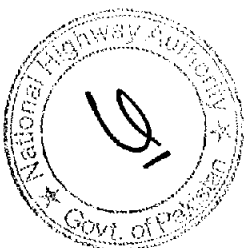
Deliverable:

The Hydrology & Hydraulic Study Report will be submitted by the consultant which must include but not necessarily limited to the following. 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: -

- 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 catchments.
- 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.

3.10. Structural Design

For design of structures, design codes, standards specified in earlier section of the TOR will be followed. Structural calculations of all the structures will be submitted along with supporting drawings in the form of Structural Design Report. The same structural drawings will later on become an integral part of



the tender drawings. report on geometric, pavement, and structural design will be submitted to NHA.

Deliverable: Structural Design Report with detailed calculations and drawings. The report must be self-explanatory in all respects and should contain complete references to relevant parts of Codes and Standards employed. All input files used in Structural Analysis will be made a part of the Report.

3.11. Intelligent Transportation Systems

Given the wide range of intelligent transportation systems, the under stated list is not inclusive of all possible ITS applications, it includes the most prominent ones, which are the focus of this document. ITS applications are grouped within three primary categories:

1. Advance Travelers Information Systems	Real time travel information system
	Route guidance/Navigation system
	Roadside weather information system
	Road user Internet facility
	Radio Channels
2. Advance Transport Management System	Traffic operation centers
	Dynamic Message Signs (or VMS)
	Driving assistance in low visibility
	Accident / Emergency Reporting system. Automatic Incident Detection (AID). The AID enabled cameras will be installed not more than 5 km interval (as per efficient working)
3. ITS Enabled Vehicle Pricing System	Electronic Toll Pricing System

Deliverable: The consultant will actively coordinate with NHA and prepare and accordingly submit an ITS Report. The Report must propose suitable ITS components in the light of best international practices in a way that estimation of costs and quantities thereof is possible so that same can be reflected in the BOQ and Engineer’s Estimates. NHA will share ITS infrastructure drawings (if available) for costing and estimation by the consultant.

3.12. Land Acquisition & Utility Report

The consultant will identify, take photographs and then digitize land, properties, trees, utilities, existing roads etc. falling in the right of way (ROW) to be acquired. Cadastral Maps will be utilized in this regard which are required to be obtained by the Consultant from concerned authorities/departments. NHA will provide the consultant with an *Authority*



Letter in this regard to facilitate acquisition of maps. The consultant will submit ROW plans in the form of GIS Corridor Mapping Report showing the alignment to facilitate timely action for acquisition of land to define the right of way. The Consultant will also prepare estimate for acquiring land and removal/compensation of structures and utilities, particularly in the built up areas.

Deliverable: Land Acquisition & Utilities Folders in the form of GIS Corridor Mapping Report. The report will contain but not limited to geo-referenced photographs along with digitized land, properties to be acquired and estimated cost thereof, utilities to be removed, trees to be removed and their sizes and locations, streams/water bodies and railway lines to be crossed etc. The Report should not only be useful from land acquisition point of view but also beneficial for later monitoring and management of RoW. Land record details with ownership, *mouza*, *khatoni* etc. should be part of the Report.

3.13. Construction Machinery Report

A detailed report on construction resource will be prepared. It will include, based on the construction duration, the amount and type of construction machinery required. Based on the Construction plan developed in Primavera/Microsoft Project, the resource allocation/ the Cash-flow required will be stated. Computations and assumptions for productions will be attached in the report. The cost of any equipment to be imported will be reflected in the foreign currency portions of the cost estimates and PC-I.

Deliverable: Construction Machinery Report.

3.14. Formulation of PC-I

NHA intends to construct this project on BOT basis through Public Private Partnership. The Consultant will formulate the complete PC-I for construction (including VGF) as well as land acquisition and then submit requisite copies thereof which will be reviewed by Planning/PPP Section of NHA and accordingly processed for seeking approval of competent forum.

3.15. Tender Documents

NHA intends to construct this project on BOT basis through Public Private Partnership. This requirement shall be taken into consideration while preparing Tender Documents which should comprise of four volumes. NHA has standardised Volume-I (Part-I) and Volume-II. Consultants will study and adopt these documents after careful scrutiny and modification whereas required. Description of the volumes is as under: -



a. Volume-I

- Instructions to Bidders.
- Conditions of Contract (Part-I) (General Conditions)
- Conditions of Contract (Part-II), (Conditions of Particular Application)
- Conditions of Contract (Part-III), (Supplementary Conditions)
- Forms and Appendices. The consultant will be required to submit complete take-off sheets in soft format for "C" factor along with bidding document.

b. Volume-II

- General Specifications.

c. Volume-III

- Particular Specifications, Special Provisions and Bills of Quantities.

d. Volume-IV

Drawings including at least, but not necessarily limited to, the following details: -

- Title Sheet.
- Sheet Index.
- Key & Location Plan with Co-ordinates and alignment with stationing. Soil investigation linear plan. Pits of soil investigations and geotechnical investigations will also be marked.
- Sheet of Legends & Symbols.
- Traverse, Bench Mark and Design alignment data including curve data.
- Typical Cross-Sections with locations of applications showing Pavement Design for main carriageway, interchanges, and toll plaza approach roads, and road network (if any) within service areas.
- Super-elevation details and Linear Plan.
- Road Furniture Details (Guard rails, Pavement Markings & Traffic signs etc.). Special attention be given to end treatment of guard rails and their junctions with concrete barriers. For Road furniture, location tables. Proposed Location of traffic signs and gantries etc., along the alignment must be shown on the drawings.
- Design of fence to be installed at both sides of project.



- Retaining walls with location tables.
- Intersection Details.
- Drainage plan for surface runoff and urban areas.
- Mass Haul Diagram.
- Updated Plan and Profile Drawings with structure detailing.
- General Notes for Structural Drawings.
- Drawings for Small drainage structures.
- Drawings for Large structures.
- Design of training works for bridges.
- Drawings earth retaining structures.
- Landscaping & Horticulture details as per best international practices and experiences on similar projects.
- Miscellaneous Details/ Ancillary Works including training works.
- Detail drawing folders of Utilities/Infrastructure for Land Acquisition and removal of all utilities/ infrastructure etc., having all the requisite information in the form of GIS corridor maps.
- Roadside Design.
- Design for Lighting as per best international practices but not without tailoring considerations to suit local conditions.
- Highway Drainage design.
- Design of Traffic Control Devices, work zone safety, and preparation of 'Maintenance & Protection of Traffic (MPT) Plans'.
- Consultant will fully define the methodology for construction sequence. Traffic Diversion/Management Plans will be provided in the Tender Drawings 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.
- Intelligent Transportation Systems.
- Design for provision of ducts/crossing of future utilities like OFC, pipelines etc.
- Detailed design of toll plazas, service areas, rest areas etc.



e. **Contract Conditions (Legal Part)**

NHA has prepared Standard Tender Documents sections on instructions to Bidders, Conditions of Contract, Bid Forms etc. and has used them for similar project in the past. Consultant will study these standardised contract conditions and amend them in accordance with the requirements of this project. The Special Conditions of Contract can be added pertaining to the project as supplement to the General Conditions of Contract.

f. **Technical Specifications**

The consultants will study the NHA Specifications and prepare particular specification for the project for specified items not covered in the General Specifications.

g. **Bill of Quantities**

Consultant will prepare comprehensive Bill of Quantities to be calculated to preferable accuracy of $\pm 10\%$ encompassing all the items of work, properly cross-referenced to the Technical Specifications. Standard format of Bill of Quantities will be adopted. BOQ must be submitted along with soft copy of take-off sheets / software files for vetting purposes.

h. **Engineer's Estimate**

Consultant will prepare the Engineer's Estimate of the project based on the project design, drawings and final Bill of Quantities, using latest available 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 complete take-off sheets in soft format along with Engineer's Estimate in order to enable its review/vetting.

3.16. Final Presentation

Consultant at the end of design will make a presentation with following details.

1. Consultant will describe the road alignment, merits, demerits, land acquisition and other impediments (if any).
2. Consultants will highlight important components of project like major bridges, flyovers etc.
3. Important parameters of sub-soil investigation like CBR, Pile Capacity and General Soil Classification etc.



4. Important hydraulic parameters used in the design of bridges over rivers/ canals.
5. Results of traffic study and axle load survey.
6. Location of quarry sites.
7. Consultant will clearly explain the traffic management plans.
8. Complete description of design criteria and functional requirements.
9. Description of specialized equipment and machinery required for the construction.
10. Description of methodology/ codes for pavement and structural design including details of computer models.
11. For Structural Design, summary of results of computer output (especially maximum and minimum forces for all elements) in tabulated form will be presented.
12. A plan showing major quarry sites/ borrow area sites including mass diagram showing cut and full along the finally selected alignment will be presented.
13. Any other points, which the consultant may like to highlight, should be included.

4. **SUBMISSION OF DOCUMENTS**

All the Reports associated with each Task will be submitted as stated in respective sections. In the technical proposal, consultant will develop a Work Programme Task wise with submission dates, in accordance with RFP.

All deliverables will be submitted after necessary quality assurance by the consultant. Each & every page of all submissions made by the consultant must be signed and stamped failing which the document will not be considered for acceptance. All pages and sheets must be properly numbered.

Deliverables may be reviewed by NHA or Design Review Consultant during execution stage. Consultant will give consideration to review comments and observations; however, any review will not absolve the consultant from contractual responsibility for correctness, safety, soundness, and economy of design including Engineer's Estimate.

After finalization of draft submissions in the light of review comments, if any, five (05) hard copies of final version of each deliverable will be submitted to NHA except PC-I for which requisite number of copies will be submitted as per requirement of NHA's Planning Section or Planning Commission. If requested by NHA, Consultant will provide two additional sets of all documents/reports to the Client at a later stage at no extra cost.



05 nos. DVDs containing all documents/ drawings/ reports/ analysis sheets/ software files in soft editable format, properly indexed/ catalogued, will be submitted to NHA. This will be a mandatory requirement failing which contract close-out will remain in abeyance.

5. PERFORMANCE RATING

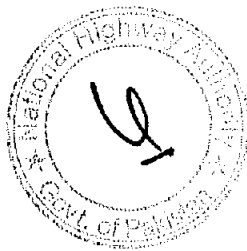
The performance of the consultant may be evaluated by Design and PPP Sections of NHA on basis of multiple factors including but not necessarily limited to quality of submissions, compliance with TOR requirements and instructions of NHA, responsiveness, timeliness, diligence, efficiency, consideration 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 detailed 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. ASSISTANCE IN AUDITS, INQUIRIES, AND LITIGATION

The consultant will be required to assist NHA in addressing the audit observations, inquiries, and litigation at any stage, related to project design, traffic studies, commercial feasibility and bid evaluation/comparative analysis etc.



Part-II (COMMERCIAL FEASIBILITY)



1. INTRODUCTION

The commercial feasibility study must be conducted for the following two scenarios:

- 4-Lane carriageway with 6-Lane structures.
- 6-Lane carriageway.

The construction cost and traffic numbers for both scenarios will enable NHA to decide the basis of Government support requirement, and NHA can decide which one is appropriate to opt.

To address future congestion and bottlenecks on the Motorway, consultant will categorically mention the Level of Service section-wise with respect to timeline, and suggest additional lane requirement accordingly. It is also added that, the consultant will provide necessary coordination and help NHA for conducting ``s for the project.

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:

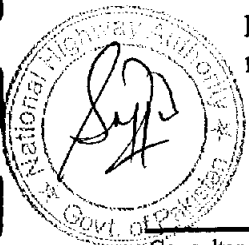
- Kick-off Meetings
- Stakeholder Analysis
- Stakeholder Meeting
- Collection and Review of available Data
- Defining project Need, Objectives and Scope
- Need Analysis
- Analysis of project framework conditions
- Outlining possible financing options
- PPP options identification/analysis
- Project outline: 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 motorways.
- OPEX (Operation Expenditures) Analysis
- Routine and Periodic Maintenance Forecasting
- Toll Level Projections
- Other Sources of Revenues/Cross Subsidization Identification
- Possible Government Support mechanism, options
- Country Economic and Inflation Analysis



- Revenue Analysis & Forecasting
- Identifying other sources of Revenues or Cross Subsidization
- Cross-subsidize Asset Analysis with respect to its design, cost, maintenance & operations etc.
- 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, Hybrid, Cross-subsidization basis
- 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:
 - PC-I (for Land and VGF) *as already stated in Part-I of TOR.*
 - RFP including Model Concession Agreement, with Project Scope (including Intelligent Transportation System (ITS), Service Areas & other features of the Motorway), 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 *with due consideration to cross-subsidization, as stated in Part-I of TOR.*
 - Financial Model
- Presentation (on appointment/ availability)
- Commercial Feasibility - Final Report
- PC-I (Land, Project Cost including VGF) *as already stated in Part-I of TOR.*
- RFP Document including Model Concession Agreement
- Technical Bid Comparative Evaluation Report

5. MODE OF PAYMENT

Sr. No.	DESCRIPTION	Percentage of A*
1.	PART-I: TECHNICAL STUDY	
a.	Design Review Report, Topographic Survey Report	10%
b.	Updated Plan and Profile Drawings with Structure Detailing	15%
c.	Structure Calculations	5%
d.	Traffic Study, Soil Investigation, Geotechnical Reports	5%
e.	Engineers Estimate, BOQ, Quantity Sheets and Cross-Sections	5%
2.	PART-II: COMMERCIAL FEASIBILITY	
a.	Inception/ Outline Report	5%
b.	Commercial Feasibility – Draft Report	5%
c.	Financial Model	10%
d.	Commercial Feasibility - Final Report	15%
e.	PC-I (Land, Project Cost including Viable Gap Funding)	5%
f.	RFP Document including Model Concession Agreement	10%
g.	Technical Bid Comparative Evaluation Report	10%
	TOTAL	100%

* Where A is the Contract Amount excluding the Provisional Sums (if any).



Annexure-I

MINIMUM PERSONNEL PROPOSED BY THE CLIENT

S.No.	Position	Nos.	Months	Person-Months ¹
A. KEY PERSONNEL				
1.	Senior Highway Engineer/ Team Leader	1	4+1	5
2.	Structural Engineers	4	3	12
3.	Hydrologist	1	3	3
4.	Traffic Engineers	2	3	6
5.	Pavement Design Engineer	1	1+1	2
6.	PPP Expert	1	3	3
7.	Financial Expert	1	3	3
8.	Corporate Law Expert	1	2	2
9.	Contract Specialist	1	4	4
10.	Economist	1	1	1
	Sub-Total (A):	14	-	41
B. NON KEY PERSONNEL				
11.	Quantity Surveyors	4	2	8
12.	Chief Surveyor	4	3	12
13.	CAD Operator	6	3	18
	Sub-Total (B):	14	-	38
C. SUPPORT STAFF				
14.	Computer Operators	4	3	12
15.	Office Boys	3	4	12
	Sub-Total (C):	7	-	24
	Total (A + B + C):	35	-	103



¹The proposed person-months are as per Client's assessment; if the consultant has reservation/ opinion/ suggestion regarding proposed person-months it may convey same in writing during Pre-Proposal Meeting or even after Pre-Proposal Meeting but before the last date for seeking clarification, for review and decision of NHA which will be communicated to all the prospective bidders.